

AllThings.Bio PRO

D3.2: Report of the second sequence of focus groups and co-creation workshops including the final concepts for the game design

WP 3 – Engagement for Game Missions

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**AllThings.bioPRO - Game changer for the bio-based economy
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Technical References

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¹ PU = Public

PP = Restricted to other programme participants (including the Commission Services)

RE = Restricted to a group specified by the consortium (including the Commission Services)

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Consortium



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0 Summary

Allthings.bioPRO wants to draw attention to the bioeconomy and its products from renewable raw materials and give citizens the opportunity to contribute their ideas and requirements to shape the industry. For this purpose, the project will co-create a serious game and a smartphone app together with citizens and other stakeholders spanning four different missions: food packaging, fashion and textiles, kids and schools and jobs and careers.

Each of the four game missions is co-developed by two regional project partners¹, local citizen groups and regional economic, research, policy and civil society experts, who are already active in the specific theme of the mission. Thus, the project gives voice to local people and communities. It seeks to strengthen the dialogue for practical opportunities in areas that are important for the region and for specific bioeconomy sectors, and to demonstrate the specific regional benefits while engaging with regional and local stakeholders. By including citizens and putting their perspective to the centre, the project supports the change to a quadruple helix model of stakeholder interaction.

The game development process is organised in two rounds of focus groups and co-creation workshops, followed by co-design meetings. This deliverable reports the stakeholder engagement in the second phase of the co-creative game design development process. The key results are outlined below.

In the second round of focus groups, the stakeholders discussed single game design ideas, which were developed in the first phase of the co-creation and were considered promising by the regional project partners and the game developer. In the end of the events, the groups were able to further reduce the number of games for further development in the final workshop. Additionally, the user requirements from the first co-creation workshops were consolidated. Participants emphasised prioritised user requirements and pointed out those they felt were less necessary.

In the co-creation workshops of the second sequence, the participants further developed selected game designs for their mission with the help of a game design template.

The finalised game designs for the four missions were:

- Food Packaging: Food Packaging Tycoon (manage your own city and produce food for the city); Food Packaging GO! (Collect sustainable/little packaging and handle waste at the right place); Save Flipper (raise Flipper, save it from waste and clean up the oceans)
- Fashion and Textiles: The wardrobe monster (take care of a little monster (Tamagotchi) in your wardrobe by making sustainable fashion choices); The sustainable fashion journey (virtual and real-life journey along sustainable fashion and the life cycle of clothing); My Good Fashion Plan (become the most sustainable fashionista and reduce your fashion footprint)
- Kids and Schools: Bio-Detectives (save the world through environmentally friendly choices)
- Jobs and Careers: Job orientation for future (discover the bioeconomy job world and find your skill set)

The final game designs for each mission are listed in the Annex to this report.

These conceptual designs build the basis for the upcoming co-design of the serious game and the app (Task 3.3, October 2021-August 2022) by the game developer team (WP4) and the workshop participants from the co-creation phase.

¹ For the Kids and Schools mission there is only one regional partner dealing with the co-creation process due to Covid-19 related cancellation of the commitment of AIMV to organise engagement events in their school environment.

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List of Abbreviations and Acronyms

Abbreviation	Definition
AIMV	Aktiv in MV gemeinnützige GmbH (resigned regional partner)
BE	Belgium
BioSC	Bioeconomy Science Center
BSS	Bonn Science Shop (Wissenschaftsladen Bonn e.V.) (WP3 lead and regional partner)
BTG	B.T.G. Biomass Technology Group BV (project partner, content development)
D	Deliverable
DE	Germany
EE	Estonia
FFG	Stichting Fashion for Good
FNR	Fachagentur Nachwachsende Rohstoffe e.V.(project partner, coordinaton)
IBS	Institute of Baltic Studies (project partner, evaluation)
ICONS	Fondazione ICONS (project partner, communication)
INTHUM	Laboratorio Interculturale di Ricerca e di Promozione della Condizione (H)umana (regional partner)
IT	Italy
M	Project Month
MOS	Municipality of Sigmaringen (regional partner)
MS	Milestone
NG	nurogames GmbH (project partner, game development)
NL	Netherlands
NMF	Stichting De Natuur – en Milieufederaties (regional partner)
PU	Publicly available
SE	Sweden
T	Task
TEEC	Tartu Environmental Education Centre (regional partner)
VA	Vetenskap & Allmänhet (regional partner)
WP	Work Package

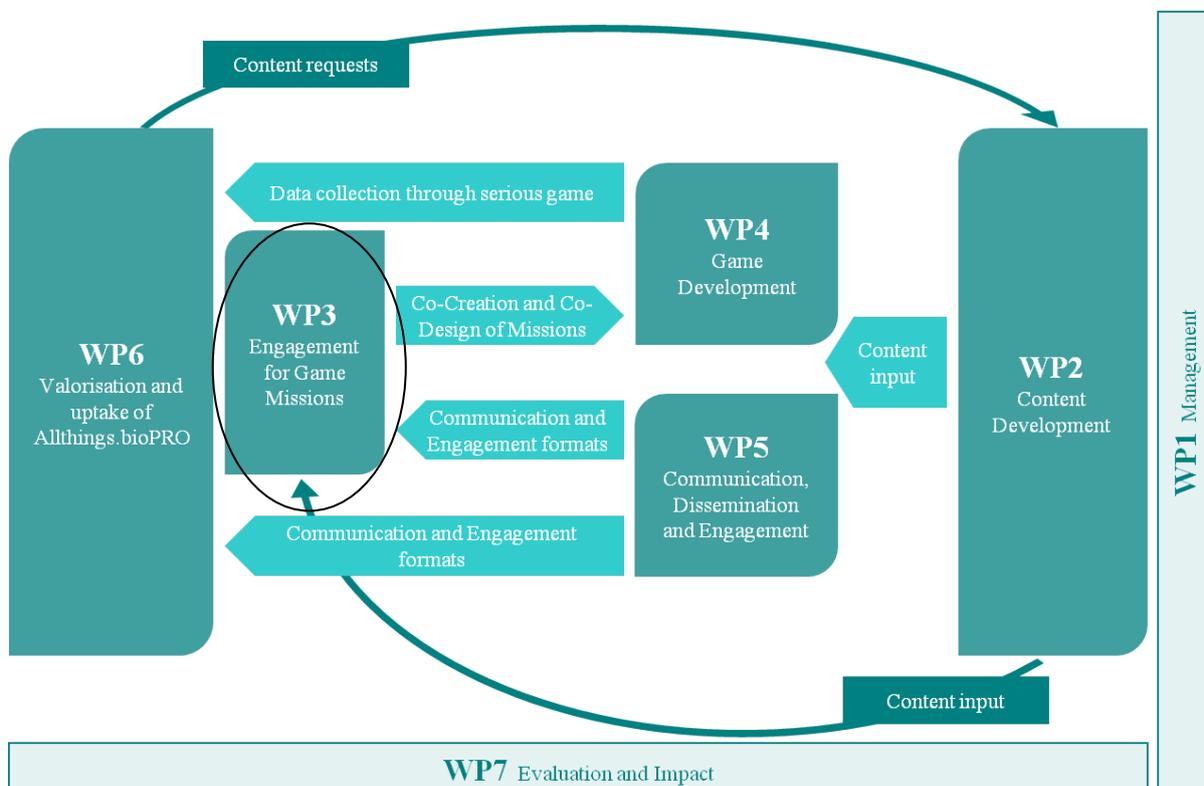
1 Introduction

The overarching objective of Allthings.bioPRO - Game changer for the bio-based economy is to raise awareness, continue communication and at the same time introduce a system of innovative engagement formats to allow citizens to contribute to the bio-based agenda. Specifically, the **project's aims** to:

- Establish methods to foster awareness, participation and co-creation to ensure citizens' feedback and inputs' transfer towards the bio-based industry
- Apply a smart combination of gamification, serious gaming, a mobile app and communication campaign to gather information and data derived by citizens on their ideas and priorities related to specific bioeconomy topics and of direct use for the bio-based industry and the Knowledge Centre for Bioeconomy
- Exploit and further develop the Allthings.bio Platform for bio-based economy communication to the broader public by linking it with the serious game, the smart phone app and a European Bioeconomy Citizen Action Network
- Ensure engagement and uptake of developed results through an early and regular involvement of regional partners and citizens as well as of key bio-based economy stakeholders, policy makers and the Knowledge Centre for Bioeconomy

Graphic 1 introduces the seven Work Packages (WP) in Allthings.bioPRO and shows how **the WPs interact in the project**. As this deliverable D3.2 describes task results of WP3 Engagement for Game Missions, the encircled WP3 box indicates this focus in the graphic. In addition to WP3, this document refers to activities within WP2 Content Development, WP4 Game Development and WP7 Evaluation and Impact.

Graphic 1 –Interaction of Work Packages within Allthings.bioPRO



Source: Own representation

WP3 ‘Engagement for Game Missions’ comprises the engagement process with citizen focus groups, co-creation workshops and co-design meetings leading to the development of the serious game and the smartphone app. The game will address the following themes related to the daily life of citizens, which are the basis for the four different game missions: Food Packaging, Fashion and Textiles, Kids and Schools, Jobs and Careers. Each mission is being co-developed with 2 regional partners (see Table 1) and includes local citizen groups and experts, which are already active in the specific area of the mission.

WP3 is structured in four main tasks:

- Task 3.1 Stakeholder Identification and Mobilisation (M1-3)
- Task 3.2 Co-Creation Phase (M5-13)
- Task 3.3 Co-Design Phase of the serious game (M14-24)
- Task 3.4 Support Services for local partners (M1-36)

Governance in WP3: WP3 is coordinated by BSS. All regional partners carry out the co-creation activities together. **WP3 Partner Meetings** are taking place every month. In these meetings, the regional partners exchange experiences across and within missions and plan successively. Additionally, individual meetings are organised on demand.

Every third month a **HelpDesk Meeting** substitutes the WP3 Partner Meeting. In these meetings, selected helpdesk members from the consortium join the regional partners. This way, WP-overlapping challenges can be addressed effectively.

Helpdesk members are:

- Anne Warnig and Valerie Sartorius (FNR, WP1, WP6)
- John Vos and Jurjen Spekreijse (BTG, WP2)
- Lena Werthmann (NG, WP4)
- Silvia Raimondi and Veronica Meneghello (ICONS, WP5)
- Merit Tatar, Richard Henahan and Andra Asser (IBS, WP7)

This document is a public deliverable (D3.2) related to the task “Co-Creation Phase” (T3.2, M5-13) and more specifically to the subtask T3.2.2, due on 31 October 2021 (M14) in WP3 ‘Engagement for the Game Missions’. The co-creation phase is divided into two sequences of focus groups and co-creation workshops. Seven regional partners conducted the focus groups and co-creation workshops within the four thematic missions in their regions in Europe.

This report is written by Bonn Science Shop (BSS) with the support of all regional partners² and describes the procedure and results of the second sequence of focus groups and co-creation workshops. It also contains the final concepts for the game designs. D3.2 follows on from D3.1 ‘Report of the first sequence of focus groups and co-creation workshops’.

² The document uses the term regional partners and mission partners. Regional partners refers to the (seven) project partners carrying out the co-creation activities across the four missions (food packaging, fashion and textiles, kids and schools, jobs and careers). The term mission partners is used to refer to the two regional partners working on one mission or to refer to the four mission teams.

Table 1 – Regional mission partners

Regional mission partners			
Mission	Regional partner	Abbreviation	Country
Food Packaging	Municipality of Sigmaringen	MOS	DE
	Stichting De Natuur – en Milieufederaties	NMF	NL
Fashion & Textiles	Stichting Fashion for Good	FFG	NL
	Vetenskap & Allmänhet	VA	SE
Kids & Schools	Aktiv in MV gemeinnützige GmbH³	AIMV	DE
	Tartu Environmental Education Centre	TEEC	EE
Jobs and Careers	Bonn Science Shop	BSS	DE
	Laboratorio Interculturale di Ricerca e di Promozione della Condizione (H)umana	INTHUM	IT

The document is structured as follows:

After explaining the link with the first sequence of co-creation activities (reported in detail in D3.1) in Chapter 2, an overview is presented of the second sequence of co-creation activities and the governance structure in Chapter 3. Subsequently, Chapter 4 documents the implementation of the second round of focus groups. Goals, procedure, group compositions and main results (discussion of game design ideas, user requirements) are presented. In Chapter 5 the same is done for the second round of co-creation workshops. The final Chapter presents an outlook on the co-design phase.”

2 Summary of Methods, Main Activities and

Findings in D3.1

The report of the second sequence of focus groups and co-creation workshops including the final draft concepts for the game missions (D3.2) at hand is the follow-up report to D3.1 Report of the first sequence of focus groups and co-creation workshops. Therefore, the missions, methods, main activities and main findings, described in D3.1, build the basis for D3.2, which is why they are summarised here.

