Sparks

GAMIFICATION AND GAME-BASED LEARNING

BEST PRACTICES AND **REQUIREMENTS** FOR **DIGITAL ENVIRONMENTS**

Italy

Sparks

Strategic Partnership for Digital Education Readiness
Co-funded by the Erasmus+ Programme of the EU

Game-based Learning: best practices and requirements for digital environments

NATIONAL REPORT – ITALY

Lascò SRL

Project Information

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Introduction

The Sparks project

The COVID-19 pandemic had a significant impact on the delivery of Education and Training all over the world: almost 1.6 billion learners from pre-primary to tertiary education, including VET, were affected (UNESCO, "COVID-19 Impact on Education", 2020), while education and training providers have been forced to adapt to digital tools to maintain services to learners. The pandemic caused to students a significant loss due to the difficulty in re-engaging with education activities; their demotivation as they fall further behind; the curbing of their educational aspirations due to the uncertainty of the learning environment (OECD, "Education and COVID-19: Focusing on the long-term impact of school closures", 2020).

In this context, Sparks, a Partnership for Digital Education Readiness project, co-founded by the Erasmus Plus Programme of the European Union and implemented by six organisations from Greece, Italy, Spain, Poland, Portugal and Romania, aims to develop a new Conceptual Framework for Game-Based e-Learning Programs and E-Learning platform to let VET providers deliver innovative online learning experiences with the use of gamification, and boost their learners' motivation and engagement in learning.

The transnational research of Best Practices and requirements in digital environments

The transnational research developed gathers best practices and requirements for Digital Environments of game-based learning and gamification across the six European countries: Spain, Greece, Poland, Italy, Romania, and Portugal.

The research led by Femxa S.L.U has followed three phases. Firstly, the identification and collection of 48 best practices in game-based learning and gamification experiences, following a unified set of common criteria developed for the Sparks Project. Secondly, the development of an online survey as a quantitative research tool to validate the key game mechanics, dynamics, components, and game features found as success factors of the best practices collected. The survey was disseminated in the six countries to collect the input of 304 experts in education and training, validating with incredibly successful results the best practices. None of the key elements included in the survey received an average below an 83% of high ratings (4 or 5).

In addition, ten Focus Groups were implemented to gather the requirements and needs in digital environments of the VET providers and learners in the six countries involved. The Focus Groups were implemented with 144 educators and learners from different backgrounds of the VET community from the six EU countries that hosted 24 participants each. Lastly, the best practices and validated game features and the results of the discussions developed during the Focus Groups were comparatively

analysed by the expert researchers of the six organisations, concluding in this transitional final report.

The transnational research team will use the results to identify the process and system features and the game elements to transfer into a Conceptual Framework for Game-based e-Learning Programs.

Best Practices

Each partner organisation analysed the best practices in game-based learning and gamification for education and training in their country.

The definitions adopted by the research team for "game-based learning" and "gamification" are the following:

- "**Game-Based Learning** refers to the borrowing of certain gaming principles and applying them to real-life settings to engage users" (Trybus, 2015);

- "**Gamification** is the use of game elements and game design techniques in non-game contexts" (Werbach, 2012).

The following pages report the results of the analysis carried out by Lascò SRL in Italy.

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1. Allianz

Title	**Allianz The Game**
Date	2015
Authors	Allianz - Alittleb.it SRL
Geographical scope	Italy

Partners/Stakeholders

Allianz chose **AlittleB** (Zucchetti Group) as a technical partner for the SKILLATO® EXPERIENCE platform, based on traditional gamification dynamics and mechanics, scenario-based learning, user-generated content, user-centered design, interactive tools for knowledge management, and social interaction among gamers.

Target groups/Beneficiaries

The beneficiaries are more than 4,500 Allianz employees, broken down into 302 teams.

Context

Allianz wanted to launch an internal training program that was engaging, enhanced users' interest in the relevant topics, managed to make some concepts more interesting, as well as easy to remember, capable of improving task completion rates, and providing greater chances to use the concepts practiced during the gamed-based learning process.

Objectives

The key objective was to offer an interactive and immersive experience, so that principles of agile management and open leadership could be effectively taught. In doing so, it was necessary to roll out a versatile LMS platform, capable of hosting mini-games, mechanics and gamification elements, using Storytelling and Advanced Interactivity Training Objects, generating an increased participation rate and training efficacy, while primarily ensuring development and enhanced soft skills.

Process

Methodology, dynamics, and mechanics

The engagement strategy involves creating competition between groups in order to encourage the first "adopters" to invite other team members to delve deeper into the experience (user-guaranteed communication). In Allianz TheGame 2.0, the concept was refined to promote competition between teams capable of self-balancing, avoiding the problem of "best performers" (users with high performance who discourage other gamers from participating given that theirs chances of winning are virtually nil).

The training experience revolves around learning objects, specific types of self-consistent learning resources, with modularity, availability, reusability, and interoperability, which

allow them to be used in different contexts. These include:

- **Interactive videos**: selected excerpts from films, TV series, etc., in which the user was required to flag specific issues raised during the video (e.g. behavior aimed at overcoming prejudices, and going beyond appearances); after which dynamic feedback analyzed the responses and evaluated them.

- **Scenarios**: thanks to a story, an animated graphic novel, in which users personally take part in a group and, through their choices, opinions, decision-making, can apply in practical situations the abstract concepts they have learned or are in the process of learning. With each decision-making trade-off, users receive immediate feedback from the platform, which explains the consequences of their choices.

- **Path**: it allows users to graphically display their training path, including it in the story and interacting directly with the gamification logic. The path was depicted by a futuristic city whose main buildings, numbered from 1 to 10, represent the various steps and levels (called episodes) that each user must complete. Always clearly visible on the home page: the awards earned, individual and team points, and time remaining to complete the episode/step.

- **Rewards**: they consist of a number of different "certificate" models awarded to users who complete the training courses – which means going through all the planned activities, passing the tests, and staying in the game for the minimum time required – the competitions and prize catalogs, production bonuses, and so on. The "Curiosity" bonus is a special reward that goes to players who perform strongly based on the training content, i.e. those who show a constant desire to improve and keep up to date in the process of becoming leading team players.

- **Branding**: the improvements and, above all, the continuity of the user's commitment, were continuously displayed and stimulated through an avatar-profile. The related Skills Point System linked the single contents released on the platform to the skills, while providing a steady stream of goals for upskilling.

- **Open Badges:** digital certificates containing metadata on the skills and results obtained by the user.

Results

Rate of users who joined the project voluntarily: 95%. Thanks to the dynamics and mechanics of gamification, the project managed to reach about 11% of users who log in regularly at least once a day with an average training session of about 20 minutes. In total, during the 8 months while the program was running, the page views totaled roughly 2,000,000.

Given the excellent result and performance achieved, Allianz repeated the experience with the ALLIANZ EXPO project to encourage its employees to collaborate and find ways to involve users in mission-critical in-house issues.

Impact

The participants showed high levels of involvement and amusement throughout the process. By making use of the newly acquired knowledge in real and practical contexts, they improved the quality of the learned concepts and enhanced the learning value. This was true not only in terms of badges, points, and levels as the above-mentioned mechanics of gamification, alongside the scientific principles of recurrent recovery and spaced repetition, ensured high rates of completion of the path, as well as frequent and daily access to the platform. The coherent storytelling of the educational game, the usability of the game environment, and the careful design also provided an excellent user experience.

Success factors

A number of technical features of the platform was conducive to the success of the project. These include the following:

- **Microlearning**: the ability to obtain information and learn by consistently devoting a small amount of time on a daily basis.

- **Interaction and social learning mechanics**: they give gamers the chance to post comments, take part in surveys, and provide feedback to other posts.

- **Personalized content** through an internal algorithm, which in push mode, at each access suggests the best content, based on the users' characteristics, achieved goals, platform experience, internal and external performance, content distribution groups, and an editorial training program.

- **Highly interactive content** such as mini quizzes. There are special bonuses such as treasure chests and power ups (double life, time freeze, delete an incorrect answer) that can be spent during games.

- **Bets**: users can bet on themselves and their own skills, running the risk of losing double points, such as the Combo, that is, the correct answer to several questions in a row, which gives the user additional bonus points.

- **Training**: users can spend part of their points on training quizzes.

Limitations

No limitations proved particularly significant in the development and management phases of the project. The "novelty effect", and an initial mistrust about how to run the game and its training mechanics, were immediately offset by the user-friendly design of the platform.

Related resources: www.alittleb.it/portfolio-case-studies/allianz-the-game-2-0/

FINAL ASSESSMENT

Efficacy ★★★★★
The training process managed to combine usability and amusement by **lowering cognitive fluency**, which represented a potential barrier.

Transferability ★★★★★
The technical infrastructure and the gamification mechanics/dynamics can be easily used and transferred to other areas.

Usability ★★★★★
Excellent User Interface and User Experience Design

Playability ★★★★★
Balanced use of game mechanics, simple and engaging formats. Training and microlearning promoted a high platform retention rate and increased gamer commitment.

Innovation ★★★★★
It is a 2015 project that was highly innovative, both in terms of graphics, customer experience, and personalized content.

Inclusion ★★★★★
The inclusion of social learning mechanics promoted the involvement of all employees. The personalized content allowed training experiences tailored around different needs.

Efficiency ★★★★★
The game mechanics and dynamics used contributed highly effectively to achieving the desired results, both in terms of involvement, the quality of the experience, and the degree of customer satisfaction.

Ecosystem Diversity ★★★★★
The app can be used on any type of device or browser without limiting the user experience

Low   High

2. Campus

Title	Campus
Date	2008-2013
Authors	TIM S.P.A.
Geographical scope	Italy

Partners/Stakeholders

The "Campus" Social Learning Platform was an internal project of the company.

Target groups/Beneficiaries

The platform targeted the employees of the Customer Care service. From 2008 to 2013, 9.436 users were involved.

Context

Given the Company's structuring and, above all, the process characteristics (i.e., sharing telephone information with the user) it is not always possible to collect, optimize and share the enormous amount of information, knowledge, and good practices that so many employees experience in their daily activities. Furthermore, assessing the skills of operators, especially in terms of transversal skills, can prove to be an extremely complex task.

Objective

The main objective was to structure a social learning environment for Call Centers operators, namely a collaborative learning community that was tasked with collecting and managing internal company knowledge through the mutual exchange of know-how and data. The secondary objective was the mapping of skills and training the operators in technologies concerning new-generation mobiles (the so-called VAS Team).

Process

The platform was promoted as a social network. People were given the opportunity to enter a virtual campus where they could share tips, best practices, solutions, and problems, transferring them from the "closed" world of phone-based interactions with the customer, to an "open" environment. Specifically, all employees had their own personalized profile, the chance to add contacts and their related activities, include their expertise (skills and evaluation forms) training and teaching materials, manage their favorite contents, access the forum based on their specific level of expertise (which increased alongside the content provided).

A "My Campus" profile contains company information ("how the company sees me"), personal information ("how I see myself"), the streaming of activities and contacts that are

part of one's network, the notification history, and the outcome of the various mappings and learning tests (multiple choice quizzes). The analysis of skills and attitudes is then linked to the evaluation of the collaboration rate among colleagues and the planning of training activities (conventional and virtual learning, and on-the-job training).

A detailed "ranking and reputation" system was devised, under which a score was assigned to both the actions on the platform (publication of a content, activities on the forum or the blog) and the likes/votes that came in as feedback from colleagues. Through this system, the most voted and active users automatically appeared on the home page, together with the details of their participation rating and the quality of their content: these votes were based on the judgment of the community itself. Visibility and reputation were used as crucial factors in encouraging participation and helping talented employees stand out.

An internal Committee optimized and supervised users' activities to make their experience as pleasant and rewarding as possible. The interface and the customer experience were all about inviting and encouraging users to share techniques, skill sets, materials, and useful network guidelines.

As an incentive for onboarding, we relied on challenges with related goals and rankings. These actions were aimed at encouraging training, improving call management skills, and motivating participation. The targets of these challenges were not only individual users, but also teams headed by the Supervisor.

