DELIVERABLE 3.1

Training methodology & Gamification Framework

PROJECT: COASTAL PRO

Game-based Learning of Entrepreneurship and Next-Generation Skills in Coastal Tourism

GA No: 101124745

DURATION (Months): 36

CALL: EMFAF-2023-BlueCareers

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Dissemination level		
PU	PUBLIC	x
PP	Restricted to other PROGRAMME PARTICIPANTS (including the Commission Services)	
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CO	CONFIDENTIAL only for members of the consortium (including the Commission Services)	

Revision History

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V0.1	27/02/2024	First Draft	
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Contributors at this WP are the end user partners. WP1 provides feedback to technical partners.

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Glossary

Abbreviation / Acronym	Meaning
AUTH/SJMC	Aristotle University of Thessaloniki/ School of Journalism and mass media
CINEA	European Climate, Infrastructure and Environment Executive Agency
EC	European Commission
EMFAF	European Maritime and Fisheries Fund
ENAT	European Network for Accessible Tourism
ETIS	European Tourism Indicators System
GA	Grant Agreement
GEJI	Global Environmental Journalism Initiative
IKO	International Kitesurf Organisation
PC	Project Coordinator
PO	Project Officer (EC)
PSB	Project Steering Board
QA	Quality Assurance
UAG	User Advisory Group
UC	Usage Cases
WPL	Work Package Leaders

1 Executive Summary

ACRONYM	**COASTALPRO**
PROPOSAL TITLE	CoastalPro: Game-based Learning of Entrepreneurship and Next-Generation Skills in Coastal Tourism
GA No.	101124745
CALL	EMFAF-2023-BlueCareers / EMFAF-2023-BlueCareers
COORDINATOR	SURF CLUB KEROS IKE
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Coastal tourism stands as a foundational element of the blue economy and plays a pivotal role in shaping the sustainable and environmentally conscious future we aspire to build for Europe. Our project's primary aim is to forge state-of-the-art learning tools, offer high-quality training courses and support, and construct a framework for cultivating next-generation skills in coastal tourism. This initiative seeks to empower individuals with the knowledge and expertise necessary to craft innovative, eco-friendly, and sustainable tourism experiences. By doing so, we aim to rejuvenate overlooked coastal communities, harnessing the natural and cultural maritime heritage as a compelling tourist attraction.

Our overarching vision is to transition away from unsustainable tourism models that contribute to issues such as infrastructure strain, loss of local character, environmental degradation, and overtourism. Instead, we advocate for strategies that generate a substantial number of jobs and business opportunities. Coastal Pro aligns seamlessly with all priority areas, including:

- Creation of innovative educational material: Developing original, content-rich material featuring real case studies and business simulations. Launching an inclusive online program with micro-credentials and certifications.

- Development and piloting of innovative teaching and training approaches: Introducing a gamification framework with a playful experiential approach.

- Establishment and maintenance of structured collaboration frameworks between sectors and education/VET providers: Leveraging the involvement of HOSCO & EURHODIP, our project gains direct access to a community of 1.6 million tourism students and professionals, along with 400 tourism businesses and 200+ educational/VET institutions.

- Pooling and sharing of resources: Offering over 200 educational institutions access to a diverse array of resources, including learning objects, platforms, courses, micro-credentials, training materials, tools, and e-learning solutions through Creative Commons licences. These resources can be adapted and evolved for individual use.

This document aims to present a methodology and gamification framework employing game-based learning techniques, with the objective of enhancing engagement, motivation, and knowledge retention. The framework is designed to establish an immersive virtual environment that not only stimulates users to explore new ideas but also fosters active learning.

Central to this framework is the creation of an experiential conceptual engine, allowing users to tailor their learning journey based on individual needs. The intention is to revolutionise the way employees acquire knowledge, ultimately leading to increased productivity. Additionally, a benchmarking analysis of well-established learning portals (such as Moodle, WordPress, Blackboard, etc.) will guide us in identifying the most suitable platform for our project and is addressed in D3.2.

2 UX requirements identification

2.1 Overview of Methodology

Our methodology is designed to gather essential insights for the identification of technologies and to understand the needs, expectations, and pain points within the scope of the project. The approach involves a concise survey aimed at capturing key information in two main areas:

1. **Educational Requirements for Technology Identification:**

This section of the survey focuses on existing inquiries related to educational requirements. Participants will be prompted to provide feedback on what is currently being asked regarding educational qualifications for technology identification. This insight is crucial for refining our criteria and ensuring alignment with educational standards.

2. **Project Scope: Needs, Expectations, and Pain Points:**

In this segment, respondents will be invited to share their perspectives on the broader project scope. Key areas of exploration include:

- **Needs:** Participants will articulate their specific requirements and necessities within the project context. This information is vital for tailoring our solutions to meet identified needs.

- **Expectations:** Participants will outline their expectations, allowing us to align project deliverables with stakeholder anticipations.

- **Pain Points:** The survey will inquire about challenges or pain points experienced by participants. Understanding these obstacles is crucial for developing targeted strategies to address and mitigate issues.

The methodology is structured to be concise, ensuring participant engagement and facilitating a swift collection of valuable data. The insights gathered through this survey will serve as a foundation for refining our educational requirements, shaping project strategies, and delivering solutions that effectively address identified needs and challenges.

2.2 Stakeholder workshops and focus group

In the scope of designing the platform, a focus group activity was conducted on 08APR2024 in the scope of the intensive week of the Smart EdTech MSc Programme of the Universite Cote d'Azur.

The intensive week invited students of the MSc programme (Instructional Designers and Learning Technologists) from M1 and M2 years. In the scope of the focus group, the partners aimed at identifying the following key questions:

1. What are the needs for delivering hybrid, blended and remote learning activities in the scope of Coastal Pro.
2. What are the affordances of different learning technologies in the scope of facilitating intrinsically motivating learning technologies in the scope of Coastal Pro.
3. What are the most prominent needs of educators and instructional designers in the scope of Coastal Pro.

4. What are the key shortcomings and challenges when it comes to preparing relevant learning experiences using various digital tools?

Additionally, stakeholder workshops took place with consortium partners in order to discuss key challenges and directions for the design of the platform. The combination of the two previous initiatives led to the following conclusions:

- There's a need for engaging content that differentiates itself from mere textual format.
- There's a need for intrinsically motivating learning experiences and the use of playful elements may be a solution to this need.
- There's a need for easy to use and intuitive learning experiences.