The four thematic missions in Allthings.bioPRO:

In Allthings.bioPRO we strive to foster citizens’ awareness, participation and co-creation of the future of bioeconomy through a game development covering the following four “daily life” themes (missions):

Food Packaging: Food is part of everyone’s daily routine. Next to healthy living, animal rights and sustainable food production, sustainable food packaging and waste avoidance and recycling are important. Allthings.bioPRO wants to raise awareness for and familiarise with different types of bio-based packaging on the market and learn about citizens’ views on and needs for bio-based food packaging.

Fashion and Textiles: Clothes and textiles are part of our daily life and fashion is the second most polluting industry globally and known for its poor working conditions. Allthings.bioPRO wants to introduce citizens

³ The mission ‘Kids and Schools’ is only run by one partner because AIMV resigned due to lacking resources in the covid-19 pandemics (see footnote 1). To consolidate the co-creation of game designs in this mission, an additional workshop was organised with a German school class (7th grade) by BSS and FNR.

to sustainable clothing options provided by the bio-based economy and learn about citizens' views on and needs for, bio-based fashion and textiles.

Kids and Schools: The youth has become a strong voice in sustainability discussions in our society. They advocate for a clear stand towards climate change and are influencing adults to change their behaviour. Schools are the places where the youth spend most of their days. In Allthings.bioPRO we want to engage in a discussion on the bioeconomy and sustainable bio-based products to be used in schools.

Jobs and Careers: The bioeconomy is an important contributor to a sustainable and prosperous European Union and needs properly skilled and trained employees. The identification of opportunities to promote careers, education and research activities is on top of the agenda of the European bio-based industry. In Allthings.bioPRO we want to inform about the skills required to consider vocational training and career transition. Our focus will be on highlighting the career opportunities and job profiles that the bioeconomy is looking for.

The Co-Creative Approach:

Allthings.bioPRO engages citizens from the very beginning and throughout the entire co-creative development of the serious game and the smartphone app. Co-creation follows an approach involving different perspectives and collaboratively designed tools, materials, processes, activities or strategies. This working objective concerns building and uniting affected communities in strategic ways and forging new partnerships among stakeholders in the bioeconomy environment and along the value chains. Through regional project partners and local citizen groups and experts who are already active in the mission area, the project gives voice to local people and communities. The purpose of the co-creation activities is to strengthen the dialogue on practical opportunities in areas or sectors that are important for the region as well as for specific bioeconomy sectors, and to demonstrate the specific, regional benefits while engaging with regional and local stakeholders.

Engagement Methods:

In a **focus group** the participants build a small group (ideally 6-10 persons) who are selected according to certain common characteristics that relate to the focus group topic. Moderators, whose task is to keep the group focused on discussing the specific topic, facilitate a focus group. The method helps to learn more about the group preferences, values and opinions regarding the defined topic.

In a **co-creation workshop** the affected stakeholder(s) (groups) are actively and equitably involved in finding better solutions from the very beginning and throughout the whole process. In Allthings.bioPRO actors from (civil) society, policy, research and industry are brought together in co-creation workshops to share their perspectives and ideas on eye level. Together they co-develop concepts for the serious game and the app, which benefit from the multitude of stakeholder expertise. With affected stakeholder groups co-developing the game and the app the likelihood that the outputs meet their needs will be increased and will materialise their visions for a future bio-based economy and the mission topics.

Highlights from the first sequence of citizen focus groups and co-creation workshops:

In the first citizen focus groups, participants discussed their needs, views and attitudes towards bioeconomy and the focus missions. The discussions were kick-started by exploring participants' first associations with the topic.

Among others, it became evident that

- Levels of understanding and attitudes differ across and within the focus groups
- Some participants knew about the latest developments and materials, others dealt with bioeconomy for the first time
- For many participants, it was unclear what the terms 'bioeconomy' or 'bio-based' really mean. They detected it to be somehow sustainable
- The complexity of the topic was repeatedly stressed
- Overall, bioeconomy was understood as utilisation and economisation of plant-based, renewable resources
- Participants frequently connected it with circular economy and reusability, waste reduction, a green way of thinking and nature-friendly behaviour, holistic thinking, innovation, technology and future

- While some participants were clearly positive about the opportunities that bioeconomy brings for achieving sustainability, fostering progress and safeguarding jobs, other participants took more critical positions

For the co-creation workshop, experts in bioeconomy and the respective mission topic from science, industry, politics or civil society joined the citizens as participants. The core element of this workshop was to brainstorm on first basic game design ideas, while considering possible ‘players’ and their user requirements. Some selected game design ideas to be further discussed and perhaps advanced were “free Flipper from plastic waste”, “organise a sustainable fashion show”, Pokémon Go bioeconomy edition for children and a coaching game for job seekers to develop their personal qualifications for a bioeconomy career.

Assessment of interim results from the co-creation activities:

Between the two sequences of engagement events, the game and app design developer nurogames GmbH (NG, WP4 lead) compiled and commented on the developed user requirements and game designs from the first co-creation workshops. The assessment was presented to the regional partners, which gave them a better sense of what to consider in game design and which questions to ask to facilitate the way towards successful game designs. The consortium selected promising ideas generated within their mission to give these into the second round of co-creation activities.

Process reflection and evaluation and outlook for the second sequence:

The regional partners reflected on the co-creation process and on the main findings from the co-creation events with the help of a moderator self-reflection survey provided by WP7 Evaluation and Impact as well as in meetings in and across their mission teams. Here, some major points regarding the co-creation process are summarised:

- The project is understood as a living body, which is filled with life by all contributing parties and evolves over time, is interconnected with the context and gets shaped by it
- The co-creation events were enjoyable for the participants and the results of the meetings were both creative and informative
- Creating feedback loops between WP3 moderators and participants were helpful for the participants and helped confirm their suggestions were accurately recorded.
- Due to the covid-19 pandemics the consortium was not able to meet in person, which hampered the team building as well as the development of a shared project vision
- The shift to online formats increased the participation rate of (high level) experts and citizens from different regions of the partner countries.
- All regional partners reported enthusiasm and intrinsic motivation to contribute despite the online interaction.
- Timing is a challenge for online co-creation. All regional partners advanced their facilitation skills in online co-creation.

The regional partners considered the following points **important for the second sequence of co-creation activities:**

- Regional partners indicated the need for long-term planning and common templates to harmonise the process. Simultaneously, openness, adaptation and process orientation remain important principles
- Goal-seeking loops with co-creation participants should be maintained
- Reduce the data volume produced and discuss and advance selected game ideas pointedly
- Close collaboration within and across missions is crucial for the success of the project

3 Overview of the Second Sequence of Co-Creation

Activities

The co-creation phase in Allthings.bioPRO is at the centre of WP3 ‘Engagement for Game Missions’ and takes place between month 3 and 13 (November 2021 – September 2021). It is described in Task 3.2 Co-Creation Phase, more specifically T3.2.1 and T3.2.2. The aim of the co-creation phase is to develop comprehensive concepts for the implementation of each game mission, which will be picked up by the game development partner Nurogames GmbH (NG) to design the game in WP4.

The co-creation phase in Allthings.bioPRO is structured in two sequences of focus groups and co-creation workshops on four topics, called ‘missions’: Food Packaging, Fashion and Textiles, Kids and Schools and Jobs and Careers. Each sequence includes two focus groups and two co-creation workshops for each of the four missions (1 of each per regional partner). An overview of the first sequence of the co-creation phase can be found in D3.1 (chapter 6, p. 10). This deliverable (D3.2) reports the activities during the second sequence including the co-created final draft concepts for the game mission. The second sequence took place between June and September 2021. The co-creation activities in the four missions were conducted in seven regions across Europe. The activities in the missions Food Packaging, Fashion and Textiles and Jobs and Careers were organised by two partners each. The mission Kids and Schools is an exception, run by only one partner. An additional workshop was organised in Germany to complement the results of this mission.

Initially, the focus groups and co-creation workshops were planned to be run as in-person events. Due to the pandemic, all focus groups except for the one in the mission Kids and Schools had to be held online.

Table 2 shows the co-creation activities chronologically. Activities shown in grey font belong to the first sequence of the co-creation phase (reported in D3.1) and to the co-design phase ahead.

Table 2 – Overview of the Engagement Framework

	Co-Creation Phase (Jan-Sep 21)						Co-Design Phase (Oct 21-Aug 22)
Events	1 st Focus Groups	2 nd Co-Creation Workshops	Review of Sequence 1	2 nd Focus Groups	2 nd Co-Creation Workshops	Merging of game designs	1 st Co-Design Meetings
Activities	Familiarise with bioeconomy & mission topic; understand participants’ perspectives.	Empathise with targeted user groups, develop user requirements; brainstorm basic game design ideas.	Set up of technical & functional requirements; review and select user requirements & game design ideas.	Discuss mission topic, approach and game design ideas from round 1; finalise user requirements.	Advance selected game design ideas.	Merge game designs from both mission partners.	First versions of the developed game will be shared and discussed with co-creation stakeholders for feedback and steering purposes.
Time	Jan-Feb 21	Mar-April 21	May 21	Jun-Aug 21	Aug-Sep 21	Sep 21	Oct 21- Aug 22

4 Second Round of Focus Groups

The focus groups in the second sequence were conducted between June and July 2021.

The focus group design was proposed by BSS and NG and discussed and adapted by all regional partners.

Due to the pandemic, all focus groups except for the one in the mission Kids and Schools were held online. They were facilitated and moderated by the regional partner organisations. Usually, the focus groups were supported with visual tools (Miro, Mentimeter etc.).

Each of the focus groups consisted of 6-12 participants and lasted between 1.5 and 3.5 hours.

The following sections describe the focus groups' compositions, goals and procedure and the main discussion results.

4.1 Focus Group Participants

Table 3 - Focus Group Participants

Focus Group Participants						
Mission Partner	Country	Nr	Age range	Female	Male	Participant features
Food Packaging						
MOS ⁴	DE	-	-	-	-	-
NMF	NL	10	18-55	7	3	8 citizens: one citizen was also working for a municipality on the theme of sustainability. The other citizens were a mix of experienced gamers with an interest for sustainability and non-gamers, more focused on the contribution they could make by joining the co-creation process. 2 experts: one researcher on bio-plastics and packaging from a knowledge institute and one from a garbage collector.
Fashion and Textiles						
VA	SE	5	<30-50	1	4	4 citizens: 3 with background in communication/journalism and a musician 1 expert: researcher
FFG	NL	12	14-60	12	0	9 citizens: with regular interest in sustainable fashion 3 experts: (had) followed a fashion related study, but none currently worked in the field.
Kids and Schools						
TEEC	EE	7	12-14, 35	4	2	6 citizens: 6 pupils from Tartu Nature House 1 expert: teacher from Tartu Nature House
Jobs and Careers						
BSS	DE	12	22-50	8	4	5 citizens: citizens in the phase of initial career orientation (bioeconomy students and graduates from other studies (e.g. ecotrophology)); citizen in the phase of career re-orientation, formerly worked in

⁴ Unfortunately, no second focus group could take place with this regional partner. This was due to too few registrations plus time constraints. MOS tried to reschedule the focus group twice (with increased mobilisation efforts), but the participant rate did not get any better. Eventually, MOS had to go over to conduct the co-creation workshop to not harm the synchronised co-creation process across the missions.

						(sustainable) fashion 7 experts: 5 experts from science and academia (transformation research to bioeconomy, political processes of bioeconomy between economy and ecology, coordinator of a bioeconomy summer school, serious game about sustainable agriculture, education coordinator at BioSC, participation and co-creation at Fraunhofer ISI); one expert from business (on vocational training in the Chamber of Commerce and Industry) and one expert from civil society (on sustainable lifestyles).
INTHUM	IT	8	19-56	6	2	6 citizens: one high school student (Agricultural Technical Institute), one photographer, one architect with passion for video games, one musician for video games soundtracks, one psychologist with passion for video games 3 experts: one exponent of the non-profit sector (expert in environmental policies), one computer expert with passion for gamification and one graphic designer

4.1.1 Reflection on the Composition of the Focus Groups

Ratio of citizens and experts: The organisers aimed to achieve at least 50 per cent citizen participation in each focus group. That has succeeded in all groups except the German group on Jobs and Careers. Here, it was difficult to mobilise young adults in the phase of job orientation, whereas it was easier to mobilise experts. The reason for this may lie in a personal invitation of the experts instead of impersonal invitations of citizens via social media groups, portals, mailing lists etc.

Quadruple helix stakeholder balance: Among the experts it was much easier to mobilise representatives from science and academia or civil society than from business, industry and policy. The reason for this could be a high intrinsic motivation, the normality of volunteer work and more flexible working structures of these experts working in science and academia or for NGOs.

Gender balance: In five out of six focus groups there was a surplus of women. The reason for this is not apparent, since the same number of women and men were approached.