One of the core-drives we used was extrinsic motivations, involving the implementation of an objective-oriented path with a final reward.

Leaderboard: most active and top-rated users. Creation of a "Champion" ranking.

Reward: as for the rewards included in the gamification mechanics, we would like to mention the Medal for the most active and voted users (a monthly ranking), in addition to Campus Points and Coffee Points for those who uploaded or rated content, and those who interacted the most in conversations with other users. Further rewards, based on surveys involving all subscribers, were also handed out to the best teams.

The features and training programs include quizzes and specific forms for new hires.

The platform also contained a Report form with an analytical evaluation on training and behavioral deficiencies of each subscriber.

A weekly newsletter brought all subscribers up to speed on key trends and new contents.

And to round it off, there were Training areas dedicated to new hires and customer care users, area sales & incentives, as well as features such as "Ask for Help" available to users or your own contacts, and "Interview with Users": all of these were interactive systems for sharing good practices and troubleshooting solutions.

The technology used to develop "Campus" made possible seamless integration with other systems that back then were already being used within the company (Telecom intranet, Asp, .Net, Sharepoint, etc.). It was considered appropriate to roll out this new platform through an ad hoc system developed internally with dot.NET technology, that is, Microsoft SQL Server. Subsequently, Moodle and the open-source Learning Management System were integrated (almost imperceptibly for the end-user). The choice to keep the pre-existing systems up and running allowed the project managers to integrate data, thereby bypassing the risk of internal information silos.

Results

The numbers of the project were very encouraging: over 300,000 quizzes completed, with 12,000 "skill set forms", 1,176 blog posts with over 75,000 messages, and over 10,000 forum discussions, about 4,900 final "aptitude forms"; approximately 4,000,000 points awarded (content posted in the forum and blog, moderation of comments, tips, suggestions, communications between users, addressing questions among colleagues)

Important results were also obtained in terms of project involvement: total platform access numbered 1,229,003, with 39,854,600 page views, 1425 materials uploaded, and 40,308 downloads.

Impact

The participation of over 9,000 employees was highly significant. There were also users who only joined "Campus" for training or mandatory activities, but many others experienced it as a chance for growth and mutual support which, thanks to the gamification facilities, generated healthy collaboration and socialization. To the great satisfaction of managers and project supervisors, there were also cases of people who, by expressing their potential, aptitudes, and professional skills on "Campus", received unexpected recognition and new positions, even outside the Call Center.

Success factors

Managing the design phase and platform developments with an agile methodology (including the first launch of the beta version) was a key success factor in gathering feedback from early adopters, testing features, and upgrading the overall user experience. Furthermore, it was considered appropriate to create mini tutorials to explain the platform features and make the interface immediately familiar, especially for users with less experience on digital platforms.
By promoting the platform activities through gamification, it was possible to provide local managers with an objective skill evaluation for the operators involved, as well as a way to objectively gauge their propensity to collaborate, ability to deal with networking and handle problem solving.
The focus on generating empathy among users was a pivotal success factor: it was only by maintaining a sincere daily relationship between equals, within one's community, that it was possible to gain users' trust, esteem and above all to become aware of the actual needs of each employee.

Limitations

No limitations proved to be particularly significant in the development and management phases of the project. Also taking into account that the degree of digital skills was not yet widespread in 2008, many users still managed to maintain an acceptable level of interaction with the rest of the community.

Related resources

- https://www.youtube.com/watch?v=jiD0EEeVIUM
- https://www.slideshare.net/Marco_Lotito/social-learning-per-tim-119-consumer

FINAL ASSESSMENT

Efficacy ★★★★☆
The practice proved to be highly valid since it managed to combine usability with the effectiveness of project actions and objectives.

Transferability ★★☆☆☆
The platform is protected by copyright, with self-produced content. On the other hand, the dynamics and mechanics used could be transferred into different learning contexts.

Usability ★★★☆☆
Developed in 2008, this was a pioneering project. Given the standards of the time, usability was satisfactory.

Playability ★★★☆☆
Excellent social learning dynamics, whereas the variety and quality of the game dynamics can be improved.

Innovation ★★★★☆
The project was highly innovative at the time. Key strengths: its ability to integrate external platforms and data, and engage users with typical social network dynamics..

Inclusion ★★★★★
The inclusion of social learning mechanics promoted the involvement of all employees. The personalized content allowed training experiences tailored around different needs.

Efficiency ★★★★☆
The game mechanics and dynamics contributed effectively to achieving the desired result, both in terms of involvement, the quality of the experience, and the degree of user satisfaction.

Ecosystem Diversity ★☆☆☆☆
The application is limited to internal use and given its outdated programming language it may not be compatible with most modern devices.

Low   High

3. Talent Factory

Title	**Talent Factory**
Date	2020-2021
Authors	Talent Factory
Geographical scope	Italy

Partners/Stakeholders

The technical supplier, Whappy, is a company specializing in enterprise gamification solutions, operating in over five countries all around the world. The company designed and developed a customized white label version of "Talent Factory", in collaboration with the Manu Agere brand.

Target groups/Beneficiaries

A total of 80 target companies were 80 selected, that are members of the "Talent Factory" Group. For each of them the platform was implemented, and data collected from deliverables, for an average timespan of 6 months. .

Context

Due to the recent Covid-19 pandemic, now more than ever special attention has been paid to the management of human resources that have been deprived of the physical work environment and context. Smart working, remote work management, and the collapse of conventional company silos compelled to rethink talent management processes across the board, tapping the opportunities provided by digitalization in a careful and targeted manner. It is no coincidence that in 2020 the lack of proper talent to support company growth was cited as the primary risk factor by over 20% of the managers interviewed (*KPMG 2020 CEO Outlook COVID-19 Special Edition, KPMG, 2020*).

Objective

The key objective of the project was to provide customers with a training platform to achieve full employee involvement, enhancing personalized learning and through a structured learning journey/career path aimed at tangibly increasing productivity. Therefore, the goal of the "Talent Factory" was to directly launch the program, the approach to which was already standardized, but also totally customizable and scalable based on the needs of all the target companies involved.

Process

The platform's core functionality can be summed up as follows:

- **Management of networks and employees**: integrated real-time management of all employees, vendors, or collaborative networks at different levels, operating in

department areas according to the company's in-house logic.

- **Strategic HR management**: ideal team management tools for coordinating activities and planning sprints.

- **Training**: learning and career-oriented paths with "the learning by doing" and "continuous learning" processes.

- **Distribution of HR services**: self-service for managers and employees embedded in a mobile device, that is, a user-friendly, ready-to-use, and convenient system.

- **Employee engagement**: incentives for employees, promoting better professional positions as well as enhanced management of their learning journey and career path.

- **Rewarding**: it is a series of systems designed to assign benefits, rewards and fringe benefits, a series of compensation that very often involve use of a company car, and which are regulated by specific taxation guidelines.

- **Talent acquisition**: structuring candidate-centered experiences by matching the best candidates, employing innovative technologies such as AI and machine learning.

- **Performance management**: aligning individual and company objectives, with performance management focused on each employee and work team.

- **Career development**: ability to create development plans to bring employees in line with their career goals.

- **Talent management**: analysis of macro-organizational trends related to talents and for proactively planning future needs in terms of leadership and other roles.

- **Performance rewarding**: performance evaluation, achievement of objectives and other parameters to calculate salary levels.

Results

- Digital conversion of the employed HCM processes: 87%
- ROI (Return on Investment) achieved by the customer: 20%
- Process standardization and scalability, with decrease of processing time: 30%
- Decrease of the internal cost for training and consultancy: 24%
- Increase in margins per single customer: 15%
- Increase of average consultancy activities on high-value clients: 20%
- Increase of customer loyalty throughout the average full life cycle: 30%

Impact

The impact for the organization was relevant. Time saved on training activities decreased

by 24%. The implementation of enterprise gamification allowed the Company to more easily deal with changes, guiding the companies involved in the adoption of desired behaviors, facilitating multi-tasking, and motivating each employee to set increasingly ambitious goals for their own professional and personal growth. As the number of participants in the game increased, enterprise gamification could help create strong team values and enhance team building. If employees are aware that working together can help them win, they tend to collaborate more intensively and share information spontaneously.

Through an assessment process based on a model panel of customers, in 80% of cases it was possible to identify common features of the services provided to typical customers. This made it possible to identify a functional framework capable of implementing a new process for providing HR and HCM services; it was a digital process aimed at eliminating recursive processes, significantly shortening them, while ensuring that the physiological inefficiency typical of services provided was avoided in the conventional offline mode.

An AGILE approach: a phase of co-design thinking was carried out in collaboration with the Company's partners and managers, in order to promptly implement the processes as imagined and redesigned by the team. Once the dataflow and the scheduled deliverables were precisely defined, the various (and existing) components of the platform were assembled to obtain the desired customization. And once the pilot platform was greenlighted – following evaluation by a limited number of internal users and employees of the main partner companies – it was possible to validate the POC and thus move on to the actual launch phase of the platform which saw the first customers use the app on an increasingly massive scale.

Some technical features of the platform favored its success. These include the use of gamification to attract and retain the most talented resources, and enhancement of the recruiting process by quickly finding and hiring the right candidates, due to a targeted and qualified assessment of their talents. Gamification improved the loyalty rate and provided quality learning, as well as professional growth, that were clear and recognizable to all users.

Related resources/Link: https://www.fattoriadeitalenti.it/

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FINAL ASSESSMENT

Efficacy ★★★★☆

The project proved to be highly effective since it managed to combine usability and amusement by lowering cognitive fluency, which represented a possible barrier.

Transferability ★★★★★

The technical infrastructure and the game mechanics and dynamics can be easily used and transferred to other application areas.

Usability ★★★★★

Excellent UI and UX design, highly intuitive use.

Playability ★★★★★

The conceptual schemes of the game, its mechanics and dynamics are extremely simple which makes it easy to access even for less experienced players

Innovation ★★★★★

Manifested in the approach used during the testing phase, and in the rapid development (at the rate of the pandemic) of a solution that had an excellent impact on the company and proved to be a valuable tool.

Inclusion ★★★★★

The simple and user-friendly interface ensures that all users, regardless of their skill or any possible psychophysical disabilities, have equal access opportunities.

Efficiency ★★★★☆

The game mechanics and dynamics contributed in a highly effective manner to achieving the desired result, both in terms of involvement, the quality of the experience, and of the degree of user satisfaction.

Ecosystem Diversity ★★★★★

The Saas application (with low marginal costs) can be used on any type of device or browser without limiting the user experience.

Low   High

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4. Ferrara Play&Go

Title	**Ferrara Play&Go**
Date	September 26, 2020 – May 21, 2021
Authors	"Metropoli di Paesaggio" Association
Geographical scope	Ferrara

Partners/Stakeholders

Ferrara Play&Go was part of the EIT Climate-KIC European project "Landscape Metropolis: time for action!", was jointly carried out by the Agency for Energy and Sustainable Development, Dedagroup Public Services, Bruno Kessler Foundation, and Politecnico of Milan, with the collaboration of "Metropoli di Paesaggio" Association, AMI Ferrara, SIPRO, Città della Cultura/Cultura della Città, ICOOR and the University of Ferrara. Partners and sponsors included several institutions, companies, and associations, including AMI, "Annunziata" Hotel, "Schiaccia" Restaurant, "Cloister" Art Gallery, "Apollo" Multiplex Cinema, "Arcobaleno" Pizza Restaurant, "Visit Ferrara", and SPAL Football Team, which offered numerous rewards, awarded on a weekly basis and at the end of the game.

Target groups/Beneficiaries

Citizens of Ferrara. Over 663 users involved, mostly women (54%) aged between 20 and 55 years.

Context

This project aims to decrease the use of cars, moving on foot, by bike or perhaps even by boat, to collect as many "sustainable kilometers" as possible in order to help the environment, but also to collect points and pick up rewards. The cornerstone of the project is enhancing the landscape, seen as an infrastructure, favoring the connection between urban, peri-urban, and suburban areas through the implementation of a sustainable, innovative, and combined mobility network.

