Learn to Play for the Future

METHODOLOGY PLAN FOR WP 4

LEARN TO PLAY PROJECT

2024-1-SK01-KA220-HED-000252451 LEARN TO PLAY FOR THE FUTURE

Co-funded by the European Union

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The Learn2Play4Future project is dedicated to assessing the influence and efficacy of game-based learning (GBL) and gamification across various educational settings. The project aspires to:

- boost students' engagement, motivation, and creativity by weaving educational games and gamification techniques into learning experiences.
- strengthen teacher training by embedding digital games into the curriculum, equipping future educators with the skills to effectively implement GBL in their classrooms.
- generate research exploring the long-term impact of GBL on students' academic achievement and skill progression.
- create the Edu Game Maker Toolbox, a practical resource designed to help educators develop and apply educational games.

WP 4 – AIMS, OBJECTIVES AND DELIVERABLES

- **R4.1.**: A comprehensive methodological plan for the implementation of the research activities in the project with clear objectives, research aims, timeline, division of tasks, milestones. It will be published online and free to use.
- **R4.2.**: Baseline comparative report presenting international best practices in implementing university courses focused on game-based learning and educational games development. This report will be a key resource for the project partners in process of designing new courses brought by this project in WP2 and implemented under WP3
- **R4.3.**: Needs analysis among educators and students at each of the participating universities. Results of this analysis will also be a key resource for project partners in designing the syllabi of the courses created and implemented in WPs 2 and 3.
- **R4.4.**: Course effectiveness data reports which will highlight the satisfaction for students with the implemented courses in their different implementation stages throughout the project. Analysis of these data sets will enable project partners to improve the courses in between pilot, main and sustainability stage.
- **R4.5.**: UX data analysis report, which will inform the production of Edu Game Maker Toolbox in WP5.
- **R4.6.**: An extensive research study (broken down to a number of published academic articles) showcasing the impact of educational games on student motivation, learning outcomes, inclusive engagement, and skill development compared with traditional learning methods among students especially in school education.

EXPECTED NUMBER AND PROFILE OF PARTICIPANTS

50 external universities, individual experts reached by the published research

9 partner university staff members

250 students participating in either focus groups, questionnaire data gathering or courses themselves,

Research Timeframe

01.09.2024 – 30.11.2024: WP 4 PLAN DEVELOPMENT

AIM: To create a plan with a timeframe aligned with the project outcomes concerning the research package (WP4)

TASKS:

- Draft a document with guidelines for project activities
- Create a timeline for data collection across different stages of course implementation.
- Propose methods (with research questions and tools for measuring engagement and learning outcomes e.g., questionnaires, and analytical categories for game use).

OUTCOME: Comprehensive research plan regarding research aims, objectives and prospective outcomes.

DEADLINES:

TASKS		DATES	Who's responsible
1.	First draft of the document	01.09.2024 -**15.10.2024**	UBB
2.	Feedback from partners	16.10.2024 - **15.11.2024**	ALL PARTNERS
3.	Document refinement	16.11.2024 - **29.11.2024**	UBB
4.	Document publication	**30.11.2024**	UBB & UCM

01.12.2024 – 28.02.2025: BASELINE ANALYSIS

AIM: To conduct a baseline analysis in the project partners' countries to establish the status quo in game-based learning and gamified learning experiences together with educational games' creation in the context of higher education.

TASKS:

- Analyze current practices in the Game-Based Learning approach (GBL), gamification technique (GT), and educational games; development programmes (EGD) in higher education institutions;
- Analyze documents on game-based learning effectivity;
- Analyze institutional documents (e.g. study programs, subject syllabi Meaning syllabi of the study programmes at UNIs which have GBL courses and policies related to GBL, GT and EGD;

OUTCOME: Preparing a baseline comparative report presenting best practices in implementing university courses focused on game-based learning and educational games development in the partner countries.

DEADLINES:

TASKS		DATES	Who's responsible
1.	Preparing a detailed plan for the baseline analysis with instruments to be used and reporting chart to be employed by the partners	01.12.2024 - **15.12.2024**	UBB
2.	Gathering data	15.12.2024 - **30.01.2025**	ALL PARTNERS
3.	Analyzing the gathered data and preparing the comparative report	01.02.2025 - **20.02.2025**	ALL PARTNERS & UBB
4.	Document publication	**28.02.2025**	UBB & UCM

Additional documents regarding this stage:

1. Baseline analysis detailed plan

Research Timeframe

01.09.2025-31. 01.2026 - COURSE I – PILOT STAGE

AIM: To gauge students' perception of GBL, GT & EDG; to assess their motivation level in relation to the possibility of applying GBL, GT & EDG.