Age range: All age groups were represented in all focus groups (except the Kids and Schools group due to its target group) and almost all focus groups were well balanced regarding the age criteria. As mentioned before, the German focus group on Jobs and Careers lacked youth participants below 20 in their initial phase of job-orientation.

Education: Among the experts it was predictable that their education level does not represent the average education in the regions. But also among the citizen participants there was a surplus of academics. There may be several reasons for this: the academic background of the organisers may have made it more likely to approach academics and use communication channels, which rather reach academics; academics may pay attention to research and innovation projects and may deal with the concept of bioeconomy more often explicitly. For many citizens bioeconomy is in some way part of their daily life (professional connection, consumption habits) without them knowing the term bioeconomy.

4.2 Goals and Procedure

The goal of the second round of online focus groups was to discuss (and advance) a pre-selection of promising mission design ideas and to consolidate the user requirements with the participants. All focus groups except the one in the mission Kids and Schools were conducted online.

Table 3 shows an example agenda of a focus group. An outline of the common procedure follows:

- Before the event, factsheets about the bioeconomy and the mission topics (developed by WP2), a project presentation (developed by WP5) and informed consents were sent to the participants. New participants were asked to fill in the baseline survey.
- The moderators started the focus groups welcoming the participants, supporting to remove possible technical issues and explaining the event's goal.
- Participants were informed about the data security and data usage in Allthings.bioPRO again and the facilitators secured that they had received signed declarations of consent from all participants. Consent was obtained to record the meeting.
- Afterwards the basic principles of the used platform (Zoom, Webex and others) were explained. Other tools were explained right before deploying them (e.g., Mentimeter, Miro).
- Then, participants introduced themselves and got to know each other better. For this, different opener methodologies were used.
- The facilitators briefly presented the project as well as the game design ideas for their missions, which were chosen within the consortium after the end of the first sequence of co-creation activities. A small Q&A session followed.
- A moderated group discussion on the selected game design ideas followed. Guiding questions were formulated based on the game developer's queries and tips for the specific game design ideas derived from the review event in the end of the first sequence (see D3.1). These discussions aimed at getting first feedback from the participants as well as further ideas on how to advance the designs. In many groups the discussions were visualised on digital whiteboards (e.g., Miro, Conceptboard).
- After a short break, the most important as well as debatable user requirements were discussed.
- The focus group ended with a summary and a reflection of the focus group. The event finished with a closer to keep the event and the discussed content in mind (e.g., bioeconomy alphabet) (see D3.4 for methodologies). Eventually, the facilitators gave an outlook on the upcoming co-creation workshop and thanked the participants.

Table 4 - Example of a Focus Group

Example of a Typical Focus Group Agenda
Welcome and goals
Data security and IT & Tools
Get to know each other
Project presentation
Presentation of pre-selected game ideas
Discussion and advancement of pre-selected game ideas
Break
Consolidation of user requirements
Summary and reflection
Closing

4.3 Summaries of Results

This section presents a list of basic game ideas obtained from the first co-creation sequence and discussed in the second round of focus groups. Subsequently, the processes and findings of the group discussions are outlined.

4.3.1 Pre-selected Basic Game Ideas

Table 5 shows the game ideas for each mission, which were discussed in the focus groups. These ideas were developed in the first co-creation workshops of the first sequence and considered promising by the regional project partners and the game developer.

Table 5 – Pre-selected game design ideas from the first sequence of events

Pre-selected game design ideas from the first sequence of events					
Name	Genre	Target group	Concept	Goal	Nurogames' Comments
Food Packaging					
Packaging Tycoon	Construction strategy business simulation	14+	Product Tycoon, essentially the player aims to make the business sustainable, but it is becoming increasingly difficult the more sustainable the business becomes.	Create a product	Unique selling point is missing, consider social impacts as well, precise definition of target group
Rescue Flipper	Action	Occasional players	Clickable rubbish, which can be removed by puzzles or mini games. When removing the rubbish, a fact is displayed about the type of rubbish, e.g., about its degradation time, recycling rate etc.	Free Flipper the dolphin from the rubbish before the shark comes (time pressure)	Good idea and scope, what is the fun part? Possibilities to lengthen game? What are puzzles/minigames? How can players progress?
Food Packaging GO!	AR	Children and teenagers	Collect food packaging in AR (similar to Pokémon), when the player's bag is full, the packaging can be recycled at stations and points can be earned. The player has to feed a creature, which can be upgraded.	Eat and recycle	Mix of Pokémon and Tamagotchi, big idea, what is minimum? Add more "variables", Minigames? Interaction? What is the fun part?
From shed to sheet	Simulation	People who regularly go to recycling centres	The player owns a shed with lots of materials, incl. recycling bins. The player has to tidy up the shed (in the most sustainable way). Simultaneously, the player needs to create a pigeon loft but is not allowed to use other materials than the existing ones.	Ensure a sustainable and circular product by properly recycling and reusing products in the shed.	Interesting idea with a good target group and scope, create user journey
Fashion and Textiles					
Fashion Show Game	Dress up game	Citizens who are interested in sustainable fashion	Plan a sustainable fashion show; use less material or recycled ones.	Get as many points as possible	Good basic idea, good scope, test if it fits the target group or if the idea has to be altered, how to implement multiplayer/social

					functions?
Sustainable Fashion Journey	Adventure/casual	18-35 years, Amsterdam residents, interested in sustainability	A journey on sustainable choices, earning points by performing good behaviour and see impact in the app. Examples for tasks are “don’t buy clothes for 3 months.”	Earn points, reach the end of the journey	Modern idea, look for unique selling points, trackers as support, limit to Amsterdam needed? Game needs a narrative
Sustainable Fashion Journey	Adventure/Action	12-50, female	The player can travel to different ‘worlds’ from his/her own city. E.g., s.o. from Amsterdam ‘travels’ to the cotton fields in Myanmar to learn how her fashion is made after completing a task (grow something Tamagotchi-wise, choose between different ways of farming etc.). The player can move to the next material or production step in the game.	Discover the journey of your garment	Could be a good idea if it is mobile – utilising GPS? Clear goal and narrative needed, why female target group? Good scope
Kids and Schools					
Bio-Detectives	Adventure	School kids	The player has to perform day quests (e.g., take photos) to build up equipment and earn points for his/her character and other in-game awards.	Build up good equipment, learn about bioeconomy	Very basic idea, what is the unique selling point? What is the fun part? Add real mechanics
Jobs and Careers					
Find your skillset with the help of AI	Mini-games Puzzles, Simulation social, Open world	Digital natives entering the job market	AI helps the player to build his/her skill set and a professional CV by solving tasks. Bioeconomy jobs and sectors are presented.	Build your CV, find your dream job	Narrow down the scope, if you have one day, which functions would you add? Focus on an AI companion that helps the player to see what she/he is good at, how to strengthen the community building aspect?
Decide what you want to do/3-Week Challenge	Quizzes, puzzles	Digital natives entering the job market with first experiences, interested in bioeconomy	The player has to solve quizzes with social/emotional questions (“does this job suit my interests and skills?”), similar to ‘Find your skillset with the help of a mentor’	Find out if a job in the bioeconomy suits you.	Could be combined with the first mission idea, good scope, focus on 3-weeks challenge and give ideas for every week/day, create interesting narrative, how to strengthen community building aspect?

4.3.3 Process Descriptions and Group Discussions Results

4.3.2.1 Food Packaging

NMF

Process description: This Dutch focus group started with discussing the steps that NMF and the whole consortium had taken between the previous co-creation workshop and this focus group, namely the sorting of the developed user requirements and the assessment of game design ideas.

Afterwards, two doubtful user requirements were discussed in more detail with the group: online or offline game? And playing with or without an account and a log in? (See further details in the section about user requirements below).

Next, the moderators presented the four remaining game design ideas for the mission Food Packaging (see Table 5) and made the participants discuss those ideas and the feedback provided by the game developer NG in breakout rooms. Four of the citizens in the group pitched the game design ideas to the plenum. Then, all voted on the game design ideas that should be worked on further.

The group created mood boards for the three remaining game ideas. Mood boards are important means for design and communication ends. They represent the mood the product aims to communicate with the help of graphics, photos, drawings or short texts.

MOS

Unfortunately, no second focus group could take place with this regional partner. This was due to too few registrations plus time constraints. MOS tried to reschedule the focus group twice (with increased mobilisation efforts), but the participant rate did not get any better. Close to the deadline, MOS had to organise the second co-creation workshop right away to deliver the game designs to their mission partner NMF and the game developer NG in time. This was needed to ensure a timely start of the game development process in WP4. Nevertheless, the discussions about the game designs took place in MOS second co-creation workshop and are captured in MOS final game designs.

Results:

- The Dutch group decided to eliminate “From shed to sheet”, mainly due to the lack of technical feasibility and participants could not really imagine the game to be fun

4.3.2.2 Fashion and Textiles

FFG

Process description: Two promising game ideas – one from the workshop of each mission partner – were used as starting points for the discussions (see Table 5).

Every participant was asked to write down for themselves what they liked best about each idea, what they thought to be the weakest spot and what they would add. These comments were shared within the group and used as input for discussions in breakout groups. From the two ideas discussed, an idea, which combined bits from both ideas, emerged. The focus group finished with voting on the ideas and determining the next steps.

Results:

- The participants remained a bit concerned about the complexity of the topic and the challenge to translate it into a (small) game

Idea 1: Fashion Show Game

- Goal: The concrete and scoped goal of the fashion show was liked by the group, especially with a point system
- Target group: Even the youngest participants (14 years old) assessed a fashion show as too childish, which suggests a younger target group for this idea
- Social: the group rated multiplayer and social options as appropriate to reach as many people as possible
- Content: being able to read (and value) tags or materials was named desirable

Idea 2: Sustainable Fashion Journey

- Narrative: the sustainable journey could be represented by the journey of one's personal closet. Different tasks could be divided in categories or drawers/compartments in the virtual closet
- Personal not local: the group suggested to make the journey a personal instead of local and to not limit it to single regions
- Photos of personal garments could be uploaded to learn about their sustainability and receive suggestions for better choices/imaginary closet where favourite sustainable items could be picked online
- Time limited: a journey limited in time could motivate people to play the game (e.g. 8-week transformation of one's closet and learn new habits)
- Collective action: Collective starting moments where players can inspire other friends to join might motivate

Mix of ideas: An idea, which combined bits from both ideas, was to make a fashion journey connected to the personal wardrobe. The player can share challenges and earn points.

VA

Process description: The organisers presented all five selected game ideas with accompanying comments from the game developer NG and three personas that were developed in previous workshops (see D3.1). Via the workshop tool Miro, the group discussed and narrowed down the game ideas to two and developed them further.

After discussing the game ideas, the focus group looked through the user requirements, edited by NG, and discussed what they thought was most important and what was less important. The user requirements are listed at the end of this section.

The event concluded with a presentation of the timeline of the game's further development to the participants.

Results:**Idea 1: The wardrobe monster:**

- Genre: Adventure
- Goal: build a more sustainable wardrobe
- Target group: 11-30 years old
- Concept: The player needs to take care of a monster (Tamagotchi) in her/his wardrobe. Making different sustainable choices of products/things for the personal wardrobe affects the Tamagotchi's mood and the earth's climate. The player is faced with various challenges related to sustainability & bioeconomy through the choices she/he makes in relation to the monster, and she/he competes with others in the game for the most environmentally friendly and sustainable wardrobe/monster/world

Idea 2: Sustainable Fashion Journey

- Genre: Augmented reality, place-based serious game
- Target group: 20-40 years old
- Goal: Collect points and win against others as you learn about sustainable textiles and bioeconomy related fashion

- Concept: The player makes a sustainability journey in the game and in real life. In the game: The player partly is in a virtual world (avatar). The player can follow the textile production stage from cotton cultivation in Myanmar to the factory in Sri Lanka to the fashion store in Strängnäs (Sweden). The player is also faced with various questions about sustainability that affect her/his score that can turn into cryptocurrency in real life. In real life: A kind of digital marketplace where the player can exchange and sell products, scan different product codes to see how durable they are and collect points. The player can get points if she/he has not bought new clothes in X months - checklist of what players can do in real life. The player will become an expert in sustainable fashion and gets questions about different choices to earn points and be able to increase her/his prestige. There is the opportunity to share with friends
- Platform: mobile

4.3.2.3 Kids and Schools

TEEC

Process description: The second focus group took place in person. The focus was to discuss and advance the game idea from the first co-creation workshop. In groups, the children developed two different game ideas out of the one from the last event (see Table 5). These were discussed in more detail. Drawings accompanied the idea development (see Annex).

Afterwards, the kids emphasised important user requirements. These can be found in the section on user requirements below.

The focus group ended with summarising the day and discussing next steps.