Objective

Ferrara Play&Go is a sustainable mobility project whose objective is to render the use of sustainable means of transport both pleasant and rewarding, and to measure the effects achieved, as well as the impact on the mobility system.

Process

Once the registration phase is complete, the user can create his/her own profile by adding an avatar and a name. A "wizard" illustrates all the features of the app, that is, the number of points scored, the actions, and the functions, to simplify the onboarding process. Users start with zero points and a leaderboard immediately shows the number of Green Leaves (100) they must collect to exceed a specific threshold.

Users track their sustainable trips (by bike, on foot, by bus, train, car-pooling, or boat). The validated trips, that are verified through mode-detection algorithms, allow participants to earn Green Leaves points and move up the rankings.

To achieve a deeper and more stimulating level of involvement, personalized mobility challenges and dynamic game content keep participants motivated. New game elements are in fact unlocked by participants based on their level. The system also provides for the automatic generation of weekly challenges, both for individuals and couples, which are calibrated in terms of the participants' actual skills and aims to encourage a change in behavior towards ever-increasing sustainable mobility habits. For example, challenges included taking a trip by the end of the week to earn 50 bonus points, and couple challenges only stop when levels 4, 5, and 6 were reached. For this type of challenges, users can compete with other players to gain as many green kilometers as possible, complete the task in less time, or combine their results to challenge other couples.

Many local businesses and shops participated in the project and raffled off several prizes, which are awarded on a weekly basis to citizens who used the app and were more sensitive to sustainable mobility. The most popular weekly prizes included SPAL jerseys, pizza vouchers, and public transport tickets, while the final rewards were smart watches, bicycles, hotel accommodation, and annual public transport pass.

Here is a breakdown of the rewards for the top-10 players, e.g. those who scored the most Green Leaves Points by the end of the Ferrara Play&Go project:

- *First place*: one unisex CityBike;
- *Second place*: one annual card for urban public transport;
- *Third place*: one FitBit Sportwatch;
- *Fourth place*: a one-night stay in a standard double room for two people at the "Annunziata" Hotel,
- *Fifth place*: one green backpack – solar recharge;
- *Sixth place*: one all-inclusive dinner for 2 people at "Schiaccia" Restaurant;
- *Seventh place*: one bike bag;
- *Eighth place*: one SPAL third jersey;
- *Ninth place*: one annual SUPPORTING card at Art Gallery Cloister;
- *Tenth place*: one monthly urban public transport pass.

As regards the weekly rewards, each week there was a reward for the player at the top of the weekly ranking, and 2-3 prizes for those who ranked in the "Top 50".
Some examples of weekly rewards:
- Urban monthly personal Local Public Transport Pass
- SPAL third jersey
- Annual SUPPORTING card at Cloister Art Gallery
- Refurbished bike
- Guided tour in Ferrara
- 2 discounted Cinema tickets
- "Metropoli di Paesaggio" bag and water bottle
- 2 free pizza slices

Results

Data updated as of 03/18/2021:

- Number of registered users: 663
- Total number of sustainable trips: 14,764
- Total number of sustainable km covered: 56,050
- Total number of zero-impact km tracked: 42,330
- Number of weekly challenges won: 1,526
- Number of weekly rewards awarded: 66
- Number of weekly rewards still up for grabs: 30

Number of trips per mode
- bike trips: 6,584
- bus trips: 1,256
- train rides: 265
- journeys on foot: 6,604
- carpool trips: 55
- boat trips: 16

Number of km per mode
- km by bike: 29,745
- km by bus: 5,784
- km by train: 7,150
- km on foot: 12,585
- km in carpooling: 770

Participants' demographics
- Gender: 54% female, 46% male
- Age: 13% 14-20 years, 42% 20-35 years, 31% 35-50 years, 14% 50-70 years, 0%> 70 years
- Domicile: 81% Province of Ferrara, 19% other Provinces.

Impact

As of 03/18/2021, 663 users had registered. They took 14,764 sustainable trips, for a total of 56,050 sustainable km.

Five months after the launch of the project, and after 20 weeks of gameplay – despite the Christmas break in mobility due to the pandemic-related lockdown – participation not only did not decrease but increased significantly. Since January, there were an average 700/750 trips per week in the period running from September to December 2020, up to 950/1,000 sustainable trips tracked every week in January-February 2021, with an increase of approximately 40%. The trial showed both the ability to support citizen participation in long-lasting games, and to inspire users' behaviors: players stated that they had adopted more sustainable mobility habits and had tried out at least one new means of sustainable transport thanks to this game.

And last but not least, an important result was that a local community of active users emerged and was willing to raise awareness among citizens about more sustainable mobility.

Success factors

The gamification experience was fundamental to activate and incentivize, through the game, virtuous habits on the part of citizens, as well as educate them about new environmentally and socially responsible practices. The ability to connect and relate, as taught by the game dynamics, also enhanced the socio-relational aspect between users, who could engage in healthy competition, join community challenges, and win prizes offered by local shops and companies, thus contributing to strengthen bonds within the territory and the community.

Related resources

- http://metropolidipaesaggio.it/progetti-pilota/playgo-ferrara/
- https://www.cronacacomune.it/notizie/41430/ferrara-playgo-quasi-15mila-viaggi-registrati-dalla-app-che-premia-spostamenti-piedi-bici-o-mezzi-pubblici.html
- https://www.smartcommunitylab.it/apps/ferrara-playgo/

Sparks

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FINAL ASSESSMENT

Efficacy ★★★★★
The project proved to be highly effective since it managed to combine usability and amusement by lowering cognitive fluency, which represented a potential barrier.

Transferability ★★★★★
The Play&Go platform will also be used in the context of the Ferrara Bike2Work campaign, to promote home-work bike trips. The experience can be transferred to other cities and other contexts.

Usability ★★★★★
The not overly complex game mechanics, together with the use of simple and interactive formats such as the classic Point/Badge/Challenge and Leaderboard system, offered excellent gameplay.

Playability ★★★★★
The game is extremely simple, fun to play and intuitive. It does not require any technical knowledge or special rules to be learned. Just start walking or cycling.

Innovation ★★★★★
Its ability to create relationships and connections with all stakeholders and community members is innovative. It's more conventional in terms of game design.

Inclusion ★★★★★
The app is so user-friendly, and its game mechanics so simple, that anyone can play and access all the platform features.

Efficiency ★★★★★
The game mechanics and dynamics contributed in a highly effective manner to achieve the desired result, both in terms of involvement, the quality of the experience, and the degree of user satisfaction.

Ecosystem Diversity ★★★★★
The app can be used on any type of device or browser without compromising or limiting the user experience.

Low   High

5. Watchout!

Title	WATCHOUT!
Date	2020
Authors	D. Basile, V. Goretti, A. Fusinetti, A. Martinelli, M. Raffaele (Gamification Lab, Rome, Italy)
Geographical scope	Italy

Partners/Stakeholders

The project was carried out by Gamification Lab, a university laboratory of the Computer Science Department of La Sapienza University, located in the Interdepartmental Research Center DigiLab which is dedicated to researching and teaching in the field of human-machine interaction, 'gamification', games/video games and simulation. The project was developed in collaboration with two consultants of the Bank of Italy, Roberto D'Angeli and Angelo Della Ragione, and thanks to the technical support of the company coach and trainer, Giovanni Bruni.

Target groups/Beneficiaries

The game targets the inspectors of the Bank of Italy. Specifically, the first game test was tested on a specific and restricted group of users, taken as a representative sample of the target segment.

Context

There is currently no similar gamification software available on the market. In recent years, the only 'inspection-based' game that gained a modicum of success has been "Papers, Please!", which inspired several minor new indie titles over the past year.

Objective

The primary goal is training. The aim is to overcome the need to instruct groups of Bank of Italy inspectors about counter checks and at the same time gauge their ability to carry out the correct control procedure. The players, while identifying themselves with the character, must test their skills in a safe setting and then become accustomed to the work environment. The simulation was designed to be employed both in training and as a self-assessment test.

Process

The product is a classic graphic adventure game, as players make visual/textual choices which will affect their progress, like in "Her Story", "Monkey Island", "Beneath a Steel Sky", and "Heavy Rain". It includes:
- **Resource management** – In order to advance in the game, players need to optimize scores representing specific resources that should never be exhausted.

![Sparks logo]

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- **Fixed setting with variables** - The level backgrounds are static, and the only variable graphic elements will be the ones that can be used by the players.
- **Graphic style** – Given the specific features of the game, and taking into account potentially inexperienced users, the game offers a very iconic and simplified graphic style, derived from Nintendo's unique communicative style and Flash Games.

The game, in the form of a simulation, deals with the topic of counterfeiting from the point of view of a Bank attempting to combat it. The players take on the role of a Bank of Italy inspector and the efficiency of their work, which will be scored and translate into various benefits (or otherwise disadvantages), displayed in the surrounding environment. The game effectively simulates an inspection carried out by the Bank of Italy, which presents a very precise procedure that must be performed in the best way possible to obtain the maximum score: with the need for checks to be carried out, while following a well-defined procedure and workflow.

The player starts on a map that shows the branches/levels that need to be checked; at the beginning, only one branch is active and only by completing a level can the players advance in the game and check the branches. Each branch is affected by a variable number of irregularities, while the difficulty level grows steadily, and it will be up to the inspector's skill and capacity to find and report them all, while making sure to act appropriately when reporting. The simulation includes a Checklist of inspections that need to be performed. You can perform an inspection through three available 'Actions': 'Compare the Master Data', 'Check the Machinery', 'Ask the Operator'.

Each 'Action' makes it possible to select specific Checklist items, thus the players/inspectors decide which inspection to perform through multiple choices. The game scenario changes depending on the 'Action' and Checklist item selected, the inspector will be assigned to analyze this new scenario to check for any irregularities. An irregularity can be detected through a visual analysis of the game scenario, which can be made at each level. The analysis can be carried out through different methods: for example, by comparing the data already owned by the inspector or by interacting with the scenario. Any irregularity must be reported by correctly selecting the items displayed in the Tablet Interface, making sure that they match the correct procedure to follow.

The score will be affected by correctly selecting the items that match the procedure to follow in case of any irregularity. Since the players/inspectors play the role of the Bank of Italy, good playing will increase the Bank's reputation and therefore people's confidence in the BCN. At the same time, the players/inspectors must also be careful not to waste money by requesting unnecessary resolutions of irregularities. At the end of the game, that is, when all the inspections in the Checklist have been made, the players will receive a summary of their answers that will highlight the correct and incorrect answers, in order to assess the outcome of the inspection.

The objective of the game is to carry out perfect checks, thus maximizing the players' social and work-related contribution. A 'perfect game' will make the players/inspectors gain a reputation in favor of the Bank of Italy.

The game is developed as a simulation of a modern bank branch, with standardized features. The branch can be accessed through a map selection. The levels represent individual bank offices, where surprise inspections regarding money processing machines, branch structure and other available records, are usually conducted.

The game environment is broken down into **four areas**:

1. Possible Actions
2. The Tablet Interface
3. The Game Scenario
4. The Score

1. Actions define the first possible input from the player; it will be possible to decide which inspection to perform by clicking on one of the buttons, through the Tablet Interface. **2. The Tablet Interface** is directly connected to the game environment; the Tablet allows the players to decide which inspections to perform, whether or not to report any irregularities, thus completing the teller check procedure. **3. The game scenario** is the environment in which the players carry out the visual analysis of the branch, in order to check for any irregularities and report them. **4. The Score** is divided between 'Reputation', 'Money' and 'Branch Rating'.

The game evolves according to different mechanics, since the inspector's work requires different types of inspection, which have been outlined below and embedded in the game as types of action:

- multiple choice selection, which allows the players to manage the inspection independently, thus testing their skills in a safe setting and helping them get used to the work environment;
- analysis of the game scenario, which simulates typical situations that may occur during an inspection;
- the quiz: it is part of the reporting phase, useful for checking the effective skills of players while dealing with an irregularity.