2.3 Overview of Users

The e-learning platform is designed for specific user groups, including unemployed youth (COHORT 1 and 2), secondary school and higher education students (COHORT 1), young professionals seeking a career change (COHORT 3), and graduates from vocational education interested in finding inspiration and opportunities in the coastal tourism sector (all COHORTS).

3. Frameworks for intrinsic motivation

3.1 Educational game design

3.1.1 LM-GM

The Learning Mechanics-Game Mechanics (LM-GM) model serves as a theoretical framework primarily employed in the design and analysis of serious games, which deviate from traditional video games by incorporating an educational purpose to enhance the learning process's engagement and interactivity. The LM-GM model endeavours to establish a symbiotic relationship between two crucial components:

1. **Learning Mechanics (LM):** Derived from various educational theories such as constructivism and behaviourism, Learning Mechanics encompass pedagogical components within the game. They dictate learning activities, tasks, and goals, essentially serving as strategies to promote and facilitate learning within the game context.
2. **Game Mechanics (GM):** Constituting the core gameplay elements, Game Mechanics include interactive features, rules, and systems that contribute to the enjoyment and engagement of the game. Examples range from quests and levels to leaderboards, tokens, role-play elements, and badges. Game mechanics drive player interaction, stimulating motivation and engagement throughout the gaming experience.

The LM-GM model posits that knowledge acquisition and skill development should occur organically through gameplay. The seamless integration of educational content into gameplay is pivotal for maximising learning and engagement. By directly connecting Learning Mechanics and Game Mechanics, the game transforms into a dynamic environment conducive to experiential learning.

Notably, the LM-GM model operates descriptively rather than prescriptively, granting designers the flexibility to relate learning and gaming mechanics as needed for a specific serious game. This flexibility is typically exercised through mapping and tabulating the relationships between various learning and game mechanics, allowing for a tailored approach in describing the situation of a particular serious game.

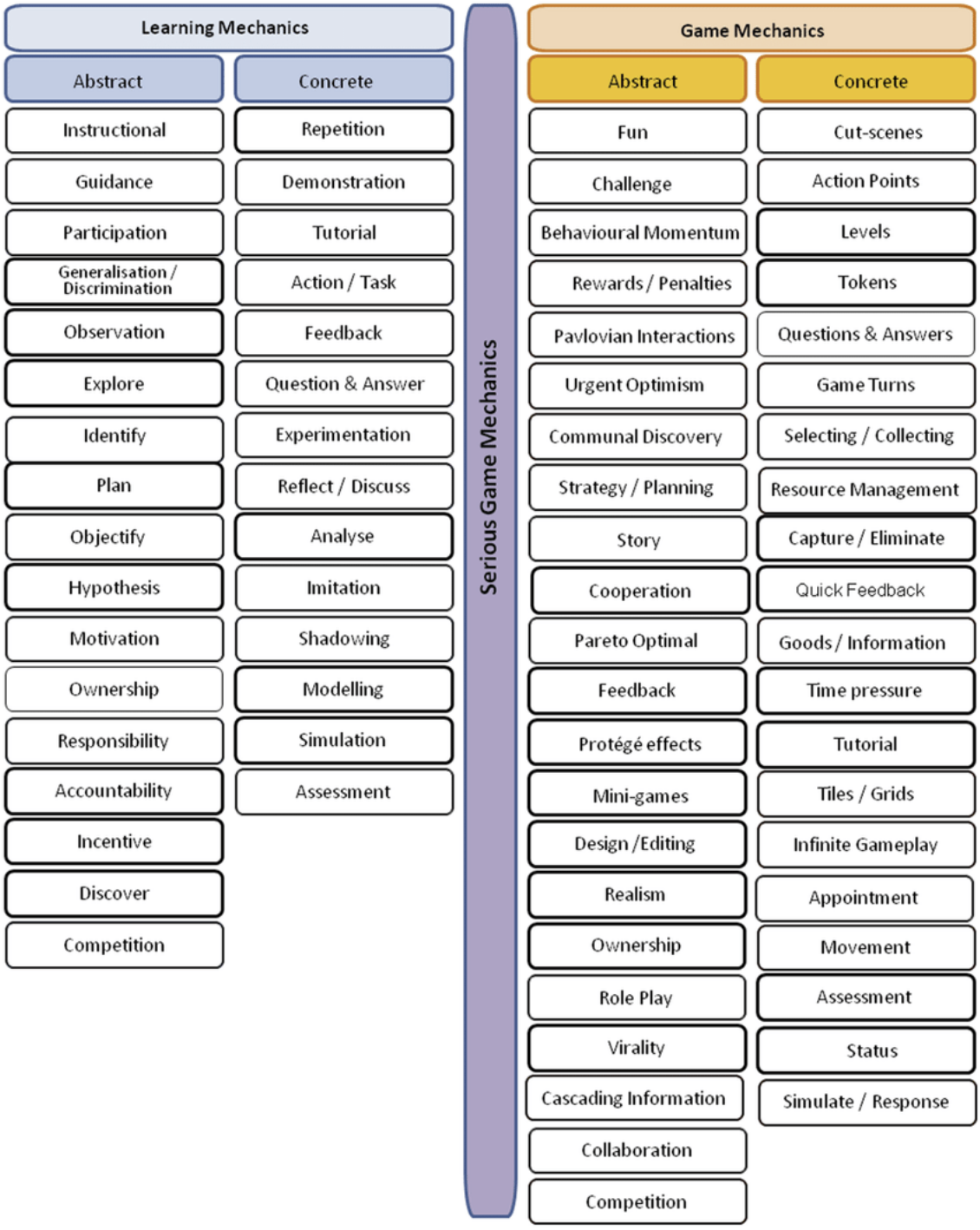


Figure 3.1.1 - The LM-GM framework[1]

Further resources: https://seriousgamessociety.org/wp-content/uploads/2016/09/lmgm_framework.pdf

[1] Arnab, S., Lim, T., Carvalho, M. B., Bellotti, F., De Freitas, S., Louchart, S., ... & De Gloria, A. (2015). Mapping learning and game mechanics for serious games analysis. British Journal of Educational Technology, 46(2), 391-411.