Results:

- **Idea 1:** The player wanders around a game map and can zoom into different worlds to learn about different environmentally friendly solutions and products by solving different tasks or day quests
-
- **Idea 2:** The player comes across different creatures (good and bad). The player must turn the bad ones into good creatures by making sustainable choices. Bad creatures consist of fossil resources and good ones are bio-based
- The children also developed different game assignments (different difficulty levels and final assignments)
 - Examples for assignments are
 - Memory game
 - True or false quizzes
 - Build with bio-based materials
 - Save animals
 - Learn about eco-labels
 - Make changes in the monster's house to make it environmentally friendly
 - The monster is throwing packaging waste at the player, and she/he must catch and sort it

4.3.3.4 Jobs and Careers

INTHUM

Process description: First, important user requirements were stressed (listed below).

Then, the participants were introduced to two selected game ideas, which were developed in previous workshops (see Table 5). The participants elaborated on them by creating similar but in some way different ideas.

The focus group was concluded by thinking about a game idea that, through a fair labour market, saves the world.

Results:

- **Idea 1:** The market is a world of challenges, dangers and opportunities and the player must decide what she/he wants to do. The player can get a feeling if she/he is looking for employers, which suit her/his qualities and interests by checking the characteristics they ask for. Aptitude tests can be taken. Alternatively, the player can examine if she/he can imagine becoming an entrepreneur and creating an ideal work team.
- **Idea 2:** The player creates a personal CV according to the challenges and opportunities that arise during the game
 - A discussion about the mutability of a CV, depending on time, job position, and objective to express oneself arose
- A multiplayer mode could be included in both ideas
- Importance of a game's fantasy dimension to "escape from reality" and imagine oneself differently
- Importance of the playful aspect in a game
- Ability to choose to think about one's real future or to create an avatar different from the player
- If the game is to support building a personal CV, the challenges confronted with must be real-life challenges

BSS

Process description: The German group followed up on the first focus group by revisiting the topic of jobs and careers in the bioeconomy. This allowed for a more in-depth look at the topic.

In addition, the organisers presented the main personas to the participants to clarify the target group but also to assess the estimated fit with reality. Afterwards the two pre-selected game ideas (see Table 5) were discussed. The moderators did not ask the participants about important user requirements explicitly, but rather extracted them implicitly from the discussions. The user requirements can be found in the end of this section.

The group ended with a short summary of the topics discussed and a flashlight to reflect on the event.

Results:

The following points of the group discussion were already stressed in previous events and are therefore highly relevant:

- Bioeconomy crosses very different professional branches, therefore offering professions for people with a wide range of interests and qualifications
- Bioeconomy offers many professions for "low-skilled workers", many traditional professions, similar qualifications for traditional and "new" professions
- Meaningful professions in the bioeconomy, societal contribution
- SMEs need perspective in the bioeconomy, not only corporations
- Ambiguity of the term "bioeconomy", careful communication of concept and (dis)advantages

New discussion points were:

- Many research projects about bioeconomy, many funding opportunities as drivers
- Majority of bioeconomy workers is not aware that their profession is counted as part of the bioeconomy – awareness raising important
- Bioeconomy needs generalists as well as specialists, need to bring together both perspectives; interdisciplinarity as driver
- Questionable if market is yet ready for transdisciplinarity
- Jobs and careers in the bioeconomy and sustainability as cross-cutting issues, parallels
- "THE" bioeconomy and "THE" bioeconomist do not exist
- Many bioeconomy studies exist but it is still a research topic – commercialisation and jobs uncertain
- constructive criticism about the focus on academics and the missing diversity in educational qualifications. Also, due to the fact that a big share of the professions in the bioeconomy are traditional jobs

In the discussion about the two pre-selected game ideas from previous workshops, the following topics were discussed:

Idea 1: Find your skillset with the help of a mentor

- Virtual day placements give concrete insights in the everyday working life, chance for “less outstanding” graduates
- Real experts/comic characters show/report workplace, can replace day placements, characters need to be diverse!
- Thematic evenings
- Include previous experiences and networks of users
- Users who found a job can become alumni and stay part of the network

Idea 2: 3-week challenge:

- Day quests difficult, daily play cannot be expected
- Coaching especially interesting for non-academics, due to aggravated career start
- Week 1: employer advertises job position, users need to apply
- Week 2: what are my strengths/weaknesses? Self and external assessment in “camps”, try it yourself, insights into everyday working life (video chat, podcast etc.); employer X has problem Y – find a solution (together)
- Week 3: search employers, organisations, networks (key word search)

Both:

- Reduce complexity
- Sims as inspiration for moderation
- CV template, branch-specific

Important key words in this focus group

- Diversity (!) of jobseekers and professions
- Teamwork/connection
- Inter- and transdisciplinarity
- Research topic, financial promotion of bioeconomy

User Requirements:

User requirements are formulated by the target users to indicate their expectations of the final game. The user requirements are based on all regional focus groups across all mission themes. The consolidated list can be found in D4.1 Allthings.bioPRO Game Design Document.

- Shape your character
- Enable teampay, challenge friends
- Share success
- Address diverse users, consider different learning (visual, practical etc.) and gaming types (competition. Cooperation etc.)
- Reduce complexity
- Target group-oriented communication
- Motivation factor
- Reward system
- Learning effect
- Variable play time, individualised options
- Play with a personal account
- Playing online would be preferable, but the possibility to play it offline would be great as well
- Playing without an account should be possible
- Non-linearity
- Connectable to the player’s location (log ins, tags etc.)

- Playable anywhere
- Entertainment purpose as primary goal
- Play in a real world, no fable character
- Connect to regional special events, e.g., World Earth Day

5 Second Round of Co-Creation Workshops

The second round of co-creation workshops was conducted between July and September 2021. The workshops were facilitated and moderated by the regional partner organisations.

The concept for the co-creation workshops was co-developed by BSS and NG (WP4) with the support of all regional partners. Involving the game and app design developer NG in defining the desired output formats ensured that critical elements were considered along the way. Thus, WP4 could also pick up the co-created results effectively. Although the overall format and the desired outputs of the workshops were pre-defined, it was the clear goal to remain open and responsive throughout the process and not drive the participants' ideas into certain directions or limit their creativity.

The following sections describe the workshops' compositions, goals and procedures, results and follow-up work.

5.1 Co-Creation Workshop Participants

For the co-creation workshop, the participants from the previous events were invited again. In many regional focus groups not all of them confirmed, so new participants were mobilised as well. This was not the case for the mission Kids and Schools.

The group sizes varied between five and 15 participants and the workshops lasted between 2 and 4 hours.

Table 6 gives an overview about the group compositions.

Table 6 – Participants of the second Co-Creation Workshops

Participants of the second Co-Creation Workshops						
Mission Partner	Country	Nr	Age range	Female	Male	Participant features
Food Packaging						
MOS	DE	5	26-64	2	3	3 citizens: student in Sustainability Management, retired chemist, citizen interested in vegan nutrition and waste (reduction) 2 experts: person working in a Sustainable Packaging Institute, division manager at the public utility company and gamer
NMF	NL	8	<30 - <50	6	2	7 citizens: one citizen was also working for a municipality on the theme of sustainability. The rest of the citizens were a mix of experienced gamers with

						an interest for sustainability and non-gamers, more focused on the contribution they could make by joining the co-creation process. 1 expert: researcher on bioplastics and packaging from a knowledge institute
VA	SE	5	13-16	4	1	5 citizens: 5 upper secondary school students; 2 were gamers 0 experts
FFG	NL	5	21-32	5	0	3 citizens: participants showed regular interest in the topic, one had previous experience in app (user experience) design 2 experts: working in sustainable fashion
TEEC	EE	8	12-14, 35	6	2	8 citizens: 7 pupils from Tartu Nature House and one teacher from Tartu Nature House
BSS & FNR⁵	DE	15	12-14, 32	8	7	15 citizens: 14 7 th grade pupils and their teacher at a comprehensive school in Siegen, North Rhine-Westphalia
BSS	DE	8	23-55	4	4	5 citizens: 4 students in the phase of career orientation and one citizen in the phase of career re-orientation, who formerly worked in (sustainable) fashion 3 experts: one representative of the Chamber of Industry and Commerce with focus on matching and educational projects, one representative of a bio job portal, one representative of a student job portal
INTHUM	IT	7	19-56	3	4	3 citizens: one high school student (Agricultural Technical Institute), one psychologist (with passion for video games) and one educator 4 experts: one expert in environmental policies, one representative of the third sector, one computer expert (with passion for gamification), one graphic designer

⁵ The mission 'Kids and Schools' is run by only one partner (TEEC). To consolidate the co-creation of game designs in this mission, an additional workshop was organised with a German school class (7th grade) by BSS and FNR.

5.1.1 Reflection on the Composition of the Co-Creation Workshops

Ratio of citizens and experts: The organisers aimed to achieve at least 50 per cent citizen participation in each co-creation workshop. That has succeeded in all groups. But in the Dutch Food Packaging workshop, the Swedish Fashion and Textiles workshop and both Kids and Schools workshop, there was a clear surplus of citizens. Only for Kids and Schools workshops this was decided in advance. NMF and VA reported difficulties to mobilise experts, especially without foreseen project budgets for incentives/reimbursements.

Gender balance: In 50 per cent of the focus groups there was a surplus of women. The reason for this is not apparent, since the same number of women and men were approached.

Age range: The two groups in Kids and Schools were not aimed at being age balanced due to the target group. In both Fashion and Textiles co-creation workshops participants were youth or young adults. Here, the well-balanced age range in the second focus groups could not be maintained. Fashion seems to be of special interest for younger people. The other co-creation workshop groups were well balanced in age, but again, the German group for Jobs and Careers did not contain any young adults below 20 in the phase of career-orientation.

Education: Among the experts it was predictable that their education level does not represent the average education in the regions. But also among the citizen participants there was a surplus of academics. There may be several reasons for this: the academic background of the organisers may have made it more likely to approach academics and use communication channels, which rather reach academics; academics may pay attention to research and innovation projects and may deal with the concept of bioeconomy more often explicitly. For many citizens bioeconomy is in some way part of their daily life (professional connection, consumption habits) without them knowing the term bioeconomy.

5.2 Goals and Procedure

The goal of the second round of co-creation workshops was to bring together citizens and experts on different topics related to bioeconomy and/or the mission topic to advance and finalise the selected game designs.

The exemplary agenda in Table 7 below gives an overview of the exemplary procedure of the second co-creation workshop.

An outline of the average procedure follows:

- Before the event, factsheets about the bioeconomy and the mission topics (developed by WP2), a project presentation (developed by WP5) and informed consents were sent to the participants. New participants were asked to fill in the baseline survey.
- The moderators opened the co-creation workshops welcoming the participants, supporting to remove possible technical issues and explaining the event's goal.
 - Participants were informed about the data security and data usage in Allthings.bioPRO again and the facilitators ensured that they had received signed declarations of consent from all participants. Consent was obtained to record the meeting.
 - Afterwards the basic principles of the used platform (Zoom, Webex and others) were explained. Other tools were explained right before deploying them (e.g., Mentimeter, Miro).
 - Then, participants introduced themselves and got to know each other better. For this, different opener methodologies were used.
 - Afterwards, the facilitators presented Allthings.bioPRO as well as the respective mission topic from a European perspective. The selected game design ideas, already discussed in the previous focus group, were introduced. A small Q&A session followed.

- The game design(s) were advanced along the structure of a game design document template provided by the game developer team (see final game designs in the Annex) provided by the game developer NG.
- The workshop ended with a reflection. Eventually, the facilitators gave an outlook on the upcoming co-design phase and thanked the participants.

Table 7 – Example of a Co-Creation Workshop Agenda

Example Co-Creation Workshop Agenda⁶
Welcome and goals
Data security and IT & tools
Get to know each other
Presentation of Allthings.bioPRO and selected game design idea(s)
Advancement of the game design I
Break
Advancement of the game design II
Reflection and Closing

5.3 Final Concepts for the Game Missions

In the co-creation workshops, participants advanced the game designs along the structure of a game design template, provided by the game developer team NG. The template is included in the Annex.

While name, genre, target group, goal, concept, narrative and platform were determined in the first round of co-creation workshops (nevertheless open for revisions in the second workshop), participants outlined the following elements in the second co-creation workshops:

- Gameplay
 - Objectives
- Mechanics
- Story, Setting and Character
- Levels
- Control System
- Audio, music, sound effects
- Technical
 - Target Hardware
 - Network Requirements
- Game Art – Key assets, how they are being developed, intended style

After conducting the co-creation workshops, the regional partners merged the game designs within their missions and delivered them to the game developer team. These merged final drafts of the game designs for each mission will be the basis for the co-design phase of the game. The full final drafts can be found in the Annex to this report.

In Table 8 short descriptions of the game designs are given for each mission.

⁶ This is an exemplary agenda. There were small differences in the processes.