The score of each level is calculated based on three features:

1. The Money spent during the inspection;
2. The Reputation of the Bank of Italy among its branches;
3. The Final Evaluation drafted by the inspector, regarding the branch.

Any player's choice, whether it be the identification of an irregularity or the decision to address it (or to not take any action because everything is in order), will affect the two main scores: Money and Reputation, which will be lowered in case of a failure and increased (although not always) otherwise, following a ratio that is balanced in line with the severity of the irregularity. This is because, once the irregularity is identified, its resolution will cost money to the inspected branch, although at the same time, it will positively affect its reputation.

At the end of the inspection, the inspectors are required to give a Branch Evaluation, scoring from 1 to 4: a 'correct' evaluation will add additional points to those already gained

during the inspection. The score is tallied by finding the difference between the system-generated evaluation, based on the number of existing irregularities, and the evaluation given by the players, based on the inspectors' awareness of the severity of the irregularities. The latter score will be weighted against the previous points added, giving the players their final score that will be displayed on the map and possibly be uploaded into online rankings.

Button: Shows how many irregularities can be found in the bank

Points gain: weighted decrease as a function of the divergence from the correct answer.

Scoring System: The figure shows how the scoring system assigns points for each answer given by the players/inspectors. The scores are displayed by two digits (0.0): the first represents money, the second represents reputational value.

The Unity Engine was used to make this 2D game; The game structure was developed in C#; The graphics were created in Adobe Illustrator; The group project was organized using Google Drive for sharing the graphic assets and Github for sharing the code and the Unity project.

Results

The first simulations provided a valid training and self-assessment tool for the inspectors of the Bank of Italy. Through the game they could learn, consolidate and check their skills. Representatives and managers of the Bank of Italy were enthusiastic about the results. The project was an important first step in introducing the Bank to the gamification environment and open a pathway that would increasingly integrate this technology with the different experiences in the field of internal training and awareness of the public at large as well as information on banking services and activities.

Impact

The first trials, thanks to the collaboration with managers and inspectors of the Bank of Italy, yielded valuable insights that would enhance the gaming experience but above all they made it possible to involve various banking groups, including Unicredit and Monte dei Paschi, providing them with a customized version of the platform.

Success factors

The gamification features of this product are easily identifiable thanks to the accurate transposition of an actual working environment and its dynamics, through game-based and parameterized mechanics, The project proved to be a useful self-assessment and training tool for inspectors during their training process, thanks to the above-mentioned gamification techniques, making the inspection procedure more interactive.

Limitations

The platform is still in the Beta Testing phase. The Bank of Italy and the managers of GamificationLab Sapienza are studying how to convert application prototypes into marketable products. Further developments and tests with new partners will add to the

gaming experience and all its components, making it an even more effective and efficient tool.

Related resources:
https://economiapertutti.bancaditalia.it/notizie/2020/gamification/GOODELEVEN_2.pdf

FINAL ASSESSMENT

Criterion	Rating	Description
Efficacy	★★★★☆	As a first trial test, the use of this software was proven highly effective in terms of its potential for gamification to be scaled up within the training environment of the banking industry.
Transferability	★★★★★	Other banking groups are already running this software in their training programs. The dynamics and mechanics used could be transferred to other education and training fields.
Usability	★★★★★	The simple game mechanics, in addition to the use of well-known conventional, user-friendly and interactive formats, have contributed towards achieving excellent overall usability.
Playability	★★★★★	The game is extremely simple, fun to play and intuitive. Users are not required to learn any special rule or technical knowledge.
Innovation	★★★★★	The game is innovative in its ability to create an impact and appeal to a working environment that still makes scarce and infrequent use of gamification in its training projects.
Inclusion	★★★★★	The simplicity and usability of the app and the highly simple game mechanics allow anyone to play and access the platform's features.
Efficiency	★★★★☆	The game dynamics and mechanics largely contributed to achieving the desired objectives, be it at the level of involvement, the quality of the experience, or the degree of user satisfaction.
Ecosystem Diversity	★★★★★	The app can run on any type of device or browser without compromising or limiting the user experience.

Low   High

6. Summit 2030

Title	Summit 2030
Date	2016
Authors	Modena Municipality
Geographical scope	Italy

Partners/Stakeholders

The game was devised by the Municipality of Modena and developed in collaboration with the computer game designers and developers Andrea Ligabue, Giorgio Gandolfi, and Matteo Bisanti from the Play Res Game Science Research Center. It was part of the European project called "Shaping Fair Cities" and was intended to focus global attention on the themes included in the 2030 Agenda for Sustainable Development. .

Target groups/Beneficiaries

Summit 2030 is suitable for all age groups, i.e. for younger players there is a "host", namely a character who encourages and leads a cross-cutting discussion on the 2030 Agenda. The game is designed for up to 6 players, but there can also be as many as 6 teams. .

Context

The game was developed within the framework of "Shaping Fair Cities", a project funded by the European Commission's DEAR (Development Education and Awareness Raising Programme), which supported activities that involve EU citizens in social, economic, and environmental issues of worldwide relevance. The project, that was led by Emilia-Romagna Region and carried out from 2018 to 2021 in partnership with 17 organizations from 9 countries, both EU members (Italy, Croatia, Denmark, Greece, Poland, Romania, Spain, and Sweden), and non-EU members (Albania and Mozambique), was designed to raise awareness and actively involve local administrators and decision makers, public officials, civil society organizations, and citizens on the "localization" of the 17 objectives of the 2030 Agenda for Sustainable Development. In the survey conducted by the Municipality of Modena as part of the project, aimed at investigating citizens' awareness of the 2030 Agenda, it turned out that only 15% of the interviewees had heard of the 2030 Agenda, with a lower rate among women in the middle age group (30-44 years). The awareness rate proved to go hand in hand with the schooling rate, in fact it was higher among the youngest, the graduates, and self-employed workers.

Objective

The game calls upon people to reflect on the contribution that everyone can make to achieve – in a balanced, interconnected way, and in the interest of the community – fully sustainable economic, social and environmental development.

Process

Game components: 1 board; 18 voting cards: 6 "Yes" cards in 6 colors, 12 "No" cards in neutral color; 2 sets of tiles representing the 17 Sustainable Development Goals (34 total tiles): a set of square tiles (C1), and a set of round tiles (C2); 22 role cards, with the associated Sustainable Development Goals (SDGs); 1 "migrations" dice, 1 deck with 90 action cards, which are broken down into thematic cards featuring an orange symbol (cross, triangle, circle and square); "migration" cards, depicting a dice on a rainbow background; 1 rulebook.

The aim of the game is to bring the SDGs indicated in your role card to the highest level in the debate, that is, on top of the "priority scale" depicted on the right side of the board, and then to discuss the issue with all players.

The final score is based on the level of SDGs (included in each player's role card) reached by the end of the round, on the priority scale. Each round ends when the highest level on the priority scale is reached, so an SDG becomes the subject of global debate, and all players approve it. The match ends in the third round, at which time the points are tallied. You can decide to play a shorter game, playing only one or two rounds.

The players, possibly with the help of the above-mentioned "host", break the 17 SDGs down into a set of round tiles and arrange them within the 4 thematic areas shown on the left side of the board; each area is identified by a symbol: a cross, circle, square and triangle. Each thematic area must contain at least three but no more than five SDGs. The criterion for the SDG breakdown is freely established by the players; each area can be associated, for example, with a topic ("Energy", "People", "Economic activity", and "Rights"), or with a category ("my neighborhood", "my city", "my region", "my country"), or a feeling ("Worrisome", "Important", "Challenging", "Indispensable"). Each round consists of three phases: Arranging the SDGs on the priority scale. Raising the SDGs to global attention. Calculating the score. When an SDG reaches the "Let's Talk About It!" tile, a global debate gets under way. The player who raised the issue must briefly explain why the chosen SDG should be considered a priority and why it deserves the positive votes of other players. All players vote secretly and place a vote card ("YES" or "NO") face down in front of them. The game ends after completing the third round, or at the end of the first round if you choose to play a shorter version. The player with the highest score is the winner. In case of a tie, the players share the victory.

Results

17 Associations were involved: Free Africa onlus, Alfeo Corassori, Amazonia and Development, ARCI Association – Modena, Kabara Lagdaf Association - Modena, Children in the Desert, Chico Mendes Cooperative - Modena, "Oltremare" Social Cooperative, Dominicans in Modena, "Ho Avuto Sete" Onlus, Iroko, Mani Tese, Modena meets Jenin, Overseas, Tefa Colombia Onlus, Uisp Modena solidarity Onlus. An overview of their activities was published and shared with all those involved, and posted on the web and social media of the Municipality of Modena.

Impact

By June 2021, thanks to Summit 2030, the Municipality of Modena increased the awareness on the 2030 Agenda and the Sustainable Development Goals of about 150 students. The Municipality integrated the game into the learning paths centered on education for global citizenship entitled "Modena Calls the World", providing primary and secondary schools in the Modena area with the game. These learning paths were selected by the Committee of the PA Forum – which has been the national event devoted to updating the Public Administration since 1990 – "for the interest and innovation of the proposed solution".

Success factors

Using the board game mechanics highly contributed to engage all participants, to create a comfortable environment for discussion and exchange, and to make concepts and information less complex, as well as more understandable and interesting.

Limitations

No limitations proved particularly significant in the development and management phases of the project. The "novelty effect", and an initial mistrust about how to run the game and its training mechanics, were immediately offset by the user-friendly design ofthe platform.

Related resources

- https://tabletopia.com/games/summit2030
- https://progeu.regione.emilia-romagna.it/it/faircities/2020/summit-2030-un-nuovo-gioco-per-conoscere-lagenda-2030

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FINAL ASSESSMENT

Efficacy — ★★★★★
The project proved highly effective since it managed to combine usability and amusement by favoring relations, brainstorming, and cooperation activities.

Transferability — ★★★★★
The game can be easily used and transferred to other contexts, without any technical or app-related impediment

Usability — ★★★★★
The game design and its learning paths are able to convey information and concepts in a simple and effective way.

Playability — ★★★★★
The game is extremely user friendly, fun, and easy to set up. Anyone can learn how to play in minutes.

Innovation — ★★★☆☆
It's not very innovative in terms of game mechanics and dynamics, which are very conventional, but its design is highly interactive.

Inclusion — ★★★★★
The game is designed to be used by people with different skills. Its user-friendly design, ease of use, and the features common to many other board games, make the experience accessible to all players.

Efficiency — ★★★★☆
The game mechanics and dynamics contributed effectively to achieving the desired results, both in terms of involvement, the quality of the experience, and the degree of customer satisfaction.

Ecosystem Diversity — ★★★★★
The game can easily be used in different contexts and areas.

Low   High

7. Pacific Review

Title	Pacific Review
Date	2020
Authors	Bocconi University
Geographical scope	Italy

Partners/Stakeholders

Simone Autera, Supervisor of a course called "Movie Industry" included in Bocconi University's Master Degree in Economics and Management in Arts, Culture, Media and Entertainment in collaboration with BUILT (Bocconi University Innovations in Learning and Teaching)
Technical partner: OpenLab, an independent Italian design Studio.

Target groups/Beneficiaries

Students of the "Movie Industry" course as part of the Master Degree course in Economics and Management in Arts, Culture, Media and Entertainment at Bocconi University.

Context

While discussing the world of work, one aspect on which Universities are focusing again is the improvement of so-called soft skills. Where and when possible, university laboratories are increasingly adopting an online approach. Indeed, the digital environment is increasingly becoming a useful space for the teaching-learning process and for structuring interactive storytelling. In this rapidly evolving scenario, even video games can be used, not being limited only to entertainment but, thanks to their high motivational and interactive potential, these games can also be incorporated into teaching and training programs.

Objective

The objective of this business game is to teach students the concepts of economics while the didactic process becomes an enjoyable experience. The simulation process aimed to create a different way of teaching/integrating academic classes, to let students be more engaged in the learning experience and appreciate more what they are studying.