3.1.2 Game Design for Lifelong Learning Playful Experience (GD-LLL-PE) Framework

The GD-LLL-PE, or Game Design for Lifelong Learning Playful Experience Framework is a proposed model for the comprehensive design, integration, and assessment of digital games tailored for lifelong learning objectives. This framework places a strong emphasis on learner-centred design, prioritising a deep understanding of learners' needs, experiences, and contexts throughout the entire process. The GD-LLL-PE framework unfolds in five distinct phases, each with its specific considerations:

1. **Context and Learner Analysis:** In this initial phase, a systematic identification of learner characteristics, including prior knowledge, cognitive styles, personality variables, and aptitude, takes place. This information serves as the foundation for tailoring the game-based learning activity to align with the learner's characteristics, needs, and preferences.

2. **Game Design:** The Game Design phase involves the actual crafting of the educational game. Considerations include defining learning objectives, constructing the game universe with narrative elements, devising game mechanics, and assessing the potential for user-technology interaction.

3. **Pedagogical Integration:** Serving as a pivotal junction, this phase involves the mediation of the game by the teacher through pedagogical activities, granting learners access to the game. It requires thoughtful adaptation and extension of learning objectives, game universe, game mechanics, and user experience to align with specific learning situations.

4. **Play:** The Play phase is where learners engage with the game, encountering its mechanics and design intricacies. This stage encompasses considerations of learning dynamics, gameplay elements including narrative and environment, game dynamics, and the interactive relationship between the learner and the game's technology.

5. **Experience:** The final phase captures the immediate experience of the player interacting with the developed or played game. This stage involves evaluating the learning experience and outcomes, assessing the game universe experience, measuring gameplay enjoyment, and gauging user experience perceptions, considering aspects such as flow, immersion, and engagement.

By adopting the GD-LLL-PE Framework, educators and game designers can effectively enhance the game-based learning experience, ensuring it aligns with the preferences and needs of lifelong learners while promoting effectiveness and engagement.

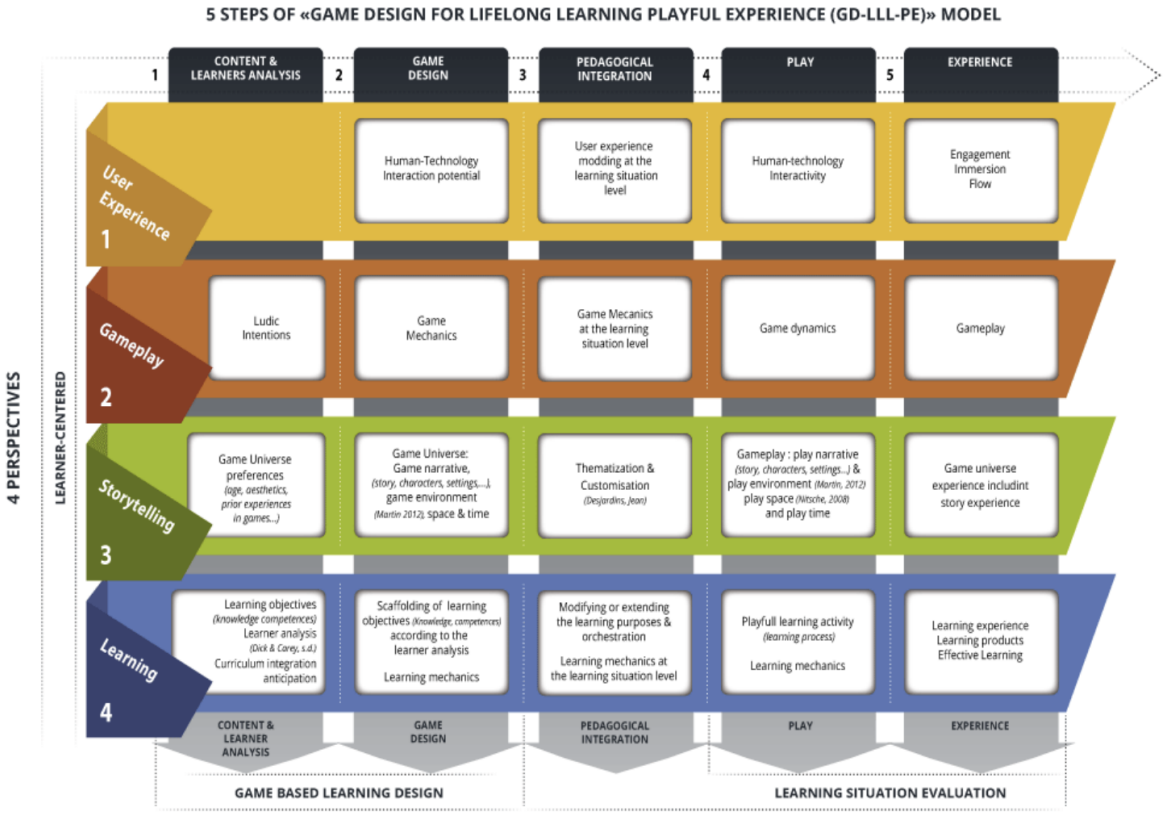


Figure 3.1.2. The GD-LLL-PE model by Romero et al.[2]

Further reading:

https://doi.org/10.1007/978-3-319-41797-4_1

[2] Romero, M., Ouellet, H., & Sawchuk, K. (2017). Expanding the game design play and experience framework for game-based lifelong learning (GD-LLL-PE). Game-based learning across the lifespan: Cross-generational and age-oriented topics, 1-11.

3.1.3 The Elemental pentad

The Elemental Pentad, introduced by Kalmpourtzis[3] as an extension of Jesse Schell's Elemental Tetrad[4], enriches the game design perspective by introducing a fifth element: pedagogy. While the Elemental Tetrad comprises aesthetics, story, mechanics, and technology as the foundational elements of game design, the Elemental Pentad extends this framework by placing pedagogy—the method and practice of teaching—at its core. This addition underscores the concept that educational games must strike a balance between traditional game design components and the imperative for effective learning. By incorporating pedagogy as a central consideration, the Elemental Pentad emphasises the crucial role that educational intent plays in shaping the design and development of games, recognizing the need for a harmonious integration of learning methodologies within the gaming experience.