Table 8 – Final Game Designs

Final Game Designs		
Mission theme	Game Name	Short Description
Food Packaging	Food Packaging Tycoon	Manage your own city and produce food for the city
	Food Packaging GO!	Collect sustainable and little packaging and handle waste at the right place
	Rescue Flipper	Raise Flipper, save it from waste and clean up the oceans
	Microby	Feed a microbe with waste
Fashion and Textiles	The wardrobe monster	Take care of a little monster in your wardrobe by making sustainable fashion choices
	The sustainable fashion journey	Make a virtual and real-life journey along sustainable fashion and the life cycle of clothing
	My Good Fashion Plan	Become the most sustainable fashionista and reduce your fashion footprint
Kids and Schools	Bio-Detectives	Save the world through environmentally friendly choices
Jobs and Careers	BiOrientation / Jobs for future	Discover the bioeconomy job world and find your skill set

5 Follow-up and Outlook

Table 9 – Follow-up and Outlook

Follow-up and Outlook	
Date	Description of Activities
September 2021	<p>The Co-Creation Phase concluded with the second co-creation workshops and the handover of the final game designs for each mission.</p> <p>The moderators filled in self-reflection surveys after every co-creation event (set up by IBS (WP7)) and a follow-up study was sent to all citizen participants who participated in one or more co-creation activities (also set up by IBS (WP7)). The follow-up study aimed to make participants reflect on their experience with the co-creative activities and to assess whether their knowledge about bioeconomy has increased compared to before (for comparison, a baseline survey was conducted among participants at the start of the process). The feedback helps IBS to evaluate the effectiveness of these activities and the progress of the project, and provide helpful information for game development.</p>
October 2021 – August 2022	<p>Co-Design Phase: The co-creation participants and the game developer NG will implement the co-created game designs. During the game development process, different game versions will be shared with the four co-design groups (one co-design group per mission with participants from the co-creation activities of both regional partners running the mission) for feedback</p>

	and steering processes.
27 October 2021; November 2021; April – May 2022	Engagement will take place in a first version presentation meeting (October 2021) and two co-design meetings (November 2021 and April-May 2022). In these meetings, major progress will be discussed. NG will present the status of the game development; show preliminary results and possible solutions for ideas developed in the co-creation phase. The citizens and experts are invited to comment on the results and make further suggestions for improvements. The virtual meetings will be organised by BSS, supported by the regional partners and in close cooperation with NG.
August 2022	The results of this co-design process will be reported in D3.3 by BSS with support of all regional partners.
October 2022	The results of the follow-up study will be reported in D7.2 Evaluation of stakeholder involvement process

Annex

Annex Structure

Annex I: Game Design Template

Annex II: Final Game Designs

- Food Packaging
- Fashion and Textiles
- Kids and Schools
- Jobs and Careers

Annex I: Game Design Template

Name	The name of the game
Genre	The genre – You can also make up genres and mix them together: “A first-person-shooter with adventure influences” is a valid genre. Example Genres are: Shooter Simulation Action Adventure Puzzle Point’n’Click Sidescroller Sports ...
Target Audience	Your target audience can be defined by their demographics (age, gender, geography, language, occupation).
Concept	The basic idea of the game in maximal two sentences.

1 Gameplay and Mechanics

This section will define the most important part of the game: How to play it!

1.1. Gameplay

What is being played?

1.1.1. Objectives

What are the objectives of the game? What does the player want to accomplish?

1.2. Mechanics

How is it being played?

What are the rules to the game, both implicit and explicit. This is the model of the universe that the game works under. Think of it as a simulation of a world, how do all the pieces interact? This actually can be a very large section.

2 Story, Setting and Character

Why do we play? This part is optional! Games like Tetris don't have a story at all.

2.1 Story and Narrative

Includes back story, plot elements and game progression.

2.2 Game World

Outside of the story you want to tell: How does the world look?

2.3 Characters

Each character should include the back story, personality, appearance, animations, abilities, relevance to the story and relationship to other characters

3 Levels

Does the game have levels? How do you reach the next level? – This part is also optional

List up the levels – Each level should have a short synopsis, an objective, and, if applicable, what part of the story happens here and how (e.g. with a cut scene in the beginning?)

Depending on the game, this may include the physical description of the map, the critical path that the player needs to take, and what encounters are important or incidental.

4 Control System

How does the game player control the game? What does he/she use for input? (e.g. Mouse, Keyboard, Controller, or input methods on your mobile phone: Swiping, tapping etc...)

5 Audio, music, sound effects

How is the soundscape of the game?

6 Technical

Technical questions

6.1 Target Hardware

Desktop PC or mobile?

6.2 Network requirements

If you plan a game where multiple people join, please note everything here (How many people play together? Do they each need one device or do they share it? How does the multiplayer work?)

7 Game Art – Key assets, how they are being developed. Intended style.

Here, you can also look up images from the internet to show which style you envision for the game. You can even make a Moodboard on your own.

Annex II: Final Game Designs

Food Packaging

Game Design 1: Food Packaging Tycoon

Target group:

The game is aimed at young people between the ages of 12 -30, who are already somewhat interested in climate (change) and technology to combat climate change.

Gameplay

What do you do during the game?

You manage your own city, and you produce food for the city. Making sustainable choices makes your city better, but "wrong" choices are punished.

What are the goals of the game?

To supply a city with food, by means of factories/recyclers, but the environment (CO2 and waste) and availability of raw materials must be taken into account, otherwise the city will perish (slowly; e.g., waste or floods flow through the city, forest fires or other climate related disasters appear or no more raw materials causing the supply to stop). Here, striving for closed loops (loops between factories/laboratories/recyclers) and an ultimately sustainable product is the solution to a happy city :) Close chains; let them come back as packaging? Creating the most sustainable product. Putting sustainable choices in a more positive light, if you don't make sustainable choices your business will go down the drain. City building game, be ruler of a city.

What does the player want to achieve?

To make the whole food chain sustainable, through creation of different sustainable products.

What are the rules?

You emit CO2 through production if you produce too much CO2 the CO2 level rises if it reaches a certain level and increases the chance of natural disasters in your city (lots of rain, flooding, forest fires). You also have to think about the packaging you apply. If it is not recyclable, the amount of waste in the city increases. By making sustainable choices (use bio-based raw materials that you can unlock through upgrades, start a recycling business, only use wind energy, make sure you reuse the raw materials for new packaging etc.) you can either prevent the problem from occurring or bring back a level that is not too high. Still, the production must be kept going to make sure your city stays happy (not producing is not an option, because then the city goes hungry).

Story / Character

Why do you play?

Because you want a very clean, sustainable city with happy well-fed residents.

What is the main character's backstory?

As there is not really a character, we chose to answer these questions. A disaster is about to happen. You inherit a factory and a town where the town is in bad shape (or you are asked by the mayor to help). The inhabitants eat unhealthy food (are sick and overweight), the city is polluted as waste piles up and climate change is imminent due to too high CO2 levels. You have the chance to improve the city by providing healthy food, clean production and proper circular waste disposal.

How does the character develop in the game?

The city is dirty, with bulging trash cans, hungry people. As you make better choices, the city gets cleaner, people happier.

What does the environment/world look like?

There is a polluted city (which you will make cleaner) and an abandoned industrial area (where you will build/upgrade factories and such).

Are there any other characters?

Small dolls in the city (they walk around and you can see if they feel good via emoticons). Little scientists and factory staff walking around (exclamation point emoticons appear for information).

How is the relationship of those characters to the main character?

The player's choices affect the puppets.

Levels**How do you reach the next level? What is the goal?**

There are not really levels, but you pay with happiness points (hp). Which you obtain by feeding the people, by having a beautiful city. You get them by clicking on the heads of the happy inhabitants and gathering them in the happiness bar. This happiness bar slowly increases until the end. When it reaches the end you level up. This bar slowly increases per level because you have to upgrade for more happiness points. The happiness points count as experience points/progression for the bar, and the happiness points can also be spent for the upgrades. (The points are not lost at the progression bar) The upgrades list how many hp you still need to get a certain upgrade. (Such as new solar panels, cleaner machine, waste coaches in the city who help residents to separate waste properly). Which part of the story takes place in which level? What are the similarities and differences between the different levels? What encounters do you have towards the end of a level? Which ones are important and which ones are more extra?

Operation / Control System**How does the player control the game?**

You control the game by clicking on the screen with your fingers.

How many buttons or ways of controlling the game do you need?

You can switch between your factory and your city by swiping between two screens.

Technology**On which device is the game played?**

Mobile/tablet.

Is it a multiplayer game?

No.

Are you playing it on the same device or different devices (online or local)?

Same device.

Audio / Music**What music is included with the game?**

Normal background music, not too overwhelming when the city is in a good state. When a climate disaster is about to occur, the music can become a bit more ominous.

What other audio effects?

Level up sound.

Sound when you launch a product.

Game Design 2: Food Packaging GO!

Target group

The game is aimed at a wide audience; both young people aged between 12 and 30, and young parents who want to enjoy going outside with their children for an educational walk. The popularity of Pokemon GO has taught us that adults in their 40s and 50s also like to get out and about with their smartphones in order to keep moving and be entertained.

Gameplay

What do you do during the game?

You are a character who walks around in the real world, but sees augmented reality with it. You buy food because you're hungry (fuel gauge) OR because you're taking on challenges, and through this you indirectly collect the packages that contain the food. You put these in your backpack. At a certain moment, your backpack is full and you have to hand in your packages at the right place. Handing it in could be done in a mini-game. You have influence on the choices you make in type of packaging or even no packaging. Picking up litter is a side-quest.

What are the goals of the game? What does the player want to achieve?

2 goals: Making choices in the types of packaging (1) (or preferably no packaging at all) and handing in the waste at the right place (2). You find out which materials are better when recycling. (+ how do you know what kind of plastic it is then? How to make it not too complicated, but also not too superficial). 1: There are different types of challenges (situations or events) that you can encounter, for example: you have to do shopping for an event where people come to eat, or you have to clean up the mess of a festival, or you have to choose the best of the local offerings within a certain time or other limit. 2: Mini-game: Have to drag trash out of your backpack under time pressure to the right trash can? With mixed packs this is much more difficult than having e.g. all paper bags. Not clear yet if this mini-game is also in augmented reality or that you can do this at home on the couch by swiping)

What are the rules?

There is a form of time pressure, a level lasts a certain time (day, week?) and/or there is a limit (money or volume of your backpack). Other than that, the game is very free. You can do challenges (together with people), or go out on your own.

Story / Character

Why do you play?

Character building, challenging others, working together, levels up (?), learning about packaging (intrinsic goal: to save the world).

What is the background story of the main character?

N/A.

How does the character develop in the game?

You can choose different starting characters. Appearance is customizable so you can identify with it. How do we make it visual when you level up? Bigger backpack, medals, different outfits.

What does the environment/world look like?

Augmented reality, so the world as it is with animated elements of food and packaging.

Are there any other characters?

People who are also playing it. Possibly, there are also 'bad guys (bots)' who actually spread litter.

What is the relationship of those characters to the main character?

The 'bad guys' are characters controlled by computers. Those are the antagonists. There are also other people you can work with.

Levels**How do you reach the next level?**

What is the goal? A new quest can be a new level. The next level is a kind of upgrade to your character. For example, a bigger backpack or a different outfit or a medal. (You always play against equivalent opponents?).

Which part of the story takes place in which level?

You start at stores with a lot of packaging (Jumbo, etc.) and then at a certain point you can go to better, packaging-free stores (Ekoplaza) or carry your own reusable packaging.

What are the similarities and differences between the different levels?

N/A.

What encounters do you have towards the end of a level?

Which ones are important and which ones are more extra?

Operation / Controls**How does the player control the game?**

Touch. And literally walking with GPS. How many buttons or ways of control do you need? Walking and the mini-games are two different ways of control.

Technology**On what device is the game played?**

Smartphone

Is it a multiplayer game?

Yes, you will meet others. You can improve other players' high scores in mini-games.

Do you play it on the same device or different devices (online or local)?

Online, everyone plays on his or her own phone.

Audio / Music**What music is included with the game?**

Background music

What other audio effects?

When picking up litter

When picking up and throwing away packaging

Level up

When encountering other players

Game Design 3: Rescue Flipper

Name: Rescue Flipper, Clean the Ocean Up!, Swimming rubbish, Click rubbish away

Genre: Action game, Click game

Target Audience:

Free time Players, in short time windows. The game is aimed at a wide audience; both young people aged between 12 and 30. The popularity of candy crash has taught us that adults in their 40s and 50s also like to play short games with their smartphones.

Goals of the game

Rescue Flipper
Clean the oceans up
Less waste in the sea-
Learning about alternative products instead of fossil plastics
Collect x rubbish in y time

Mechanics

You play the different seas in the history of mankind e.g. 1920 –today. Younger times more rubbish than before and maybe also the type of rubbish. Levelling the character leads to cosmetic or game mechanics upgrades (fewer clicks, protective shield, etc.)