Process

Pacific Review, coded in Unity 3D, is the name of an adventure game developed for the "Movie Industry" course combining elements of corporate strategy and elements of negotiation that would normally take place in a classroom setting, starting from a real case-study, namely the acquisition of Pixar by Disney. In the game, each student pretends to be a reporter who is tasked with uncovering the details of the transaction.
The game is set in the editorial office of a newspaper, the Pacific Review, whose director

assigns a new collaborator the task of finding out more about this important transaction. The reporter, in other words, each student, must go through a series of events aimed at collecting qualitative and quantitative information. The game replaces the classic interpretation of the case, enabling new forms of learning. Students must often decide which path to take, how to solve problems and challenges while searching for and collecting information. This stimulates students to question the truthfulness and value of data, but, above all, to build a self-learning path by themselves, interacting freely with different people and sources.

The information is collected in an agenda called "the reporter's notebook" and is used to tackle the subsequent phases. Needless to say, the game is not limited to making choices between two possible options of equal value, rather it provides the opportunity to choose the most effective research paths among a broad range of options. Furthermore, while some information is shared with everyone, others are reserved for those who make the best decisions. Eventually all characters compare and align all information collected with other users. This phase of the game leads into the next one, in which the students, split into two groups (Disney and Pixar), will pretend to be negotiators.

Results

The feedback was positive and students felt more involved in all phases of the project. Furthermore, the results showed a qualitative increase in the understanding and analytical skills of the students.

Impact

The experience proved to be particularly interesting as regards the level of interaction shown by the students, and the amount of concepts learned, to the point that BUILT (Bocconi University Innovations in Learning and Teaching) is already creating other simulation games to be included in other courses.

Success factors

The game replaces the classic interpretation of case studies, increasing the understanding and analysis skills of students who find themselves living a creative training experience that stimulates their critical capacity, promotes greater involvement, and boosts decision-making skills. Empathy is the key to everything. The game allows you to deep dive into scenarios and settings that are difficult to represent in reality and in doing so you can put yourself "in others' shoes", act as the protagonist and learn by living the experience first-hand.

Limitations

The game dynamics are simple and intuitive, useful for those who are less familiar with this genre of games, which tend to be less attractive for more experienced players. They do not require specific technical skill to perform actions and interactions. The interface and graphics of the game components are not of the highest quality, just as the player's experience is rudimentary. The game must be played at the pace of classic exploration games.

Related resources: https://www.viasarfatti25.unibocconi.it/notizia.php?idArt=22426

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FINAL ASSESSMENT

Efficacy ★★★★★
The effective combination of game elements allowed a perfect balance between amusement and learning, leading to the desired learning outcomes.

Transferability ★★★★★
The game proved to be highly effective, as a first trial test in making large-scale gamification part of multiple university courses.

Usability ★★★★★
The not overly complex game mechanics, together with the use of well-known, simple, and interactive formats, have helped to achieve an excellent usability.

Playability ★★★★★
The game is extremely simple, fun to play and can be started immediately. It does not require users to learn technical knowledge or specific rules beforehand.

Innovation ★★★★★
The game is innovative in its ability to generate a powerful impact and growing appeal in an area and an environment in which gamification still struggles to be used regularly in training programs.

Inclusion ★★★★★
Its simplicity, the usability of the app and the extremely simple game mechanics make it possible for anyone to play and access the platform's features.

Efficiency ★★★★☆
The game mechanics and dynamics contributed effectively to achieving the desired results, both in terms of involvement, the quality of the experience, and the degree of customer satisfaction.

Ecosystem Diversity ★★★★★
The app can run on any type of device or browser without compromising or limiting the user experience.

Low   High

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8. uManager

Title	**uManager**
Date	2018
Authors	Institute for Educational Technology - National Research Council Team: Mario Allegra, Giuseppe Città, Valentina Dal Grande, Manuel Gentile, Dario La Guardia, Simona Ottaviano, Salvatore Perna, Alessandro Signa.
Geographical scope	Italy

Partners/Stakeholders

Several partner schools included the game in their learning programs. First and foremost, we would like to mention the "V. Bonifazi" High School in Civitanova Marche, the "Mario Rutelli" State High School in Palermo, "Vincenzo Ragusa Otama Kiyhoara Filippo Parlatore" Art and Vocational High School in Palermo, and the "Girolamo Caruso" Vocational High School for Economics and Technology in Alcamo.

Target groups/Beneficiaries

uManager is a management/construction game designed to enhance the development of entrepreneurial skills and competencies of Secondary School students. It is versatile and can be personalized according to the specific needs of each class and its teachers. The student can play solo or in groups to compete in a common market. The teacher can plan the experimental activity, breaking the class down into groups and setting out the game model in detail. It has proven to be a very effective teaching tool in the framework of the "school-work balance" initiative.

Context

Current research on game-based learning focused attention on how "serious games" could offer new and innovative learning paths through interactive experiences that allow users to improve their knowledge and skills. Notably, these types of games made it possible to contextualize the players experience by allowing them to deep dive into complex and realistic environments, thus supporting situated learning processes; learning was then the result of a dynamic process based on active user participation in a scenario, and its interaction with other players and the surrounding environment.

Objective

The objective of the game was to offer students the chance to acquire and promote an entrepreneurial mindset through the development of attitudes, skills, and competences such as decision making, problem solving and critical thinking. Given the incremental nature of the level of difficulty and game mechanics, which are activated as the player progresses through the game, uManager stimulated the acquisition of a series of soft skills

such as problem solving, text comprehension, management of scarce resources, as well as inference and analysis skills, that players need to develop to use the tools they are provided with in the proper manner.

The player is engaged in building and managing a tourist village. uManager is suitable for use in a classroom setting or via distance learning, in formal and informal contexts. It is effective for PTSO activities (Pathways for Transversal Skills and Orientation) as it promotes immersive and experiential learning. Players gain experience as they go, as if they were in an actual workplace, having fun and being motivated, thanks to the correct balance between the realism offered by the simulated environment, and the engagement generated by the gameplay.

The game is structured as a training course with increasing levels of difficulty, which are unlocked by decision making levers that allow users to manage the village in an increasingly in-depth manner. Each player receives a sum of money, given out as a loan that must be repaid monthly through a 10-year installment plan, and an empty building plot including a beach.

A specific type of customer is also assigned as a target market. The main objective is therefore to meet the specific needs of this target. Furthermore, throughout the game users must face several micro-goals, thus inviting players to ponder various issues related to business management.

The decision making levers can be broken down into the following categories: Choice and construction of buildings (construction, positioning, and possible demolition), Personnel management (hiring, promotions, layoffs), Management of advertising campaigns (choice of advertising channel), Management of sales prices, and Financial management.

As for the accommodation category, a tent and camper areas can be built, as well as one or two-family bungalows, and hotels. To provide catering services, the user can choose between a market, a diner, a bar, a regular or organic restaurant. As for sports facilities, the available facilities include football fields, tennis courts, bowling alleys, swimming pool, and an archery area. In addition, for the relaxation and entertainment category, the amenities and services include beach umbrellas and loungers, a massage area, a space for yoga, a beach hut with a sea view, and a disco. Finally, the category of aesthetic and decorative features includes various types of trees and gardens. Each feature has specific management and construction costs.

Players can advance through the game progress based on two, interconnected parameters: time, as well as the game's level of difficulty and active decision making levers. The system records each action performed by the players, together with the most relevant features that define the village status. This allows researchers and teachers to monitor players' progress and their learning paths, to grasp and analyze the educational impact of the game.

The key to success lies in a proper understanding of the causal connections between one's choices and the game variables. For example, to obtain the best performance from

single services, it will be necessary to understand which categories of employees are most useful to such service, and to acknowledge the relationships between the various professional profiles of employees and their performance.

Results

Over the last few years, uManager has been the subject of various trials involving hundreds of students from some Secondary Schools located in Palermo and its Province. Along with these trials, tests to gauge knowledge obtained by students during the game activity were also carried out. The results showed that players with a higher propensity for critical thinking tended to perform a greater number (in percentage terms) of actions geared towards obtaining information.

As a result, the players who, during the game, performed a larger number of actions aimed at gaining information scored better. Therefore, providing the student with real-time feedback on the correctness or mismatch of the answers given, would have a stimulating role to verify the information, then to develop more critical thinking, understood as the ability to identify and ponder situations, ideas, and information to formulate answers and come up with correct solutions. Through the constant provision of educational content, linked and repeated practice on learning tests, the didactic process could be conceived as an incremental process that gradually grows through study and trials, and a serious game could be the ideal environment to track this learning path.

Impact

The game turned out to be a smashing success among the Institutes that welcomed and implemented this novelty. Further updates, both on the game and its data analytics system, are already in progress; they will make it possible to personalize the learning path and increase the number of gamification assets, in order to make the relationships between types of customers and services more complex and realistic. The goal is to further stimulate skills related to critical thinking through the implementation of dynamic objectives that can guide players in case of bad choices, thus prompting them to think more carefully about decision making and problem solving.

Success factors

Playing in a simulated environment allows students to learn and improve their skills related to the analysis and enactment of a situation that would otherwise be impossible for them to experience. Therefore, students will be able to gradually learn the complexity of the economic and financial systems that they need to master in order to develop a business.

Limitations

The game environment is vertical for the tourist industry. The mechanics and dynamics could instead be used on multiple scenarios, representing the complexity of business management also in other areas and fields.

Related resources

- https://umanager.itd.cnr.it/it/cosa-e-umanager/
- https://www.pa.itd.cnr.it/umanager.html

- https://www.researchgate.net/publication/336030516_The_role_of_disposition_to_critical_thinking_in_digital_game-based_learning

FINAL ASSESSMENT

Efficacy	★★★★★	The project proved to be highly effective since it managed to combine usability and amusement, and above all the ability to experiment and increase target skills.
Transferability	★★★★★	The project, both from a methodological and technological standpoint, proved to be extremely effective as an initial trial to enhance the use of gamification in the field of multiple learning paths.
Usability	★★★★★	The good balance of simple and more complex game mechanics, together with the use of simple, engaging, and interactive formats contributed to the achievement of excellent gameplay.
Playability	★★★★★	The game has a short learning curve. It does not require users to learn technical knowledge or specific rules beforehand. The onboarding phase immediately allows students to understand the game logic and objectives.
Innovation	★★★★★	The game setting, as well as its mechanics and dynamics are able to faithfully reproduce the complexity of managing a well-structured activity such as a tourist village, whose interdependent features make decision making and problem solving extremely realistic.
Inclusion	★★★★★	The simplicity and good usability of the app and the extremely simple game mechanics make it possible for anyone to play and access the platform's features.
Efficiency	★★★★★	The game mechanics and dynamics contributed highly effectively to achieve the desired result, both in terms of involvement, the quality of the experience, and the degree of user satisfaction.
Ecosystem Diversity	★★★★★	The app can be used on any type of device or browser without compromising or limiting the user experience.

Low   High

Surveys Analysis

An online questionnaire was designed **to validate the best practices** collected in game-based learning in the six European countries involved: Spain, Italy, Greece, Romania, Portugal, and Poland. The survey aimed to gather the VET experts' perspectives on the innovative experiences, game dynamics, mechanics, and components researched by the Sparks consortium.

1. Methodology

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The research work followed three main phases:

1. Design of the quantitative research tool;
2. Fieldwork;
3. Data Analysis.

Phase I: Design of the quantitative research tool

The chosen method was categorisation, creating blocks linked to main general research questions and developing more specific research questions inside each block. The development of the survey as a research tool for validation was implemented as follows:

1. all the Best Practices collected by the consortium were reviewed;
2. a log was created to perform an in-depth comparative analysis of the key elements of the practices collected;
3. research questions related to the main points that needed validation from the best practices were developed;
4. the survey questions were developed, based on a 5-point Riker scale, for each research question determined;
5. the survey questions were finally validated by the consortium.

Phase II: Fieldwork

Once elaborated, the online survey was disseminated by the partners. In Italy, 50 responses were collected.