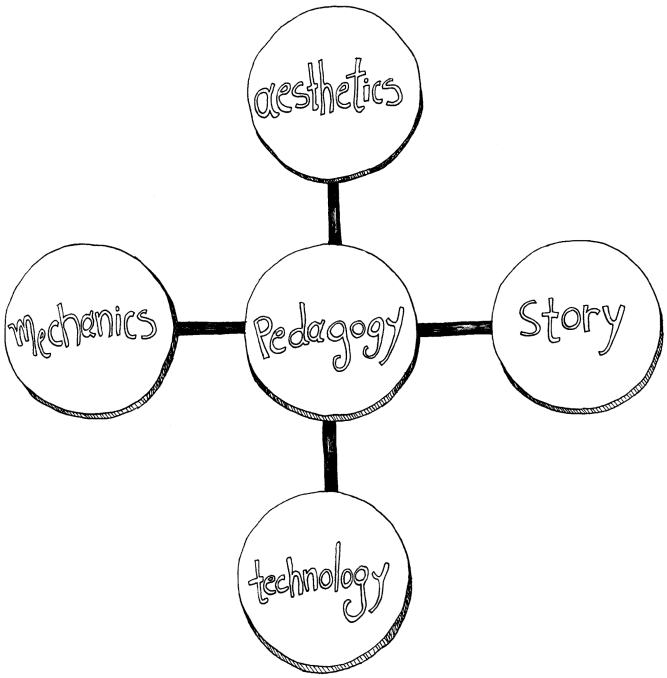


Figure 3.1.3 The Elemental Pentad

The influence of the pedagogy element in game design can vary significantly based on the designers' approach, methodologies, and comprehension of the learning context and target audience. Its impact can range from minor, as seen in games with a surface-level layer of learning, to major, where it profoundly influences all other elements of the game.

Games, whether initially designed for educational purposes or not, can serve diverse roles within learning environments. They can function as introductions to learning topics, tools for exploration, or facilitators for work and assessment. From the perspective of the Elemental Pentad, the pedagogy element can exert its influence across any game. Whether an educator chooses to develop a new educational game from the ground up or modify and integrate a Commercial Off-The-Shelf (COTS) game to meet specific teaching goals, the impact of pedagogy can vary based on the educator's involvement in the game design process.

[3] Kalmpourtzis, G. (2018). Educational Game Design Fundamentals: A journey to creating intrinsically motivating learning experiences. CRC Press.

[4] Schell, J. (2008). The Art of Game Design: A book of lenses. CRC press.

This analysis leads to the proposal of a "funnel of pedagogic impact" (Figure 3.2.3.4). The funnel visually represents the insights gained regarding the impact of the pedagogy element on the design and utilisation of educational games. The interconnection and mutual impact between pedagogy and game elements are strongest when both are considered from the outset of the design process. In cases where either pedagogy or game elements are pre-defined at the start of the process, designers must devise solutions that align with those prerequisites, resulting in a smaller impact among these elements. For instance, designing educational games using a specific technical platform or adhering to a predefined approach and learning objectives set by a client or curriculum. The use of COTS provides additional adaptability for aligning learning objectives with specific course delivery requirements. Ultimately, the sooner a game designer engages in the educational game design process, the more significant the interconnection among all elements of the Elemental Pentad, fostering a more integrated relationship between learning and gaming aspects.

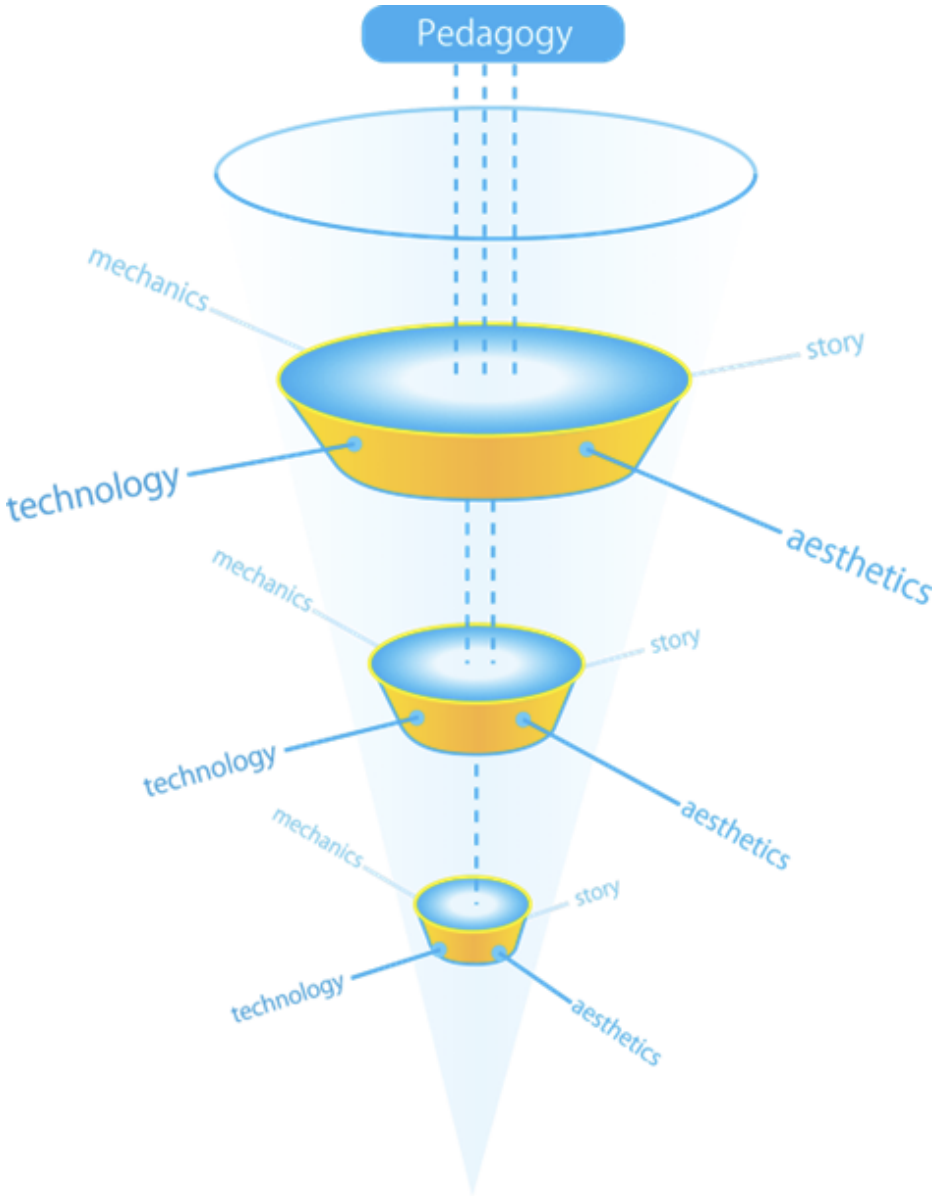


Figure 3.1.4 The impact of the Elemental Pental on different game design phases

3.2 Designing learning experiences in the scope of COASTALPRO

Figure 3.2.1 Designing learning experiences

Crafting effective learning experiences is a complex endeavour, demanding a blend of diverse skills from various disciplines. To facilitate this intricate and iterative process, CostalPRO introduces a canvas comprising a series of pivotal questions. These questions aim to guide stakeholders in aligning their perspectives and efforts towards the optimal design of learning experiences.