-Level summary: How could the garbage have been prevented? What influence on e.g. CO2 footprint etc.-
Levels with unlock other characters

Mini-games Ideas:

Mini-game 1: The more difficult it is to degrade the waste, the more clicks required e.g. cardboard 1 click, plastic 5 clicks. Trash is refilled (from above like Tetris)

Mini-game 2: Avoiding the garbage while swimming in the sea (e.g. by tilting the mobile phone to the left and right).

Mini-game 3: Have rubbish removed by swapping (similar to candy crush).

Settings and Characters

Marine litter over time (1800-2021)

-Character (Flipper) grows and gets stronger and can remove more plastics from the ocean

Story

Development of the life of the dolphin (baby -adult)

Maybe a campaign (trip around the world), different oceans

Game world

Start in a coral reef-than discover the oceans-Later also e.g. oil rigs, sunken freighters-Example of the oceans (other garbage ideas)

Characters

Flipper a dolphin

Level system with different marine animals

Create a team (swarm) to achieve team achievements together

Who throws the garbage in the sea? (Freighter, people?)

Levels

Level heavier due to the type of waste e.g. dismantling time-If you dodge, the garbage comes faster-
Reaching the level by number removing garbage-through achievements

Control Systems

Swipe and click-Tilt left and right

Audio, music and sound effects

The sound of the sea-rustling plastic

Technical

Mobile version (Android and Ios)-Internet connection (cloud-save)

Game Art - Most Important Assets, How Are They Developed? Intentional style

Trash brown, gray black, or e.g., bordered in red, nuclear waste glowing-blue-turquoise-different oceans-2019-09-25-Müll-im-Meer-Zentralbibliothek-Copyright-Marco-Care-Greenpeace-Schildkröte_small.jpg (800×536) (klimawoche.de)-https://www.nabu.de/imperia/md/nabu/images/umwelt/abfall/meer/141209-nabu-reifen_meer_steve-spring_marine-photobank-680.jpegMoodboard:

Miroboard:https://miro.com/app/board/o9J_IHOnOYE=/https://miro.com/welcomeonboard/SEk0NzVZa3VSWFI2bmdONzByaUtRUDZnMUVIQUtmQk51VW53SDNFS2RzOHRXcUxnYkVsMWQxUkk3QnNiS0kzVHwzMDc0NDU3MzU3OTc2MzY4NzI4?invite_link_id=990386715295

Game Design 4: Mikröbchen (before Biopack to go)**Name:**

- Recycle your life
- Feed me with plastic
- Plastic hunger
- Microbe eating diary

Genre:

-Adventure-augmented-Reality games-location-based-click and swipe

Target Audience:

The game is aimed at a wide audience; at young people aged between 12 and 30. Aims at daily gamers, because the microbe needs food every day.

Goals of the game:

Feed the microbe with waste

Mechanics

- "Garbage animal" Ideonella sakaiensis 201-F6 has to be fed with garbage that can be found in reality-different materials can be processed more easily and more difficulty
- Levelling the character leads to cosmetic or game mechanics upgrades (fewer clicks, protective shield, etc.)
- Level summary: How could the garbage have been prevented? What influence on e.g. CO2 footprint etc.
- Levels with unlock other characters

Characters

Main character: microbe "Garbage animal" Ideonella sakaiensis 201-F6-microbe can have different looks.

Story

- Throw trash in Microbial's mouth
- Learn about different types of garbage
- Ideonella sakaiensis 201-F6

Which plastic do they like? 16 Most publications are on PET (polyethylene terephthalate)

This year, however, enzymes from bovine stomachs that can break down some petrochemical-based plastics were also found

Game world

Real life-game works with the camera like Pokémon Go.

Characters

Microbe

Level system with different styles-Create a team (swarm) to achieve team achievements together.

Microbes (as character creation (personalization) based on spore?)

Levels

- When you see the garbage, animation of the "garbage animal" eating it away
- Hunger and life bars -recycling more unfriendly, less refilling but some damage, good recyclable = filling up a lot of hunger, but no damage
- Bio-based etc. Favored and positive and plastic etc. to be avoided
- How is the material recognized? Queries (paper or foil, then hard, soft ...) or scan etc.
- AR: Simulate a waste detection, If not recognized -> directly into the combustion
- Animation when there is a lot of combustion -> smog-Highscore, show how long the animal lives
- Learn new skills through level ups (new types of garbage, faster or more)

Mini-game:

-Idea 1: Garbage animals ask for certain garbage e.g. I want paper etc.

-Idea 2: If the camera can't recognize the rubbish there are questions: e.g., is the plastic soft or hard --> it is stuck to something else; 2-3 questions for the category or: Can --> Magnetic or not

Control Systems

- Swipe and click
- Tilt left and right-the rubbish is thrown down the animal's throat with the finger

Audio, music and sound effects

- Eating sounds
- In the case of poorly degradable material, digestive noises-rustling plastic

Technics

-Mobile version (Android and Ios)-Internet connection (cloud-save)

Game Art -Most Important Assets, How Are They Developed? Intentional style.

-<https://shop.heidelbaer.de/Mehr-vom-Heidelberger-Spieleverlag/Ursuppe-DEUTSCH.ht>

<https://www.bing.com/images/search?q=sorgenfresser&form=HDRSC2&first=1&tsc=ImageHoverTitle>

Fashion and Textiles

Game Design 5: My Good Fashion Plan

Name	My Good Fashion Plan
Genre	Adventure Puzzle Point'n'Click Interactive
Target Audience	English, International, 15-40, Male and Female, into fashion and/or sustainability, all backgrounds - anyone that owns a smartphone
Concept	Become the most sustainable fashionista by levelling up through collecting tips and actions, completing them and sharing them with your friends. It's an inspiring and motivating, interactive app to gain knowledge. A first person learning journey with stories, quizzes and challenges that includes a community to share milestones and challenges with.

Gameplay and Mechanics

Mechanics

The backbone of the game are the Good Fashion Action Points. You can either choose a pre-defined action plan, or create your own order. Behind each action point there are links, video's and tips to achieve the action. There is room for the players to share their own experiences and tips to each other, where the ones with the most upvotes are seen first (maybe you receive additional points for this). There is also a share/invite button to share your actions with your friends or on social media. Some examples:

Action	Points	Additional info
Know before you buy. Get to know your favourite brand by visiting their website or reading their corporate responsibility report, where they share information on their social and environmental commitments.	1	Good On You [Resource] — This mobile app provides ethical ratings for over 2,000 fashion brands based on their impact on people, the planet and animals.
Check your label. What are your clothes made of? Each material has a different impact and a product made from 100% of the same material is generally easier to recycle.	1	
Look out for certifications and standards. Labels like Cradle to Cradle Certified™, Global Organic Textile Standard (GOTS), Fairtrade®, OEKO-TEX® and others can signal better practices.	2	Sustainability Certification Guide [Article] - A handy overview of the most popular sustainability certifications and standards compiled by Apparel Entrepreneurship.

Go organic. If you are buying cotton or a natural fibre, choose the organic option. Organic fibres are better for biodiversity since toxic chemicals are not used in their production.	3	-video of organic cotton farmers -yes/no quiz on the differences with regular
Ask questions. If you can't find the sustainability information you're looking for, ask a salesperson or message the brand by email or social media. Your question might start an internal conversation.	2	
Become a borrower. Need something new? Try renting — especially for special occasions, if you're pregnant or if you have growing kids. You can save up to 37,000 litres of water annually.	2	
Buy nothing new for X days. Did you know that the world now consumes more than 100 billion new pieces of clothing every year? That is 2 times more than just 15 years ago! For the next month, pledge to not buy any new clothes.	3	
Create your own - plastic free - washing detergents	2	- Recipes - Influencer experiences
Paint your old/stained clothes using natural dyes	3	- A filter that lets you try different colours
Change your washing habits	2	- Full loads, lower temperatures, air-dry etc.

Story, Setting and Character

Nvt

Game World

The further you come in the game, the more beautiful and fashionable it gets.

Characters

Nvt

Control System

Swiping and tapping/clicking

Audio, music, sound effects

Except for the video's there is no sound. There might be a rewarding happy tune each time you accomplish an action.

Technical

Target Hardware

Mobile

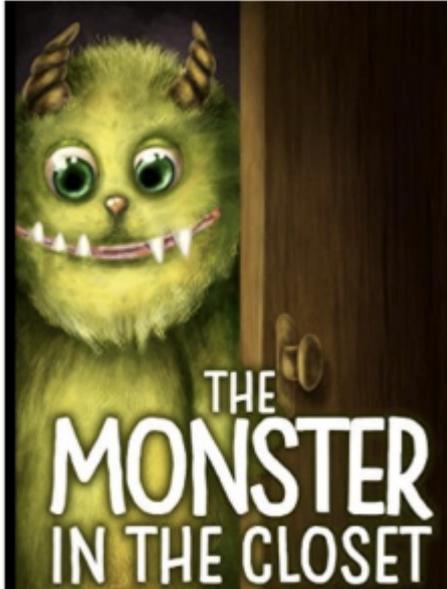
Network requirements

each one needs their own device.

Game Art – Key assets, how they are being developed. Intended style.

It's arty, happy, flowy and motivating. Bright natural colours. No negative/aggressive language but positive things that motivate me to do better.

Game Design 6: The wardrobe monster



Genre:

A serious game with adventures. Tamagotchi inspired.

Target Audience:

European 11-30 year old –fashion conscious to some extent. Want to learn more about what you can do.

Goal:

Build a More Sustainable Wardrobe

Concept:

You have a monster in your wardrobe that you must take care of like a "Tamagotchi" -by making different sustainable choices of products / things for your wardrobe, this affects the mood and climate on earth we live on. You are faced with various challenges related to sustainability & bioeconomy through the choices you make in relation to your monster, and you compete with others in the game for the most environmentally friendly and sustainable wardrobe/monster/world.

Platform:

Mobile phone.

Game play:

You have a monster in the closet that you should take care of like a "Tamagotchi" by making different sustainable choices of products / things for your wardrobe affects this mood and the climate on earth we live on.

You are faced with various challenges related to sustainability /the climate through the choices you make for your monster in the wardrobe and you compete with others in the game for the most environmentally friendly and sustainable monster.

You can make the monster bigger or smaller through your choices. There is no right or wrong but it affects.

Story and Character:

You want to live as sustainably and environmentally friendly as possible. What can you do yourself? Learn about Sustainable textiles and fashion while you get points when you learn and make sustainable choices.

Show how sustainable your wardrobe is from the beginning. What can you change in what choices you can make? How sustainable are other players, your friends? How does your wardrobe affect the world? IRL and in the game.

Also address mental illness and young people's climate anxiety linked to the monster in the closet. Humanity in this fantasy world is not well and they have created a dystopia by consuming the earth's resources. Now you will change this through your avatar by making sustainable choices and meet challenges where you lead the world into a thriving and blooming fantasy world. A fantasy world that once was a utopia but which has become a dystopia with the bad choices of humanity. Dark and gloomy but fabulous.

The monster in the closet can be "mother nature" that swells up and can explode. She should be happy and not become a monster. You can choose to be an avatar-male / female or non-binary. You should take care of "mother nature" so she does not become a monster in the closet. Make a "Banger" intro video about how the world can go to hell and how to make a change to the better as a backstory.

The choices and challenges in the game must be real and have examples from the real world. Companies - organizations can provide input, different fashion labels -so you feel that what you do can affect. Simulations from reality.

Levels:

Yes, after a certain number of challenges and choices, you get to the next level. And the "monster" in the wardrobe develops/changes. "You now need new shoes for the wardrobe... .x number of choices." Or "You now need to go to the Nobel party, what are you wearing?" It may be that you should buy gifts for others (as sustainable as possible). New stores opens with different dilemmas and challenges or family members emerge to interact etc.

Control System:

Swipe, and tap the screen.

Technical:

Mobile game -you should be able to sit on the bus and do it. Mute if you want... Sound should not be that important.

Game World - mood board:



Game

World-mood

board: Pictures: https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.disneyplus.com%2Fmovies%2Ftim-burtons-the-nightmare-before-christmas%2F5GjwOj5Rkpz2&psig=AOvVaw3ansQ_zC7QE9AawhRLQdp7&ust=1631627209265000&source=images&cd=vfe&ved=0CAwQjhxqFwoTCLit5pOL_PICFQAAAAAdAAAAABAE20210911https://store.steampowered.com/app/493540/Figment/20210911https://moana.fandom.com/wiki/Te_Fiti20210911

Game Design 7: The Sustainable Fashion Journey

Genre:

Augmented reality, place based serious game.

Target Audience:

European citizens 20-40 years old –fashion conscious to some extent. Want to learn more about what you can do.

Goal:

Collect points and win against others as you learn about sustainable textiles and bioeconomy related fashion.

Concept:

You make a sustainability journey IRL and in the game. Make a sustainability fashion journey to learn more about sustainability and bioeconomy at the same time as you become an expert and earn points, compete so you can win against the others.