Phase III: Data Analysis

1) *Recollection* of the data obtained with the survey.
2) *Disposition* of the data. In this Report, the responses obtained were organised to be further analysed in the Final Report of the research, comparing the results of the six countries of the consortium.
3) *Analysis* of the data.

4) Drawing *conclusions* based on the results of data interpretation.

Phase IV: Final Document elaboration

The last phase of our comparative research is developed in the Final Report, where the consortium analyses the results of the desk research in Best Practices in GBL together with the results of the validation survey performed and the results on the Focus Groups research the needs in VET.
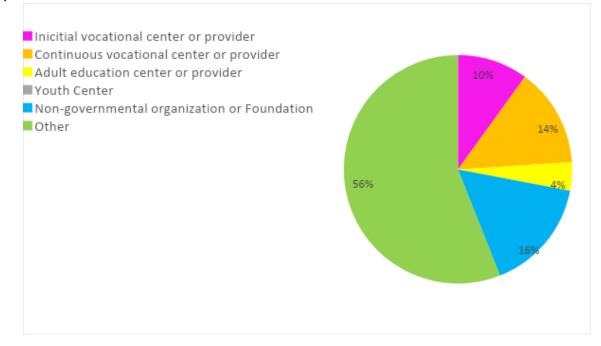
2. Survey Results obtained in Italy

The first block of questions aims at obtaining a **general picture of the target group of educators**. It includes essential information, such as:
- the type of entity the expert belongs to, including initial or continuous vocational center/provider, adult education center/provider, youth center, non-governmental organisation or foundation and other VET providers;
- the job position occupied, including teacher, coach or mentor, trainer, coordinator, administrative staff, management role, social educator or worker and other.

<table>
<tr><td>50
Responses</td><td>06:31
Average Time for completion</td></tr>
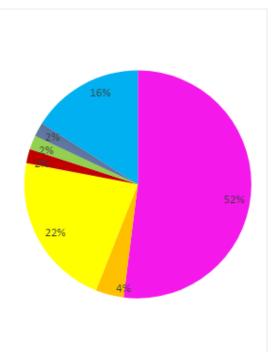</table>

Type of **entities** the educators work for:

The different **job positions** occupied by the people surveyed:

The following questions belong to the second block that responds to the objective of achieving a general picture of the overall level of **competencies of VET experts** in digital skills and ICT tools and platforms, and more specifically their level of competencies in **game-based learning**.

3.   I think that incorporating ICT tools and platforms into teaching pedagogies is beneficial for teachers and students.
4.56   Average
4.   I feel confident that the competencies of educators (including myself) in digital competencies is sufficient to incorporate ICTs into teaching.
3.32   Average
5.   I often implement game-based elements in my teaching/training to assess students or increasing their involvement during classes.
3.38 Average
6.   I do not use gamification into teaching, but I would like to.
3.55   Average

The objective of the third block of questions is to **validate the best practices collected**, and particularly the game elements that were found as the key to the successful game-based learning experiences.

7.   Establishing the objective of the game and the rules previously and explaining them to students before starting the experience.
4,48 Average
8.   Defining previously the possible roles of users in the experience and, if relevant, including the possibility of having different roles: active y passive (observer); leader and followers.

4,1 Average
9.   Using platforms and digital tools for the gamification experiences that are commonly used and recognizable by teachers
4,45 Average
10.   Including an attractive narrative and, if possible, maintaining the storyline defined during the game and till its finalization
4,5 Average
11.   Stablishing clear levels in the game experience that gradually became more difficult, with the aim of continuing to challenge users.
4,38 Average
12.   Including the possibility of feedback between students and educators during the game, specially at the end of a challenge or level.
4,62 Average
13.   Including challenges and tasks that must be done individually and in teams, to foster both teamwork and autonomous work.
4,67 Average
14.   Adding the option for the user and the educator of viewing the progress during the game or gamify experience since the beginning (i.e., using avatars or profiles to identify each user and show their progress)
4,3 Average
15.   Including access to educational material or additional information in the hosting platform of the experience (i.e., videos, tutorials, curricula, etc.)
4,56 Average
16.   Including graphics, visual elements, music, and videos that are stimulant and attractive for the students.
4, 64 Average
17.   If the objective of the experience requires it, include simulation scenarios (i.e., job interviews) to foster learning by doing.
4, 52 Average
18.   If the objective of the experience is to evaluate students, previously stablish the criteria and make the students aware of those criteria and objectives chosen.
4,42 Average
19.   Stablish a reward system (i.e., Points system, ranking, badges, insignias, etc.) that motivates students, but also rewards different qualities such as behavioral attitudes (curiosity, helping other students, devoting more time)
4, 52 Average

The last block constitutes an **open-ended question** to allow the surveyed person to make a remark, share an experience or state an opinion about Game-Based Learning.

20. Would you like to share any past or present experience with Game-Based learning techniques, tools, or methodologies? You can do it below:
8 of the total of 50 Italian education providers surveyed answer

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COLLECTION OF COMMENTS
I explained the phases of a validation project for an automotive product using point-based games per each step, engaging all the participants, and stimulating them with the game. The experience was really positive and learners were highly motivated. Participants commented: "We could experience practically what you told us".
Not at the moment.
Not at the moment.
When I introduced storytelling in a class assignment aimed at promoting/marketing some products chosen by the students, the students dedicated themselves to the task with enthusiasm and passion
Role playing
When I introduced coding in my classroom, I used the CODE.org platform, and Scratch, but even if it was stimulating for some students, for many it was not productive and constructive enough. As part of the mathematical analysis program of the fifth year of high school, I tried to build a scenario of a fantasy story with a map, characters and roles assigned to the students, but the project could not be completed due to: the little time available; the lack of real planning that would have taken a long time before the work in the classroom; the burden of the program to carry out; the perplexity of the students.

3. Final Conclusions

The surveyed persons, averagely moderately confident about their digital competencies aware of the benefits of game-based learning, and implementing game elements in their teaching and training practices, validated all the mechanics, dynamics, components, and pedagogical techniques of the best practices collected by the Sparks consortium: all the elements of the best practices identified were averagely rated higher than 4 out of 5.

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Focus Groups Analysis

Each partner organisation implemented a Focus Group with a minimum of 24 participants: 12 educators and 12 students in the field of Vocational Education and Training.

1. Methodology

A common questioning route was developed for the implementation of the focus group. Each partner implemented its focus groups at the local level following the common questions outlined by the project team to reach the goals of the qualitative analysis.

The questions aimed to gather the target groups' needs, such as pains in their current e-learning practices and jobs-to-be-done, possible gains deriving from the platform, and the features and game elements they would find more effective and engaging in Game-based Learning Programs.

A moderator and an observer were involved in the implementation of the activity.

2. Report of the Focus Groups. Analysis and comments

2.1. Focus Group 1: Vet Teachers & Trainers

PARTNER ORGANIZATION	Lascò Srl
DATE AND HOUR 09 September 2021, H 18.00 - 19.30	**PLACE** Google Meet
FORMAT: Online	
PARTICIPANTS: VET teachers and trainers	**NUMBER OF PARTICIPANTS:** 12
MODERATOR: *Mr Gianluca Abbruzzese*	**OBSERVER:** Ms *Miriam Lanzetta*

Composition of the group
▪ **Professional background** The group was composed by: - no. 2 teachers of State Technical and Vocational Schools; - no. 3 trainers of private vocational training centers; - no. 2 in-company trainers; - no. 5 trainers working for nonprofit training providers.

![Sparks logo]

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▪ **Gender and age**

The group included eight women and four men, aged from 35 to 58 years old.

▪ **Motivations to attend the Focus Group.**

- Learning more about new teaching and training models and approaches that can prepare students for the future challenges of the labour market and, in general, to those related to everyday life.
- Exploring how to create new learning experiences that can radically change the way of conceiving teaching, enhancing the uniqueness of each student with their needs and learning characteristics, in order to be able to educate or make their vocation and talent flourish, abandoning the classic training programs based on common standards and not very flexible to the characteristics of the class.
- Curiosity about gamification and game-based learning, since games and game elements are increasingly perceived as indispensable tools to activate virtuous behaviors that favor the acquisition of new knowledge, which can trigger more solid relationships between peers and between teacher and learner, as well as develop transversal skills.
- Sharing and exploring, in a fertile environment, opinions, experiences, and issues related to their professional practices.

Q1	1.1. Do you have any experience with gamification and game-based learning? Have you ever applied game elements to your lessons or sessions?
	1.2. What **positive and negative aspects** did you realize during these experiences?
NOTES	
The professionals involved in the focus group represented different sectors: State schools, private vocational training centers, companies, and nonprofit training providers: different points of view, needs and experiences that proved to be extremely complementary and that gave a broad and detailed overview of the needs of the world of Vocational Education and Training in all its fields and contexts of application. Most of them tried to include online gamification tools during the pandemic to make distance learning more engaging for their students. In relational contexts where the physical presence is lacking, many teachers have experienced the need to create training environments and experiences where they can connect emotionally with their students, transfer authenticity and trust even without direct contact.	
COMMON RESPONSES	
The group identified an existing growing interest around games in education, not only for teachers and trainers, but also by parents, students and policymakers. Games are considered effective learning tools because they put students in complex problem situations designed to provide learning "here and now".

Great attention has been shown above all to the ability of games to create a stronger impact than traditional teaching, relying on the motivation and desire of the learner especially on the part of the youngest who see in the game the possibility of living new | |

experiences in line with the main aspirations and the languages of daily use, not a trivial pastime but a tool to understand and measure one's skills by applying them in different scenarios and contexts.

The collected testimonies highlighted the use of game mechanics in some social training projects to combat phenomena such as cyberbullying and violence against women. In these contexts, the application of game mechanics was inserted to guide the participants to an in-depth investigation of the reason for certain behaviors, analyzing the causes from multiple perspectives, with a less deductive and more abductive approach that aimed at revealing the root and the root causes by formulating different hypotheses and verifying them, an approach inspired by some detective games and board games.

The same result was recorded when applied by trainers in training courses of disciplines such as project management, in employee training on safety and in technical training, to overcome the theoretical aspect and mitigate an overly analytical rational approach, with a creative and intuitive component. the game has lent itself well, in the cases analyzed, to create a more dynamic, less cold, contextualized learning context. Attention has changed, the language has changed, and above all the ability of learners to decline skills and knowledge in complex situations closer to reality has changed.

Even in the industrial world where the false belief of thinking about gaming as something related to the world of childhood and adolescence is still strong, after having lived experiences with game-based learning and gamification, professionals have changed their minds because they have perceived the ability of the game to develop the ability to make difficult decisions and solve complex problems.

What emerged during the discussions was the importance of the game in bringing out the team spirit, of learning to work in a team and above all the strengthening of the confidence of the individual who perceives his key role in the group for the achievement of a common goal. Furthermore, according to many, the game has its peculiarity in being able to create a more fertile and receptive environment especially in multi-potential individuals, creative and highly curious subjects, who find in the play experience that sense of progressive challenge that keeps their interest high towards the learning path and, above all, the ability to recognize one's uniqueness often stifled in those conventional paths that tend to excessive specialization and do not enhance the emotional aspect and one's ability to integrate one's own arguments and knowledge.