The key inquiries encompass:

- **Target audience**
  - Identification of the learners targeted by the envisioned interventions.
  - Assessment of their learning outcome needs.
  - Exploration of expectations for participation and engagement in proposed learning activities.
  - Evaluation of their existing skills, competencies, and knowledge before the learning interventions.
  - Definition of the expected knowledge level post-interventions.
- **Business needs**
  - Recognition of the organisation's business objectives, particularly in for-profit settings.
  - Establishment of measurable objectives, including Key Performance Indicators (KPIs).
- **Content inventory**
  - Assessment of existing learning content availability
  - Relevance for the targeted contexts.
- **Learning objectives**
  - Definition of precise learning objectives for the proposed learning experiences.
- **Design challenge**
  - Synthesis of all discussions into the optimal approach for addressing the learning needs of the target audience, meeting organisational business objectives, and fulfilling defined learning objectives.

This comprehensive canvas serves as a versatile tool compatible with the various processes and approaches outlined and analysed throughout this guide, offering a structured framework to navigate the complexities of designing impactful learning experiences.

4 Design process

In this chapter, an in-depth exploration of secondary research is undertaken to delve into the realms of **Human-Centred Design** and **Learning Experience Design**. The focus is on discerning critical elements within design processes, learning models, and the design of engaging experiences. The ultimate objective is to put forth a design approach tailored to the specific context of utilising XR technologies in the realm of education and training. The analytical process culminates in the introduction of the **XR Learning Experience Design Canvas**—a tool crafted to effectively steer and assist stakeholders throughout the varied stages of formulating XR-based learning experiences.

4.1 Human Centred Design

Interacting with technology isn't always seamless; there are instances where it can be downright frustrating. Consider attempting to navigate a public service website with unclear information, struggling with a parking ticket machine, or grappling with a complex oven control panel. These scenarios exemplify instances of poor design. But is bad design intentional? In most cases, no. The primary reason behind it often lies in the creators' lack of understanding of how users think and operate.

In today's rapidly evolving technological landscape, people are inundated with information and tasks. Consequently, users often resort to "muddling through"[5] technology rather than mastering it. This entails diving into a new platform without reading a manual or undergoing training, relying on trial and error to accomplish tasks.

Efficient design, however, centres on the end-users rather than the products themselves, and this principle underpins Human-Centred Design (HCD). According to ISO 941-210:2010[6], HCD is an interactive systems development approach that prioritises making systems usable and useful by focusing on users, their needs, and requirements. It incorporates human factors/ergonomics, usability knowledge, and techniques to enhance effectiveness, efficiency, well-being, user satisfaction, accessibility, sustainability, and mitigate potential adverse effects on health, safety, and performance.

In HCD, humans are placed at the core of the design process. The initial step involves comprehending users—understanding their expectations, needs, and pain points. Design then emerges as a tailored solution to address these user needs and challenges. Observing how users work, rather than relying solely on their input, is a key aspect of user-centred design. Users may not always be aware of their needs and difficulties, prompting continuous testing and iteration of design ideas to optimise solutions.

This section will delve into various tools aimed at understanding users, proposing solutions, and testing them iteratively with users to align designs more closely with their needs.

Resources for further reading

https://www.usability.gov/what-and-why/user-centered-design.html/

http://www.designkit.org//resources/1/

[5] Krug, S. (2000). Don't make me think!: a common sense approach to Web usability. Pearson Education India.

[6] Kett, S. G., & Wartzack, S. (2015). Integration of Universal Design principles into early phases of product design-a case study. In DS 80-9 Proceedings of the 20th International Conference on Engineering Design (ICED 15) Vol 9: User-Centred Design, Design of Socio-Technical systems, Milan, Italy, 27-30.07. 15 (pp. 289-300).

https://www.w3.org/WAI/redesign/ucd/
https://www.wired.com/insights/2013/12/human-centered-design-matters/
https://www.unicef.org/innovation/hcd/

4.2 Iterative design processes

4.2.1 Design thinking

Human-Centred Design has evolved in tandem with technological advancements. As technology matures and becomes more ingrained in human lives, the demand for user-friendly interfaces that effectively cater to human needs is on the rise.

When creating new experiences, there are various methods to apply Human-Centred Design, and one of the most widely recognized approaches is Design Thinking. Coined by IDEO's Tim Brown and David Kelley, along with Roger Martin, Design Thinking is described by Tim Brown as "a human-centred approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success."