Platform:

Mobile phone

You make a sustainability journey IRL and in the game.

In the game: You are partly in a virtual world with an avatar. You can follow the textile production from cotton cultivation in Myanmar to the factory in Sri Lanka to the fashion store in Strängnäs. You are also faced with various questions about sustainability that affect your score that can turn into cryptocurrency IRL.

IRL: A kind of digital marketplace (Facebook) where you can exchange and sell products, scan different product codes to see how durable they are and collect points. You also get points if you have not bought new clothes in x months IRL -checklist of what you can do IRL.

You will become an expert in Sustainable Fashion and get questions about different choices to earn points and be able to increase your prestige. Opportunity to share with friends.

You can make a difference in your everyday life and influence others to do the same.

Story and Narrative:

What is sustainable fashion and bioeconomy and how can you influence yourself and others for a better world?

Characters:

In the game you are a character/avatar, but it is the "education" and what you do IRL that matters. The goal for the avatar is to become an expert in Sustainable Fashion and Bioeconomics. Therefore, it needs to go on study trips, educate itself and learn as it goes.

A SIMSlike-"real world" for your Avatar. Everything you choose, type of transport, products for your avatar, how you travel in the game, have questions and Quizzes you need to make choices about bioeconomy and sustainability. Where you earn points and maybe cryptocurrency IRL.

Levels

Harder and harder challenges, quizzes, but also rehearsal and the ability to make choices where there are no right or wrong. You also get access to more and more features the more points and maybe more cryptocurrency IRL you get. Which companies /organizations IRL might provide or get voucher. Mobile game where you get messages IRL for quizzes and challenges.

MOODboard:



Picture: SIMS <https://global.techradar.com/sv-se/news/nasta-expansion-till-sims-4-kan-bjuda-pa-nagot-helt-nytt-2&memegenerator.net-210913>

Kids and Schools

Game Design 8: Bio-Detectives

Name	BIO-DETECTIVES
Genre	It is mostly an adventure game, but the in-game tasks differ and may include different mini-games with different genres.
Target Audience	Kids 10-14
Concept	The player(s) have to travel back in time to save the world, because humans have destroyed the world. You wander around the game-map and learn about how biobased products are better choices for the environment. You collect points / equipment/ prizes when you solve different tasks/day quests.

Gameplay and Mechanics

Objectives:

Player has to save the world - humans have used up all resources and you travel back in time to change the decisions, which have lead to the destruction of the world.

To save the world the player has to learn about environmentally friendly choices, bio-economy and solve different tasks/levels. Players have to play through the levels and collect points.

The goal is to make the world a better place by replacing petrol-cased products with biobased and consuming less.

The player has to decide which other characters in the game are good or bad. And guess how you can turn bad creatures into good ones (replace a petrol-based plastic creature with biobased material)

Mechanics:

/The mechanics of the game is integrated in other parts of the document/
See table of tasks in "Levels"

Story, Setting and Character

Story and Narrative

The kids pictured different narratives:

Narrative 1:

Polluting/over consumerism has turned different products/objects evil because humans do not care about them anymore (abundance society) and/or have thrown them into nature. Now they are angry and want revenge.

The main character finds an old watch while sorting waste. With this watch one can travel back and forth in time. The player travels in time to change the thinking and behaviour of the humans to save the world.

Narrative 2:

A sad endangered being is worried about the survival of its species and about the preservation of the planet. To save its family and friends and the planet, it helps others to understand the consequences of their thinking patterns and behaviours, to make better choices and clean up the world. The main enemy is a villain who uses garbage to rule the world and who turns landfills into monsters. These monsters have to be defeated.

Narrative 3:

A blob was forced to leave its home planet Earth because of the garbage monster (polluted planet) and travel to another planet. But life on this planet is not easy, either. It is small and dangerous (living conditions for the blob are not fulfilled). The blob and his/her friends decide to go back to the Earth (with a spaceship) and save it. When they arrive everything is destroyed.

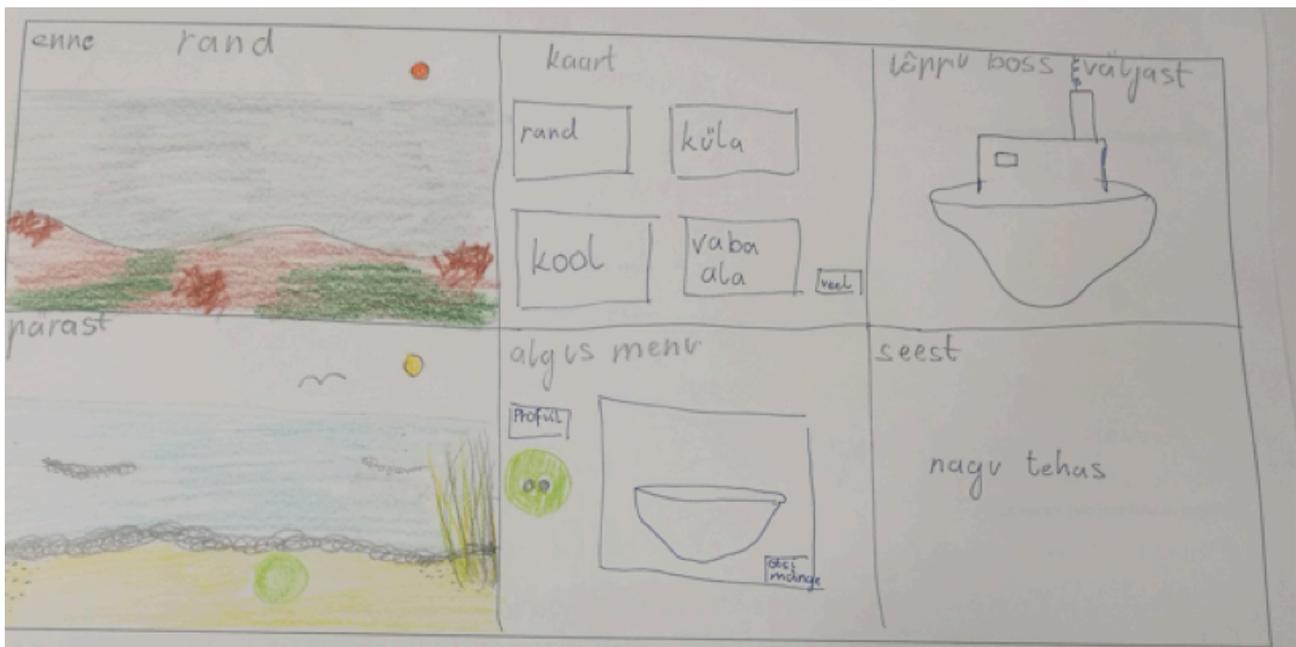
Bad characters (e.g. plastic bags, single use products, cigarette butts, petrol spills etc., polluting factories) have taken over the world and must be defeated.

But the bad characters do not know or understand themselves that their actions are not environmentally friendly. Blob and his/her friends (good characters: bio-based products/renewable resources) have to help them to understand how to be better.

Game World:

The children drew different game worlds.

After choosing the character and starting the game, the player has a map on the mobile screen. And he/she can enter into different “game worlds” / “game islands”.





Here the children pictured that the game world is planet earth - 5000 years ago, 100 years ago and today. And the green-yellow-red colours show what areas are in trouble. So the player can choose which part of the planet to save. The picture below shows that the character moves around the continents by boat, plane or on foot.





Caves (world)
 Cottages (- “-)
 Mountains (...)
 Stone world
 Vulcans
 Cities/Villages (villages could be attacked)
 Jungle
 Forests
 Desert
 Fields
 Highly modern world
 Dust
 Dungeons (Castles with monsters)

End season: rainy weather
 Victory: sun
 Different worlds (lava world, forest world, ocean world, heaven, underground)
 Middle age as the final world
 Dystopian game world, humans destroyed the earth.

3D perspective

Polluted map in the beginning of the game.
 It turns 3D if the level is finished and the world is cleaned

Characters

You can choose your character (determine their own appearance, select gender, put together different outfits, equipment). And you have to complete certain tasks or levels to get more choices and possibilities to choose your character.

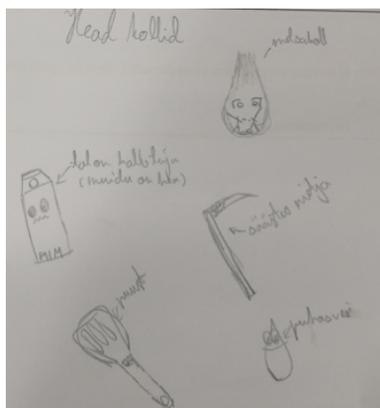
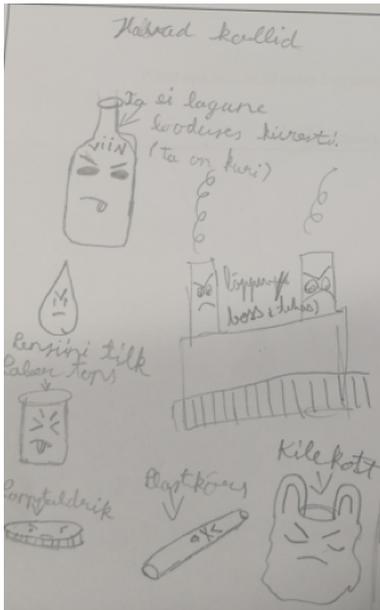
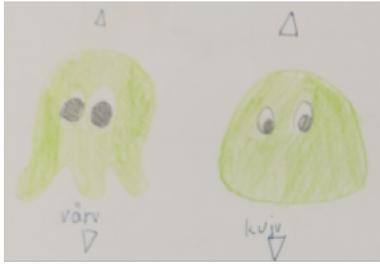
The figures adapt to the levels/worlds and get different equipment (look and equipment, e.g. firefighter suit in lava land, boat and sailor suit/scuba suit in ocean world, knight's armour in middle age etc.).

There is an end monster and you make it weaker by turning the bad monsters into good ones.



Main character could be some endangered species, who is a little sad, because it is worried about the planet. The main character helps the other characters understand that their actions have consequences and teaches them how to make better choices and clean-up the world.

Other characters: humans and animals who do not care about the world and do not worry about polluting the environment. There is also one really bad villain in the game who uses garbage to rule the world and turns landfills into monsters. And the main character has to defeat these monsters.



Main character is a blob. You can choose the shape and colour. You can choose different outfits (e.g., clothes, some of them are second-hand and they give you more points later in the game).

Main character is a blob that was forced to leave its home planet Earth because of the garbage monster. But life on the other planet is not easy; the planet is small and also dangerous. So the blob together with its friends decided to go back to Earth and save it. When they arrive ... everything is in ruins.

The blob uses a space ship to fly to Earth and walks around in the game world on foot.

Other characters in the game are things that pollute the Earth (bad characters), e.g. plastic bag, straws, bottle cap, wastewater, cigarette butts, single use dishes (not biodegradable and thrown somewhere into the environment), old cars, petrol spill, a factory ...). And they have taken over the planet, because they already ruined their previous home planet and left it in ruins.

Bad characters - creatures could were icons on clothing as shown in the graphic.



But the bad characters do not know or understand themselves that their actions are not environmentally friendly. So the main character helps them to understand how to be better.

The blob also has some friends (friendly characters) - clean water, bio-products (wooden spoon/fork, bamboo toothpaste, bicycle, and biodegradable stuff).

	<p>The main character found an old watch while sorting waste. And with this watch he/she can travel back and forth in time.</p> <p>Other characters and things/objects that pollute (plastic bags, broken balloons, Chinese lanterns, fireworks, oil spills). These objects have turned evil because humans have left them behind and thrown into nature and now they are angry and want revenge.</p>
	<p>The main character finds himself in a wizard cave and he is given an assignment to save the world from waste. Since the character already himself hates waste he agrees to take on the mission.</p> <p>There are bad characters “waste monsters” and good characters who help the main character.</p>

Levels

Players have to play through the levels. Players successfully finish the level if they transform the bad creature into a good creature.

The player starts in a polluted world and has to bring the world back into planetary boundaries. The world can be saved by completing different tasks in different worlds (see game world).

Each world is a level. The world can be organised as mini games and follow different logics (e.g. puzzle, point n click etc.). Alternatively, in each world/level, different mini games could be played. This way, each task (see table of tasks below) is a mini game.

The structure of the levels could be identical, the content would be different.

If players meet single monsters/creatures they could enter small extra levels/mini games in which they e.g. have to separate waste etc.

The final level could be a middle age world. The player can enter it with a time machine and has to make environmentally friendly changes and convince the people to live sustainably to rescue the world in the here and now (alternatively, the idea of travelling back/forth in time could not be limited to the final world but could be a leading narrative and play a role in every world - see ‘Story and Narrative’).

Difficulties vary: easy, medium, difficult.