Underlined by many professors and trainers, the difficulty of measuring skills, especially transversal, of how the mapping of these skills plays a fundamental strategic role in any organization. Only from a definition of the soft skills of the learners it is possible to implement a training plan structured around the characteristics of each one, personalizing the topics and tools, neutralizing the pitfalls linked to a path where techniques and personal skills are intertwined with intimate conflicts and often not made explicit by learners.

| Q2 | 2.1. Do you appreciate gamification and GBL in education and training? Do you think games add a positive input to learning? |
| | 2.2. How, in your opinion, gamification and games can enhance learning? |

NOTES
All the attendees appreciate gamification and game-based learning in education and training. Half of the members of the group had already implemented game elements in their classes or used online learning games, while the other half had never applied gamification or GBL but had a general knowledge of both of the concepts. The whole group believe in the positive inputs games can add to learning for the following reasons: - creation of a context of shared rules that favor teamwork and collaboration; - increase of students' engagement; - increase of students 'motivation; - improvement of the relationship performance-learning; - formative usefulness of the mistakes; - increase of attentional skills; - development of students' soft skills; - reducing students' resistance to the stress related to the learning experience.
COMMON RESPONSES
The idea of a stronger relationship between education/training and gaming processes is strongly desired by almost all the interviewees, precisely because of the possibility of bringing out the *affordances* of the training path and its goal of increasing student performance. Not only. According to many, the introduction of gaming elements in education training can help reduce the cognitive fluency of learning, teach pupils to activate and manage mechanisms of decomposition and management of complexity (especially in decision-making and problem solving), reduce and manage information overload, learn to control the application of cognitive bias and other mental "shortcuts". The dynamics of relationships between groups of students can be extremely fruitful both in activating the principle of reciprocity among students, i.e. the personal rule of trying to repay, at least in part, what another person has done for us, and in generate greater awareness and recognition of the contribution of the individual within the dynamics of the team. Many have stressed how the game is important to develop students' curiosity and guide them in a creative process that pushes them to find new solutions and models for responding to situations and problems to be faced. Increase engagement because the novelty effect, the sense of challenge involves feeling constantly involved, and, above all, the game fascinates because you don't know what is going to happen. When something does not fit into the regular patterns that our brain recognizes, it engages and pays attention to the new situation it faces. The game helps our semantic ability to interpret the information we encounter. In fact, many interviewees underlined how the dynamics of games lead us to "connect the dots" and make our actions, decisions and choices consistent, overcoming personal and external pressures that could lead us to fall into contradiction and abandon the path taken. . One of the most appreciated features inherent in many games is the game's ability to legitimize error and failure as fundamental learning moments to reach the finish line. In this case, many have suggested designing the error in the various paths and levels of learning

precisely to accustom students to negative experiences, learning to recognize their mistakes and activate new behaviors to avoid them in the future.

Q3	3.1. Do you believe you and your colleagues in VET have the resources to implement gamification and GBL?
	NOTES
	The education and training words are facing a transition period that is radically changing their foundations and that is leading to the growth of new approaches to education and training that require new competences for VET providers. For private and public VET entities and policymakers, investing in contributions to new methodologies and technologies for didactics is not enough anymore: they need to focus their attention also on training systems capable of addressing the continuous development and improvement of teachers and trainers' skills, to meet new challenges, needs and education goals. VET teachers and trainers perceive themselves increasingly more as facilitators of students' learning processes rather than exclusive guides for the acquisition of new knowledge and competencies, and games and game elements are considered to enhance the accomplishment of this action. Still, a paradigm shift requires VET providers to acquire new skills to develop or improve knowledge of methods and tools to use game and game elements in learning contexts.
	COMMON RESPONSES
	- There is the need to reinforce the knowledge of more advanced game dynamics and mechanics, in order to overcome the traditional basic Point-Badge-Level (PBL) Model and exploit deeper the potential of gamification. - More methodological resources are required to support teachers and trainers to apply the right games and games elements to diverse learning contexts and target groups. - There are some resources online, but often they cannot be customized or used after a short free-trial period without becoming costly.

Q4	4.1. What digital tools and platforms do you have access to/knowledge of?
	4.2 Do you believe VET teachers and trainers, including yourself, have the necessary digital skills to integrate more digital tools into their teaching practices and to support students with their own gaps in digital skills?
	4.3 Do you believe you need more support regarding digital instruments?
	NOTES
	While five participants had a basic knowledge of digital technologies, seven participants were already experienced in the use of more advanced digital tools in their work. All of them, though, during the pandemic have been seeking to improve and update their digital pedagogical competence, searching for best practices, courses and new tools. All the attendees were regularly using the most common tools to produce and organize simple documents and presentations (mainly Microsoft Office), although only 5/12 participants were using more advanced functions of the same tools or know how to use diverse professional tools.

- Most participants were using digital technologies for communication purposes with their colleagues, support staff, learners or parents, but only 4/12 used collaboration tools to work on joint projects together with their colleagues.
- Most participants were able to use search engines to search, identify, assess and select digital resources to use in their classes.
- Most of them learnt how to organize, manage, and run online lessons and meeting only during the pandemic, but they already had experimented some online tools to create interactive assessments online (mainly Kahoot).
- All the participants used frequently the Internet to update their knowledge and skills.

COMMON RESPONSES

- Most of the attendees stressed the importance of deepening their knowledge of digital tools, not so much in terms of functionality but rather in adapting and tailoring their use to specific learning environments and content. Many teachers, in fact, revealed that during the last two years' remote lessons they failed often to instill the necessary degree of attention and engagement in students, because the dynamics of traditional face-to-face lessons were altered in the context of disruptive changes and new on-screen relationships with their students, continually disturbed by connection interruptions or other technical issues related to the use of new tools. Engaging students was particularly challenging: the duration of the lessons and the methods of explaining the contents proved also to be particularly unsuitable for the online dimension, compared to carrying out normal class activities. For this reason, in addition to enhancing digital tools and skills, the attendees identified the need of reviewing the way learning content are created, as well as the relationship dynamics, toward dynamics that are more in line with the characteristics of the new technologies and tools used.
- One of the gaps many shared is related to data analysis: most of the participants don't know how to effectively gather and manage data online to analyze students' performances and lessons' effectiveness. They don't know neither what metrics they could track, nor how to eventually track them.
- Data integration is considered to be a challenge too. Teachers and trainers have been using multiple and diverse digital platform and tools: information and data is often too fragmented across different virtual spaces.

Q5	Would you consider a gamification platform useful to support you in gamifying your classes?

NOTES

For all the attendees, a gamification platform can be useful if it doesn't require technical skills or game design skills and if it delivers gamified experiences that can favor learning and adaptive development, tailored and customizable around the needs and requirements of each group of students.

COMMON RESPONSES

Most of the participants highlighted the importance of "adaptive" games or gamified learning experiences. Many VETs emphasized not only the importance of accepting that error and frustration are natural steps to reach new goals and discoveries, but also the importance of leaving the students the necessary time to adopt new behaviors and complete the planned activities in compliance with the deadlines. It is also important to map the results of the class in an aggregate way, to try to understand how to improve, which initiatives and activities have brought positive results, with the possibility of introducing small changes (for example, mini-games with clear and measurable objectives) and observing the impact on the class by

leaving students more choice and action. The feedback provided by teachers on school performance will no longer be limited to grades, report cards and evaluation forms, but will be enriched with complete mapping of deeper and more analytical skills and knowledge. Learning will not only impact on technical knowledge and skills but will be increasingly considered as a fundamental moment in the life of children to acquire noetic tools to build their own identity, reinforce values and attitudes, build a common culture, guide choices and opinions through the semantic ability to read situations and contexts, motivate oneself to change.

For many, the gradual introduction of the game in learning contexts will be fundamental. Many suggest proceeding first by gamifying individual contents, then individual exams and then the entire process.

2.2. Focus Group 2: Students

PARTNER ORGANIZATION	Lascò Srl
DATE AND HOUR 10 September 2021, H 18.00 - 19.30	**PLACE** Google Meet
FORMAT: Online	
PARTICIPANTS: VET students	**NUMBER OF PARTICIPANTS:** 12
MODERATOR: *Mr Gianluca Abbruzzese*	**OBSERVER:** Ms *Miriam Lanzetta*

Composition of the group

No. 6 students of Technical and Vocational Schools
- Gender: 5 males and 1 female.
- Age: 16-25 years old.
- Interest in games*: *High* for 4/6 students, *Moderate* for 2/6 students.
- Stated motivations: share ideas and opinions on how to make the use of games more frequent in their classes; meeting new peers and learning more about the practices and activities in other schools; exchange observations and perspectives about education with students who are in a further stage in their education pathways.

No. 6 students of VET centres and nonprofit organizations offering qualification and professional specialization courses
- Gender: 4 females and 2 males.
- Age: 22-31 years old.
- Interest in games: *Moderate* for 3/6 students, *Low* for 2/6 students, *High* for 1/6 students.
- Stated motivations: share and discuss experiences with gamification; understand how the use of games could help improve their learning experiences; contribute to an international project; learning more about gamification and experiences with game-based learning; curiosity about new ways of approaching learning.

Q1	1.1. Do you have any experience with gamification and game-based learning?
	1.2. What **positive and negative aspects** did you realize during these experiences?

NOTES

All the participants had experience with gamification, at least with basic applications of game mechanics into their education or training path, such as challenges, rewards, and competition, mainly with learning games aimed at assessing knowledge and learning outcomes. However, these experiences were primarily related to single episodes delimited in a few lessons or multiple sessions during specific gamification-based projects.

Concerning game-based learning, four of the attendees had at least one experience, specifically no. 3 students and no. 1 former student of Technical and Vocational Schools, who participated in extracurricular projects where they had the opportunity to acquire and test knowledge and skills through online games built specifically for the workshops they were attending, focused on communications and journalism, and graphics.

During the discussion, most of the attendees identified the impact that the pandemic had on the innovation of their schools and vocational centres, particularly on the innovation of their traditional teaching and training models: most of the participants identified a more significant push towards the introduction of new and diversified digital tools into their classes, and some of them had never experienced gamification before the pandemic came and required their teachers and trainers to adopt innovative practices to engage and motivate students, challenged by the pandemic.

COMMON RESPONSES

Positive aspects
All the attendees declared themselves highly enthusiastic about their experiences with gamification or game-based learning. The use of games, game dynamics, mechanics, and components in the education or training path:

- was crucial to feel more engaged in learning;
- helped overcome the challenges related to the acquisition of new concepts;
- make them feel proud of the results obtained and of what they have learned;
- stimulated positive competitiveness with themselves and with their classmates;
- favoured the sense of novelty and fun, linked to the activity itself;
- increased ability to visualize their goals and milestones, as individuals and members of a team;
- a growing motivation to achieve the micro-goals on their path while progressively reaching each milestone.

Negative aspects
The main negative factors identified by the participants in their experiences were:

- low diversification of game scenarios or a poor variety of game elements, which generates repetitiveness and predictability of the contents and decreases interest in the experience;

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- "unchallenging challenges", too simple for the target, making rewards unmeaningful for the student;
- low-quality visual design reducing the attractiveness of the experience;
- chances to cheat and lack of transparency in online gamified or game-based learning experiences, leading to discouragement and loss of interest in the experience for the fair players.

Q2	**2.1.** In general, do you **appreciate** gamification and game-based learning experiences? Do you think games add a positive **input to learning**?
	2.2. How, in your opinion, gamification and games can enhance learning?

NOTES

85% of the attendees stated their belief that the quality of their education and training experience and their productivity would increase if their schools and centres integrate more organically gamification experiences or game-based learning in their programs or courses. Most of the students suggested that game-based learning should be an adaptive and personalized learning experience, able to balance the game dynamics, the player/student's ability, and the content to be learned so that all learners can gain and retain more of what they study and can apply it to real life. Many testimonies shared during the discussions have brought to light how, thanks to games, the relational dynamics within their teams and classes improved. What emerges is that by enhancing the ability to cooperate in a group, students feel stronger, free to offer their creative contribution, more likely to overcome their weaknesses, thus creating an efficient, dynamic, and productive learning environment.

Considering how often the traditional learning experiences, as well as many relational dynamics, especially online among young people and on social networks, push in favour of greater individualism and polarization, the game has allowed not only to enhance the individual uniqueness of each learner (approach, experiences, ideas, knowledge) but, through cooperation, it was possible to enhance the actions and ideas of the individual towards a common and shared goal. In summary, thanks to the game, the impulse to self-realization and self-affirmation is mitigated by the group's presence. Furthermore, the mutual support between the students, which is usually manifested through the exchange of information, notes, and communications, is amplified with the game, through the sharing of necessary and complementary information, without which it is not possible to complete a challenge, access a benefit or to achieve a common goal. Most of the attendees who experienced cooperative games, especially in courses aimed at acquiring computer skills, stated that the cooperation dynamics played an essential role in their experience. In cooperative games, every individual can have fun and participate in an environment where they can find acceptance, mutual knowledge and harmony, a sense of community, and a better balance with the group. On the other hand, the group can always find new common goals to be achieved by creating a climate of mutual trust and respect in which everyone's self-esteem can grow.