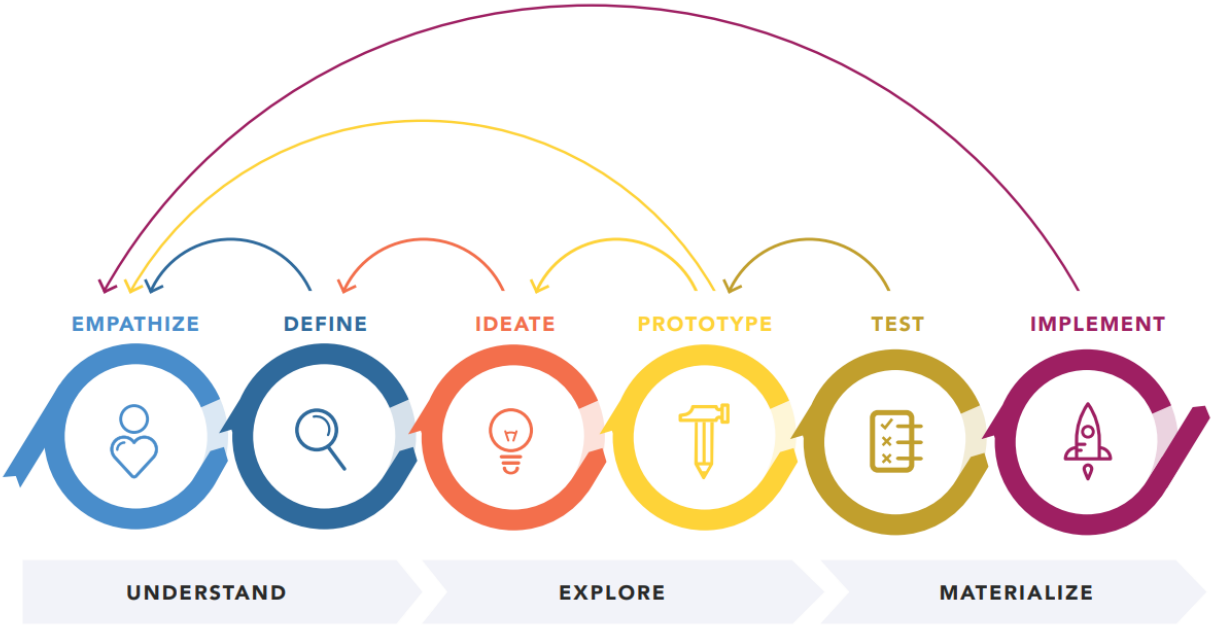


Figure 3.2.1.1 - The Design Thinking process by the NN Group

Design Thinking is a design approach accompanied by a prescribed process consisting of three distinct phases—Understand, Explore, and Materialise—and six steps within these phases:

Understand

- **Empathise:** Seek to comprehend users' actions, thoughts, feelings, and identify their problems.
- **Define:** Synthesise research, incorporating insights about users, business objectives, and learning goals. This phase highlights user problems and opportunities for innovative solutions.

Explore

- **Ideate:** Engage in brainstorming to generate a multitude of ideas, ranging from ambitious to far-fetched. The goal is to encourage a broad spectrum of creative possibilities.

- **Prototype:** Group and select ideas, transforming interesting and feasible concepts into concrete forms through prototyping.

Materialize

- **Test:** Present prototyped ideas to users for feedback. This phase prioritises observing user interactions rather than relying solely on self-reported experiences, recognizing that user actions may reveal insights not expressed verbally.
- **Implement:** Combine all previous work to produce the final product.

Design Thinking is not a linear process but fosters iterative work. The need to revisit and iterate on phases such as empathising, defining, ideating, prototyping, or testing depends on project size, team dynamics, and ultimate objectives. An essential takeaway from Design Thinking is that creating impactful products and experiences requires time and a focus on designing the right solution, not just designing something technically sound.

Crucially, Design Thinking emphasises understanding users and their needs before proposing solutions. A visually appealing interface may prove futile if it doesn't address user problems. The approach recognizes that taking the time to understand users, identify their needs, and devise solutions is crucial for creating meaningful and impactful experiences. In the realm of Design Thinking, proposing ideas, whether good or bad, is viewed as a strength rather than a weakness. This open approach to ideation encourages the generation of innovative ideas, often considered unconventional initially but crucial for driving innovation. Through multiple iterations, testing, and user feedback, these ideas can be refined and lead to compelling and user-centric outcomes.

Resources for Further Reading

https://designthinking.ideo.com/

https://dschool.stanford.edu/resources-collections/a-virtual-crash-course-in-design-thinking/

4.2.2 Double diamond

In 2004, the Design Council introduced an innovation framework known as the Double Diamond[7], designed to tackle intricate design challenges. The framework is visually represented by two diamonds, each serving as a structured guide for the design process. Within each diamond, there are phases for both divergent thinking, where designers delve deeply into issues from various perspectives, and convergent thinking, where concrete and focused actions are taken to address the identified challenges.

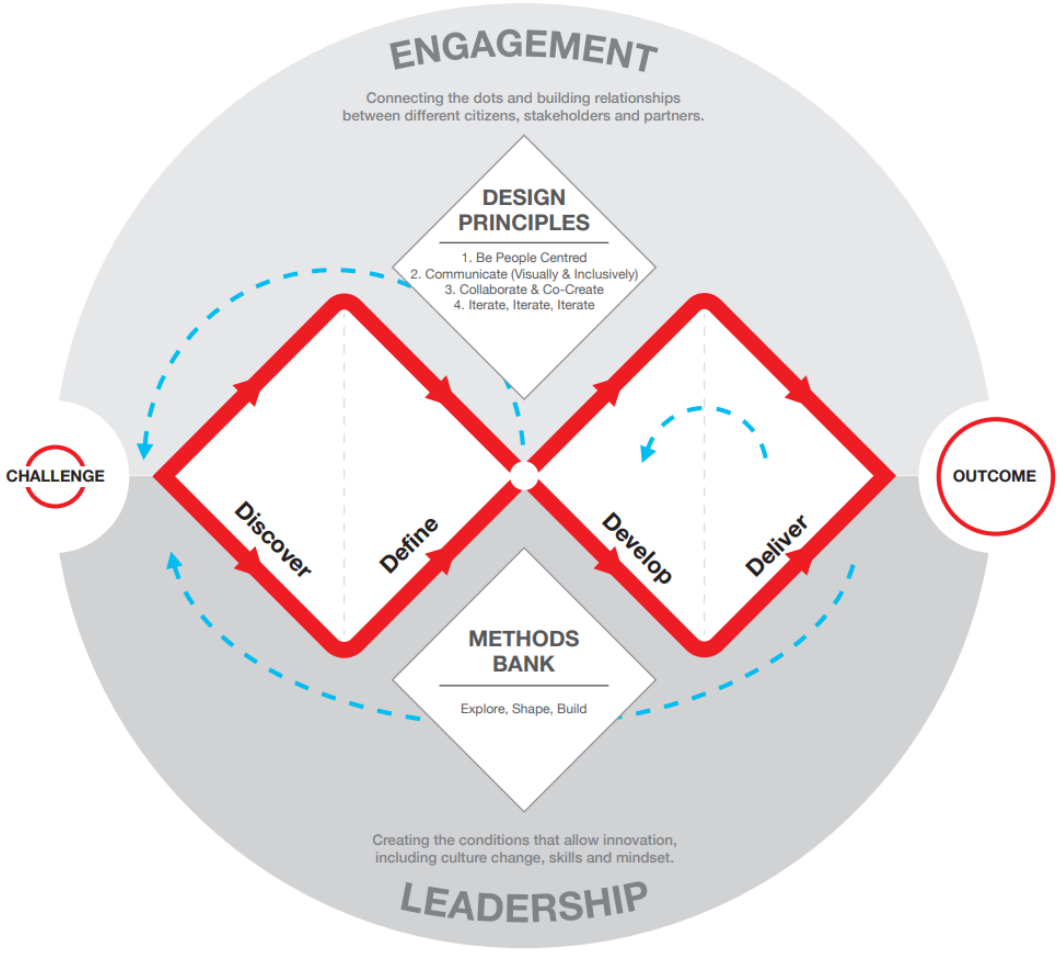


Figure 3.2.2.1 - The Double Diamond framework as described by the Design Council

The Double Diamond model outlines four distinct phases:

- **Discover:** In this initial phase, both designers and non-designers invest time in gaining a comprehensive understanding of the challenges they aim to address. Information is gathered from various sources, including insights into the organisation, its customers, users, competition, or any other crucial factors that will inform the subsequent generation of solutions.

[7] Moon, H. C., Rugman, A. M., & Verbeke, A. (1998). A generalized double diamond approach to the global competitiveness of Korea and Singapore. International business review, 7(2), 135-150.

- **Define:** The accumulation of diverse information from different sources leads to the crystallisation of identified problems. This phase involves synthesising the gathered data to precisely articulate the issues that design teams need to confront.

- **Develop:** Building on the defined problems, multidisciplinary teams—comprising both designers and non-designers—collaborate to seek inspiration, engage in collective or individual brainstorming, and co-create solutions in a participatory manner. This phase fosters the development of a range of potential solutions.

- **Deliver:** With a myriad of solutions generated during the Develop phase, the Deliver phase focuses on testing these proposed solutions. Rigorous testing and evaluation ensue, leading to the rejection of solutions that prove ineffective while refining and improving those that demonstrate promise.

References

https://designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond

4.2.3 Design rectangle

The Design Rectangle is a creative problem solving process that identifies **Four Fundamental Phases**:

- A problem is found and understood
- Strategies to solve the problem are proposed, materialising into solutions
- Solutions are applied and explored
- The solutions as well as the process of coming up with them are assessed

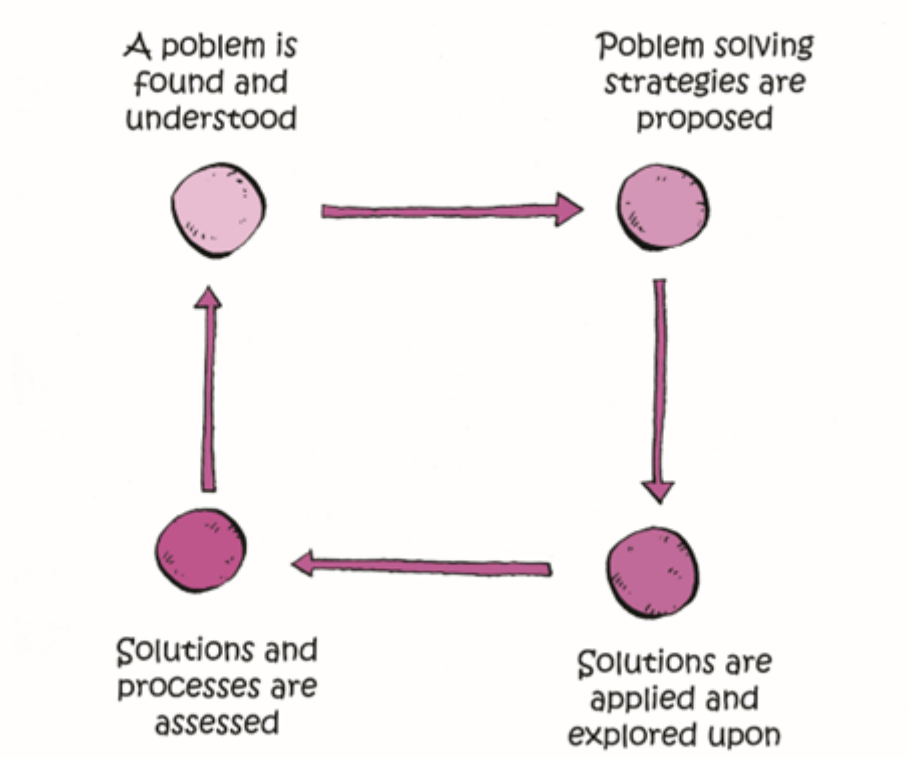


Figure 3.2.3.1 - The Design Rectangle, as identified by Kalmpourtzis[8] in Don't Force it, Solve it!

[8] Kalmpourtzis, G. (2022). Don't Force It, Solve It!: How To Design Meaningful and Efficient Design Processes. CRC Press.

4.3 Learning experience design

4.3.1 ADDIE

ADDIE[9], a systematic instructional design model, comprises five interconnected phases: Analysis, Design, Development, Implementation, and Evaluation. Recognized for its iterative and flexible nature, ADDIE revolves around addressing the specific needs of learners, making it widely applicable across various instructional contexts. This model provides a dynamic and adaptable framework for crafting effective training and performance support tools.

Breaking down each phase:

1. Analysis: This initial phase involves a comprehensive examination of the instructional problem, establishing goals and objectives, and identifying the learning environment along with the learner's existing knowledge and skills. The outcome of the analysis phase is a clear definition of the intended audience, learning objectives, and the learning environment, laying the groundwork for subsequent phases.

2. Design: Leveraging the insights gained during the analysis, the design phase focuses on planning the learning solution. Detailed storyboards and prototypes are created, instructional strategies are designed, and media choices are made. Outputs from this phase include lesson plans, visual design drafts, and storyboards.

3. Development: This phase sees the actual creation of content based on decisions and plans outlined in the design phase. Storyboards are translated into tangible course materials, which are then produced, validated, and tested. It is the stage where the envisioned instructional materials come to life.

4. Implementation: Once the course materials are developed, they are delivered or distributed to students. Preparations for facilitators, including any required training or orientation, are made. The course is conducted, and materials are distributed to the group. Feedback from learners and facilitators helps identify immediate issues or challenges.