In story mode the difficulty level increases.

In the multiplayer mode the players can adjust it themselves.

In story mode there are no game rules. In the multiplayer mode there are no game rules in the normal/medium difficulty level but in the hard version there are

Assignments/tasks in the game

Easy	Medium	Final assignments
You just have to read or look at some information in the game or gather some stuff, which might be useful in the next steps of the game to solve some task, or answer some quizzes.		Pop-up quiz ... you have had some time to wander around in the game and learn some stuff. If you have been paying attention then you know the answers to some questions.
True or false pop-up quizzes	Build something using bio-based building materials.	Build something using bio-based building materials.
Choose the right answer(s)	Save animals	You have to make changes in the Monsters house and make it environmentally friendly.
Memory game - connect the pairs.	The monster is throwing stuff at you and you have to catch and sort it (it can be easier and more difficult, it can be that you have to do it and the time runs out, or you get more stuff to sort).	The monster is throwing stuff at you and you have to catch and sort it (it can be easier and more difficult, it can be that you have to do it and the time runs out, or you get more stuff to sort).
You pick and sort waste and learn how to do it - and earn points.	You learn how waste can be used as a resource to produce energy.	You learn how valuable waste can be as a resource and you make new products out of it.

You learn about ecological footprint of travelling.	Alternative energy sources for transport from biobased solutions.	The future of transport and our energy sources.
You learn how to choose more sustainable products.	You learn about eco-labels, you learn how to make better choices and bring your own containers so you don't create more packaging waste.	

Control System:

Mobile phone: Swiping, tapping etc...

Audio, music, sound effects:

Nature sounds, friendly sounds, something positive

Technical**Target Hardware:**

Mobile (more kids have mobiles than personal computers or laptops)

Network requirements

Single player mode (story mode)

Multiplayer mode

World server/different servers

Players can build clans/alliances

You can invite your friends to play with you.

You can search for friends in the chat-box and write to them. You see other players on the game map and you can invite them to play.

You can invite your friends to defeat the end monster together or solve some tasks.

Game Art – Key assets, how they are being developed. Intended style.

The game world should not be in gloomy/ dark colors (not depressing) ... positive and friendly colours.

See pictures of the game world.

Jobs and Careers

Game Design 9: BiOrientation/Job orientation for future

Name	BiOrientation Phoenix/Name from Greek mythology Job orientation for future ... for future We rescue the world!
Genre	2D (Graphic) adventure/isometric perspective (see Stardewvalley)/map with target areas for different occupational fields incl. sub-routines with action, puzzle, slide, point' n' click, multiplayer, farming simulation, 2D side scroller, 2D platform mini-games
Target group	Youths [t2] and young adults looking for work.
Concept	The player enters a fictional world that challenges him/her and invites him/her to collaborate with others. During the development of the story, the player builds his/her professional profile (I discover, evaluate and deepen my skills and learn new ones). The profile thus created is connected to the real world through a kind of parallel LinkedIn bio (with subsequent community building).

Gameplay and Mechanics

Gameplay

At the beginning of the game, the player could choose between an individual version and a team version. Possibly, the player indicates previous experience at the beginning of the game (e.g. differentiation between pupils and graduates/trained/finished apprentice/professional experience). Difficulty level could be based on previous experience.

The player enters a world in the future where the gods have decided to destroy the world because it has reached a point of no return from an ecological point of view.

The player arrives on the world (as a demigod/goddess with superpowers) to announce the sad news, but rebels and decides to save the world. To do so, she/he loses her/his superpowers. The goal is to regain the superpowers and save the world.

[t4]

After the player has created his/her own avatar (see 2.4 Characters), the game starts in isometric perspective and shows the (damaged) world of the future with its different (occupational) areas (e.g. aligned with the 10 bioeconomy areas according to the EU Commission). The occupational areas can be entered individually and extend over several levels (level 1 comprises level 1 of all occupational areas, level 2 comprises level 2 of all occupational areas, etc.). The different occupational areas are similar in structure but differ in content (level 1 has task type X in all areas, level 2 has task type Y, etc.). In the course of the game, the players get to know different occupational areas of the bioeconomy, discover, test, evaluate and expand their occupation-relevant skills in small tasks, collect superpowers and develop their personal occupational profile in order to make their (occupational) contribution to saving the world.

Goals

Project goals: Generate attention, impart, link and transfer knowledge, gain career orientation.

Goals in the game: The player must regain his/her superpowers (through knowledge, commitment, empathy/cooperation, performance, etc.) and save the world.

- Collect points/game money/equipment/build tools (not only knowledge test, but also build/connect)/assemble puzzle pieces/build knowledge bridges (unlock connections).
- Unlock/upgrade superpowers, abilities, equipment/tools through points/coins
- Try out different (occupational) paths to reach the goal

Mechanics:

The gods hinder [15] or reward the players throughout the adventure, partly based on their whims, rivalries, likes and dislikes.

As the players progress through the game they

- 1) test and consolidate their 'real' skills and abilities
- 2) learn new "real" skills and abilities
- 3) gain superpowers that, together with their real skills, they allow them to progress in the game.

There are different classes of challenges and adventures:

- 1) Those that have arisen from the unsustainability of the world.
- 2) Those that have arisen from the whims of the gods.

Each challenge is built as a kind of subroutine that can have its own operating logic (shooter, point and click, slide, puzzle...). The player progresses in these challenges as an individual, but also in cooperation with others, sometimes even in competition.

Each occupational field/target area (e.g. forestry, food, etc.) has the same task structure, but contents differ.

Individual challenges:

The player can save a certain part of the world (occupational area) by taking on a certain occupational area (e.g. ecologically transforming the agricultural economy, supplying the world with renewable energy, transforming the textile and clothing industry/the chemical and pharmaceutical industry, etc.). At the beginning of the game, the player can already specify certain interests and qualifications, and the avatar will be equipped with competences accordingly. These skills are used to save the world. Knowledge and skills acquired in the various occupational areas/challenges can be applied in the course of the game. Recognise skills, deepen them, learn new ones, regain superpowers.

Collect points:

Tasks can be completed alone or in a team. The score of team tasks can be achieved in proportion to the player (e.g. 65 points out of 100 are necessary for completion (maximum score does not have to be achieved, as it is about professional orientation and (broad) testing) - one player can achieve 30 points, one 20 and one 15 - performance does not have to be the same, performances complement each other instead - diversity, interdisciplinary). If no other players are online, the game should still be playable, either with individual tasks or in an avatar team.

Points can also be scored by players helping others, sharing with them, etc. (common good orientation of sustainable occupations). (Common good orientation of sustainable professions). If another (weaker) player can make good use of points/equipment/superpowers, points are doubled/upgraded etc.

There should be incentives linked to real life to play the game (aftersales), e.g. career guidance offers, prizes, vouchers, etc.

Story, Setting and Characters

Story and narrative

The world is heading for destruction. The player who enters the game must help save the situation.

There are gods who have decided that the world must now be destroyed because people have been farming unsustainably in it. The gods send their messengers (demigods/goddesses with superpowers) to earth to

deliver the message and destroy the world. However, these players decide to rebel as soon as they are on earth because they believe that the world can be saved. They lose their superpowers and fight to regain them with their human abilities: This is the only way they can save the world.

Initial scenario can be played as an intro (film sequence). In the intro, different development scenarios could be anticipated (destruction, rescue through cooperation and economic/societal change) - a possible positive scenario must be visible for motivation, or it is important to quickly have a sense of achievement with regard to saving the world.

Alternatively, a more positive mood can be created in the story by sending gods/goddesses (demigods/goddesses) to save the world. The rescue team did not take into account that the demigods/goddesses lose their superpowers. Career orientation should be associated positively. However, history with impending destruction has strong drama.

The two basic motivational structures "cause and prevent" should be covered in the game in order to reach as many people as possible.

Game world

It's a dystopian world. It is the world in 30 years.

Characters

Borrowing of the gods from Greek mythology should be avoided (Represent patriarchy, lack of diversity and certain values to be avoided). The gods/goddesses could represent forces of nature (earth, water, air, fire). (Demi-)gods/goddesses must be and look diverse (in terms of nationality, gender, sexual orientation, religion, soc. origin etc.).

The avatar of the player(s) (demi-gods/goddesses) can be chosen at the beginning of the game. Avatar can represent personality, (job-relevant) interests, skills and abilities, values and goals (making a career, serving the community, preserving nature, personal development etc.) of the player. If necessary, avatars can start as almost "blank slates" (with only one skill, depending on initial career interest and qualifications), optionally choosing skills, interests, values at the beginning (career orientation).

Initially, avatars have no superpowers. Superpowers are acquired in the course of the game. There must not be one superpower that allows goal achievement.

A player can acquire several superpowers. Players acquire different superpowers that suit them. Superpowers should also be job-relevant and linked to real life/player. Players can find the superpowers they would like to work with (self-discovery/personal development).

Solving some tasks requires different skills, abilities and superpowers. These can be present in one person or in a team (interdisciplinary).

The design of the avatar can be based on the occupational field.

In the course of the game, characters meet other players/avatars.

Example of superpowers/abilities: Super eyes/glasses/magnifying glass (eye for context, details, attention), mouth (communication), heart (empathetic, team player, helpful), aura (charisma, leadership qualities), soft paw (diplomatic, tactful), question mark (critical eye), (technical understanding) etc. Superpowers can also be gadgets: Gloves (handy), belt, pocket knife (generalist, interdisciplinary) etc^[16].

There could be a time machine (gadget) ^[17] (can be found/built). The time machine can be used to travel back in time and turn the screws to enable sustainable developments (path dependencies, ecological tipping points (water consumption, industrial agriculture, and decisions for XY).

Levels

The game has levels, reaching (intermediate) goals is important for motivation.

A level is not an occupational area, but the occupational areas are "horizontally arranged", while there are several levels within the different areas (vertically). Thus, individual levels of different occupational areas can/must be entered and played in one level. To complete level X, it is not necessary to play through all levels of all occupational areas. It is sufficient if Y of X (e.g. 6 of 10) areas have been played through at level X to complete level X (vocational orientation). The order of the areas is not predetermined, but can be chosen according to interest. Also depends strongly on the duration of the game.

There are different types of tasks within the levels. For example, start with a multiple-choice task. The further the player progresses in the level, the more complex the tasks become, e.g. working out a complex solution in a team.

Since it is about career orientation, the player does not have to achieve 100% in one level to enter another career area.

To save the world, successes must be achieved in various occupational areas (forestry, agriculture, fuels and energies, textiles, etc.).

Pros and cons of the occupational field should be shown realistically and transparently.

At the end of the game, the player knows what he/she needs to make a personal contribution to saving the world. Based on the selected areas, different professions could be offered at the end of the game, for others the player gets contacts. There needs to be a sense of achievement at the end of the game.

Levels should be saveable.

Points to consider: Levels only make sense if the game can be played through/is linear.

Control system

The game should be as easy to control as possible (accessibility) in order to be accessible to non-gamers. Mainly with mouse, possibly also with WASD (arrow keys). On the smartphone with click/touch/enter and back buttons.

Simulation of a joystick, which is moved in different directions with touch, possible.

Audio, music, sound effects

Sound secondary. Resources should be focused on mechanics and visuals. Sound should fit the genre and theme (choose typical sounds), be pleasant, minimalist, not annoying. Many participants find the sound of the game annoying and turn it off. 3.

Technical

Target hardware

Desktop PC and mobile. As it is easy to programme a game for both mobile and browser. Only control differs. Since control should be minimal, little limitation.

Network requirements

At the beginning of the game, the player could choose between an individual version and a team version.

The game could be played with friends, classmates or with people from all over the world (browser-based).

Each player needs his or her own terminal, as it is browser-based. Multiplayer can be played via codes/server.

If the game is used in school classes for vocational orientation, [t8] a class size (20-30 players) should be able to play together.

The average team size for tasks that can/should be solved in teams should be 4-6 players, but can be variable depending on the task.

If the game is similar to Stardewvalley, players can visit other players (in their houses etc.) and work together with them.

The multiplayer version should not be mandatory for game play. Consider the possibility that other players may not always be online for team play (avoid potential for frustration). Team games could also be played with avatars. For example, a player can put together a team in the course of the game (who have certain skills/superpowers that are important for the team). If necessary, the avatars can then be replaced by "real" players when online.

Art of play - key assets, how are they developed? Intended style.

The game could start in a bird's eye view (isometric perspective), comparable to the view of a map, occupational areas and mini-games in occupational areas may look different from start/occupational area selection.

2D

There are both fantastic and realistic suggestions, possibly a mix of fantastic and realistic? Link to real world should be present, currently the only link is the information provided in game.

Realistic style is too detailed; minimalist comic style can reduce details (resource issue).

No dragon or monster setting (as we are also targeting younger people). Graphic style does not have to be realistic.

Link: https://store.steampowered.com/app/413150/Stardew_Valley/?l=german



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