COMMON RESPONSES

How gamification and games can enhance learning
- *Better quality of the interactions with peers*: the joint development of strategies toward common goals, and the frequent interactions it requires between students, is considered by the attendees helpful to "build a team", to reinforce or discover new ways of working and learning together with their peers.
- *Increased motivation, commitment, and assimilation of concepts*: students feel more involved in the learning activity and perceive it is easier to retain new concepts. All of the students agree on the tendency to learn mechanically and

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acquire increasingly complex concepts without building relationships between them or models immediately reflected in reality. When using games or participating in highly interactive gamified activities, they could identify they were learning more naturally due to the involvement of emotions, relational and cognitive skills. Furthermore, their self-esteem and self-confidence increase while visualizing completed objectives and progress in the game, which give a sense of satisfaction and personal fulfilment.

- *Solving problems creatively*: most of the attendees focused on the ability of games to stimulate creativity and curiosity. When facing a problem during a game, they enjoyed findings solutions by combining in original ways the "pieces" collected over time from the most disparate sources and thanks to the practice of several soft skills, such as teamwork, concentration, patience, memory and abstraction skills.

  These experiences led to learning to be more curious and, therefore, to nurture a greater, sincere interest in the topics and knowledge to be acquired and learn to ask questions and dialogue with others to gain access to new information.

- *A balance between individual work and teamwork*: for many attendees, the path must not be limited only to cooperative games but should balance the opportunities to learn alone and in teams, with both "single and group missions".

Q3	What do you think are the keys to enhance and improve gamified or game-based learning experiences in VET centres?

NOTES

As digital natives, students not only learn how to use technologies and digital languages since their first years in education but also consider the online and offline worlds more a unique rather than a divided reality, where the vital, relational, social, working, and economic dimensions are perceived as the result of a continuous interaction between the material and analogical reality and the virtual and interactive reality. Furthermore, the extensive evolution of video games, particularly online gaming, has amplified the frequency and time of playing among young people, which is experienced not only as an evasive but as a formative experience of discussion and exchange. Therefore, not only it was identified a need for more sustained use of digital in the education and training, but also to exploit the game to enhance particular skills such as learning to learn, the ability to move in different learning environments and context, and acquire different and complementary skills. To search, sift, interpret and understand new information, today thanks to the accessibility of the Internet to almost everyone, analysis and critical thinking skills are needed, but also emotional levers such as feeling ignorant and striving to fill personal gaps, the ability to abstract and conceptualize, check their cognitive biases. Furthermore, since most people face a massive possibility of access to new information, it is necessary to develop the skills to manage autonomously their own learning, such as the ability to analyze the quality of the data acquired, analyze and interpret them critically and above all make them consistent with knowledge already gained.

COMMON RESPONSES

Keys to enhance and improve gamified or game-based learning experiences

- Rethinking teaching and training methods, designing new learning content and contexts that support the application of game-based methodologies.

- Increasing the frequency of these experiences, both in offline and in digital environments.

- Integrating games or game elements into flipped classrooms.

The attendees consider the use of technology and game elements a facilitator for the transition from the traditional frontal lesson to a relational lesson. All the attendees had experienced at least one flipped classroom experimentation or, more frequently, online research assignments, where they were required to act autonomously within protected digital environments, where materials and resources to learn were available, having the responsibility of managing their learning to get prepared to share the results of the process in their classrooms with peers and teachers/trainers. These experienced led students to weave a logical thread between the several contributions brought by themselves and their peers, making knowledge development a co-creation process and changing how the student is evaluated: no longer on the sole knowledge of the content, but on their ability to deepen, reason, compare, relate, and listen. In this frame, games can be the necessary engine to optimize the learning context and stimulate cooperation.

- Avoiding too competitive contexts.

All the attendees agreed on the risk that an unbalanced use of game dynamics and mechanics could lead to unhealthy competition, risking leaving behind those students who are challenged by the fear of being continuously judged based on their results visible to all and by performance anxiety caused by the feeling of being constantly in a competition with someone. Some of the attendees also proposed reducing the number of students in the various challenges and games to decrease the complexity of the interaction between all the participants.

NOTEWORTHY INDIVIDUAL RESPONSES AND IDEAS

Another relevant factor that emerged from the discussion of this topic is the potential of the game to favour the management of distributed knowledge. Through games and the new dynamics of the teacher-student and student-student relationship, we move from acquiring an object-oriented knowledge (a single topic, a document, a subject, a source) to a modality "in relation to", that is when a student has to learn to manage their ability to connect and learn to connect multiple objects and subjects. The information is not acquired only from the interaction with well-defined objects (the chapter, the book, the video). Still, it is built in the relationships, interactions, and integrations that students draw between themselves, the sources, and the tools.

This new dynamic is seen by young people as a huge challenge but, above all, as a huge opportunity to acquire more perspectives. At the same time, however, the freedom of not having a guide in the selection frightens the excess of heterogeneous sources, the absence of an "objective" vision that acts as a compass in case of too contradictory opinions and points of view.

To overcome this pitfall, some of the students suggested using keywords/orientation tags and guided paths to access sources, suggestions and prompts, in order not to lose the focus of information research and undermine the ability to reach the goal. In addition, some ideas were drawn from the analysis of some mechanics of famous board games, such as Taboo, from which we analyzed the possibility of using negative words (as terms or phrases that we do not

want to be associated with the desired results, a topic, a search), as well as rewards to those who process and interpret the information.

Q4	**4.1** Which digital tools for e-learning or distance learning do you have access to/know of?
	4.2 Do you believe you have the necessary digital skills to use these tools?
	4.3. Do you believe you need more support to use digital tools?

NOTES

A vast portion of students' time is on the Internet: to participate on social networks, communicate with their friends, support learning, listening to music, watching videos, movies or tv shows, or playing online. They know how to use search engines and social networks to get information and use them to look for answers to their questions. However, they find many different answers and cannot always evaluate critically and autonomously their quality and reliability to identify the reliable ones. The discussion of this aspect led to the identification of widespread knowledge among their peers of how to make the Internet work basically, but a lower awareness of the importance of never stop questioning its results. This gap is reflected in how they are used to getting informed on events and facts and the sources and contents they choose to support learning.

COMMON RESPONSES

- Most of the students had their first experience with online collaboration tools during the pandemic. They learnt how to: participate in online meetings on Microsoft Teams, Zoom and Google Meet; use a virtual whiteboard; upload and share files in Microsoft Teams and Google Drive, collaborating with their peers on spreadsheets, presentations, and documents also in real-time. They perceived their competencies to be enough to use the essential functions of these tools and enough to complete the assignments requested by their teachers or trainers. However, only 25% of Vocational and Technical school students, and 40% of the older attendees, autonomously experimented with more advanced functions, believing in the usefulness of mastering these tools to improve their education path or to comply with the requirements of the labour market.
- Mobile-friendly tools should be favoured, according to the participants. While all of them and their classmates have a personal smartphone, not everyone had a computer or a tablet available at home to participate in the online activities during the pandemic. Hence, the attendees reported the importance of accessing online resources or materials or doing classwork also from their mobile devices.
- All the students stated they feel confident about their basic digital skills and competencies: using multiple devices, connecting to the internet, using search engines, participating on the main social media, communicating via email, filling in online forms, and finding solutions to simple problems using tutorials.
- Although they are aware of the most common best practices to keep passwords and data secure, most believe there's a gap in knowledge and skills needed to set more advanced security settings that can make them feel safer in the cyberspace.

NOTEWORTHY INDIVIDUAL RESPONSES AND IDEAS

- One of the attendees, drawing from a direct experience, identified an obstacle in the poor timely support teachers and trainers could give in the event of uncommon technical and functional issues that single students may encounter with the online platforms or tools used to gamify the lessons or courses. The participants discussed and proposed the provision of a comprehensive set of support resources not only for teachers and trainers but also for students to enable them to

contribute to the timely resolution of any technical or functional issue that could arise. The ideas proposed included a community-driven Q&A section on the platform. Users can ask questions, find and submit answers on specific matters, earn points for the answers labelled as helpful, and level up in the community.

- During the discussion of the experience of one of the attendees, a Technical school student, with a cycle of assignments during a Journalism Workshop that required students to collaboratively search and integrate online additional information resources on specific topics to elaborate news and earn points to level up to "Citizen journalists progressively", an issue emerged, considered to be recurring by most of the Technical and Vocational school students and some students of the other Vocational Training providers: students often limit their online search field to the first results on Google, and therefore end up to acquire information mainly from the same single sources, neither integrating them with others nor questioning the accuracy of the information. A mechanism suggested by the attendees to address this criticality in similar assignments was the attribution of extra points to the heterogeneity and completeness of the sources.

What could we do to make Sparks' gamified learning experiences attractive for students like you?

NOTES

During the focus group, we analyzed the mechanics of some of the games students considered of particular interest to identify those that could be used in education and training activities and modules. All the attendees shared individual experiences with video games or board games they enjoy the most, stating their reasons and what they believe could be effective in a learning experience.
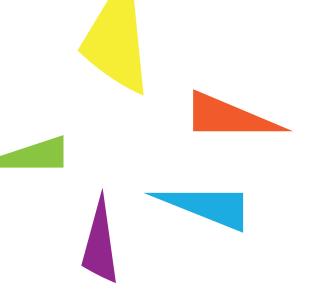
NOTEWORTHY INDIVIDUAL RESPONSES AND IDEAS

- Drawing inspiration from some puzzle games, a student shared a possible pathway to balance individual and collective effort in the learning experience: to advance in the game, users may be requested to overcome cross-tests, as various challenges require alternately individual and team intervention. While discussing this idea, other students proposed structuring a mechanism that bases the passing of a level or the completion of an activity on the combination of individual tests that, combined with all those of the team, generate the completion of the level.

- Analyzing adventure games, the idea to predict the completion of a learning level following personalized paths and clues emerged. Commonly the graphic adventures, in which the character controlled by the player can freely interact in the environment or in the scenario in which he finds himself using single objects, combining them with others, examining particular details of an environment, talking with other characters, solving more or less complex puzzles. There is no single path of game resolution, but an objective goal can be reached through different sequences and game combinations. Typically, these adventures consider the player's moves (positive and negative) and show a score at the end of the game, calculated based on his performance. The particular procedure followed in the resolution can sometimes be evaluated even during the game, leading the engine to generate customized developments of the game that modify the development of the story: in correspondence with certain events, therefore, the adventure forks and proceeds on different paths depending on the outcome of previous tests. The extreme (and most widespread) consequence is achieved in reaching a particular ending, but some games involve reconfiguring alternative paths in the vicinity of the common conclusion. Bringing this dynamic into a

learning path would be a way for students to enhance their creativity, the ability to make decisions, but above all, to enhance their uniqueness: there is not a single or preferred solution to the game, just like there is not one to the problems they face in everyday life and they will meet in the future working life.

- A breakdown of the topics, themes, and skills to be acquired could be structured in blocks (building blocks) inserted not in a sequential and linear path but, defined ex-ante those fundamental bricks (concepts and fundamental skills) to be achieved, we would leave the student the freedom to plan their path and the contents to acquire them. "Do not aim for the path but the goal". A radical paradigm shift considers what students should learn and seeks to enhance what they should become, leaving teachers and students free to plan personalized and adaptive learning experiences that promote diversity and a better approach to learning complexity. This feeds the students' sense of intrinsic motivation rather than the extrinsic reward/punishment motivation for achieving a good grade. Today the world of work is increasingly characterized by complexity, which requires continuous learning by people. No standardised program is the "best technique" for all times and in all contexts. In complex environments, "what works" is the continuous process of learning and adapting.