5. Evaluation: The evaluation phase comprises formative and summative evaluations. Formative evaluation is embedded throughout each stage of the ADDIE process, while summative evaluation is conducted at the course's conclusion, assessing overall effectiveness. Based on feedback and outcomes, the instructional design may loop back to any previous stage for modification and improvement, emphasising continuous refinement.

4.3.2 SAM

The Successive Approximation Model (SAM) serves as an agile development model created by Michael Allen[10] to enhance the efficiency and responsiveness of instructional design product creation, presenting an alternative to the traditional ADDIE model. SAM comprises three primary phases: Preparation, Iterative

[9] Branch, R. M. (2009). Instructional design: The ADDIE approach (Vol. 722). New York: Springer.

[10] Allen, M. W., & Sites, R. (2012). Leaving ADDIE for SAM: An agile model for developing the best learning experiences. American Society for Training and Development.

Design, and Iterative Development. This model's hallmark is its commitment to continuous refinement and feedback, fostering flexibility and adaptability. Let's delve into each phase:

1. Preparation Phase: In this initial phase, information is gathered concerning learners, the instructional problem, and project goals, akin to the ADDIE Analysis phase. Additionally, the 'Savvy Start' meeting is incorporated, where stakeholders brainstorm, sketch, and prototype instructional design concepts. This sets the stage for the design and development process, producing project goals and initial design prototypes.

2. Iterative Design Phase: The Iterative Design phase refines the initial design prototypes from the Preparation phase into more concrete versions. Through an iterative process, these prototypes undergo reviews and revisions based on feedback from stakeholders and subject-matter experts. The objective is to solidify the instructional design for further development. The outcome of this phase is agreed-upon design proofs that provide guidance for the subsequent development process.

3. Iterative Development Phase: Contrary to ADDIE, SAM's development phase incorporates not only the creation of instructional materials but also their implementation and evaluation. Instructional materials are developed, implemented, and evaluated for effectiveness. Based on the evaluation, ongoing refinements are made until the instructional materials achieve the desired level of effectiveness. This iterative loop of development, implementation, and evaluation continues.

SAM’s key strength lies in its iterative nature, allowing for continuous improvement throughout the development process. It promotes active engagement from stakeholders early on, fostering the creation of more effective and tailored instructional materials. However, the choice between SAM and other models, such as ADDIE, depends on factors such as project nature, the skills and preferences of the design team, and the project's timeline and resources.

5. Aims of the exercise and thematic modules

5.1 The training content will cover 6 thematic modules

The targeted learners are grouped into four cohorts (1,2,3,4) and divided into two levels, beginners (1,2) and advanced (3,4)

Four cohorts of different target groups

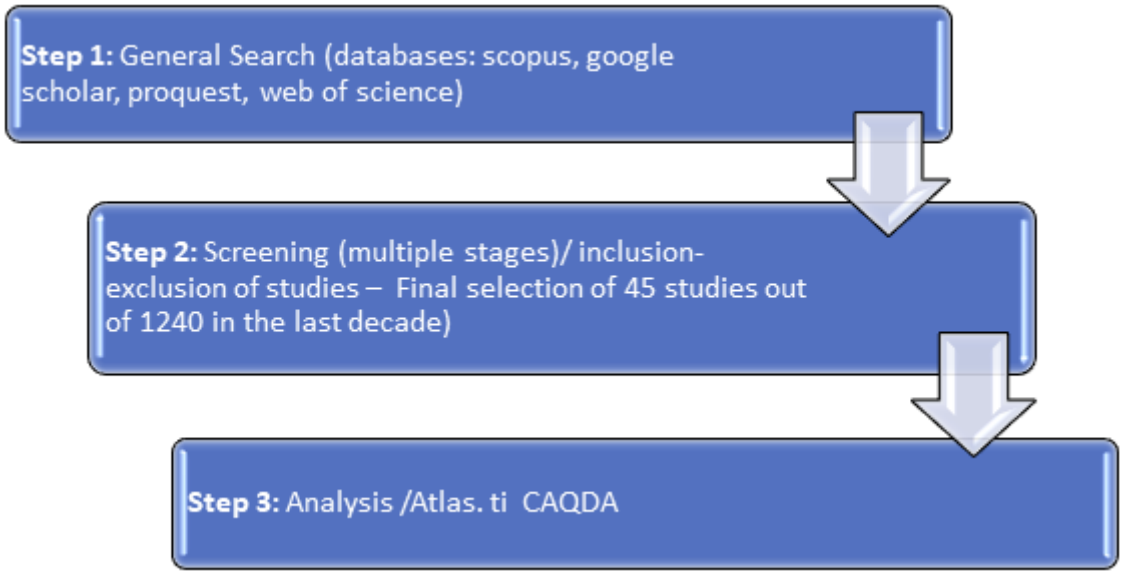
1. Skilling the new generation
2. Upskilling young graduates
3. Reskilling professionals/entrepreneurs
4. Inspiring young entrepreneurs

According to the project proposal, **a game-based learning strategy** will be employed to engage the targeted learners in a collaborative self-paced online learning environment. To design the most effective training methodology, a literature review of theoretical and empirical studies on gamification and game-based learning was conducted during October 2023-January 2024.

5.2 Research Questions of the study

1. What are the most used gamification elements in online learning environments?
2. What factors do we need to consider when designing game-based online training content?
3. Which gamification elements increase learners' motivation and engage them in e-learning?

5.3 Study Methodology



5.4 Results of the study

RQ1: What are the most used gamification elements in online learning environments?

- Badges
- Leaderboards
- Points
- Feedback
- Challenges, missions, goal indicators, competitions
- Likes, social features
- Channels for communication (chats/social networks)
- Stories/narratives/storytelling
- Levels
- Progress bars
- Teams
- Avatars
- Medals, awards, gifts, trophies, virtual currencies
- Time limit
- Possibility to re-do a task or module (replayability)

RQ2: What factors do we need to consider when designing game-based online training content?

- Motivation
- Performance
- Engagement

RQ3: Which gamification elements increase learners' motivation and engage them in e-learning?

- Badges
- Leaderboards
- Points
- Feedback
- Challenges, missions, goal indicators, competitions

- Likes, social features
- Channels for communication (chats/social networks)
- Stories/narratives/storytelling
- Levels
- Progress bars
- Teams
- Avatars
- Medals, rewards, gifts, trophies, virtual currencies
- Time limit
- Possibility to re-do a task or module (replayability)

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