TASKS:

- Administer pre- and post-tests (120 questionnaires) to evaluate students' perceptions of Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Digital Games (EDG) development, as well as their motivation and other affective components (e.g., anxiety levels, engagement, or attitude). These tests will be conducted before and after the course to measure changes and assess the impact of these methodologies on student attitudes and emotional responses.
- To conduct observation logs and reflective diaries documenting the classroom experience for students, practical challenges, and strategies for overcoming them in relation to conducting courses on GBL, GT and EDG (for teachers).
- UX research: https://docs.google.com/document/d/1A6gPDdfLnU15lc6iQFDlUldsRPI6vsoJgza6yGcLTy8/edit?tab=t.0

OUTCOME: Report presenting the results of qualitative and quantitative analyses

DEADLINES:

TASKS		DATES	Who's responsible
1.	Preparing a detailed plan for the pilot stage research together with the instruments to be used	01.04.2025-30.06.2025	UBB
2.	Gathering data	01.09.2025 - 31.01.2026	ALL PARTNERS
3.	Coding the data for the analysis	01.02.2026 - 28.02.2026	ALL PARTNERS
4.	Analysing the gathered data	01.03.2026 - 30.04.2026	ALL PARTNERS
5.	Preparing the report regarding qualitative and quantitative analyses	01.05.2026 - 30.05.2026	UBB
6.	Document publication	31.05.2026	UBB
7.	Syllabi refinement phase	01.06.2026 - 31.07.2026	ALL PARTNERS

Additional documents regarding this stage:

1. Research for the pilot phase- a detailed plan
2. UX methodology document

1.02.2026 – 28.02.2026: FIRST COLLOQUIUM & FOCUS GROUP SESSIONS

AIM: To gather students, teachers and experts' perceptions on the effectiveness of GBT and EGD courses and to review the impact of the game-based learning syllabus after its initial implementation.

Research Timeframe

TASKS:

- Organize and conduct the colloquium to present preliminary results of the consortium's work
- Gather feedback and insights from participants regarding their experiences with the syllabi and the courses through focus groups to refine the syllabi
- Discuss potential challenges and strategies for syllabus development (to provide supplementary knowledge to the data gathered in the pilot phase)

OUTCOME: Feedback report to be used in the syllabi refinement stage

DEADLINES:

TASKS		DATES	Who's responsible
1.	Preparing the colloquium & focus groups with instruments	01.01.2026 - 31.01.2026	CUBA & UBB
2.	Conducting the colloquium & focus groups together with data collection	01.02.2026 - 15.02.2026	CUBA & ALL PARTNERS
3.	Coding the data for the analysis	16.02.2026 - 28.02.2026	ALL PARTNERS
4.	Analysing the gathered data	01.03.2026 - 30.04.2026	ALL PARTNERS
5.	Preparing the report regarding qualitative and quantitative analyses	01.05.2026 - 30.05.2026	UBB
6.	Document publication	31.05.2026	UBB & UCM
7.	Syllabi refinement phase	01.06.2026 - 31.07.2026	ALL PARTNERS

Additional documents regarding this stage:

1. Colloquium & Focus Groups preparation plan

01.09.2026 - 30.01.2027 - COURSE II - MAIN STAGE

AIM: To gauge students' perception of GBL, GT & EDG; to assess their motivation level in relation to the possibility of applying GBL, GT & EDG in the main stage.

TASKS:

- Administer pre- and post-tests (120 questionnaires) to evaluate students' perceptions of Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Digital Games (EDG) development, as well as their motivation and other affective components (e.g., anxiety levels, engagement, or attitude). These tests will be conducted before and after the course to measure changes and assess the impact of these methodologies on student attitudes and emotional responses during the main stage of the research.
- To conduct observation logs and reflective diaries documenting the classroom experience for students, practical challenges, and strategies for overcoming them in relation to conducting courses on GBL, GT and EDG (for teachers).

OUTCOME: Report presenting the results of qualitative and quantitative analyses

Research Timeframe

TASKS		DATES	Who's responsible
1.	Preparing a detailed plan for the main stage research together with the instruments to be used	01.04.2026-30.06.2026	UBB
2.	Gathering data	01.09.2026 - 31.01.2027	ALL PARTNERS
3.	Coding the data for the analysis	01.02.2027 - 28.02.2027	ALL PARTNERS
4.	Analysing the gathered data	01.03.2027 - 30.04.2027	UBB
5.	Preparing the report regarding qualitative and quantitative analyses	01.05.2027 - 30.05.2027	UBB
6.	Document publication	31.05.2027	UBB & UCM
7.	Syllabi refinement phase	01.06.2027 - 31.07.2027	ALL PARTNERS

Additional documents regarding this stage:

1. Research for the main phase- a detailed plan

01.02.2027 – 28.02.2027: SECOND COLLOQUIUM & FOCUS GROUPS

AIM: To gather students, teachers and experts' perceptions on the effectiveness of GBT and EGD courses and to review the impact of the game-based learning syllabus after its initial implementation.

TASKS:

- Organize and conduct the second colloquium to present research progress and the consortium's work
- Gather feedback and insights from participants regarding their experiences with the syllabi and the courses through focus groups to refine the syllabi
- Discuss potential challenges and strategies for syllabus development (to provide supplementary knowledge to the data gathered in the pilot phase)

OUTCOME: Feedback report used in the syllabi refinement stage after the main stage

DEADLINES:

TASKS		DATES	Who's responsible
1.	Preparing the colloquium & focus groups with instruments	01.01.2027 - **31.01.2027**	UBB
2.	Conducting the colloquium & focus groups together with data collection	01.02.2027 - **15.02.2027**	UBB & ALL PARTNERS
3	Coding the data for the analysis	16.02.2027 - **28.02.2027**	ALL PARTNERS
4.	Analysing the gathered data	01.03.2027 - **15.03.2027**	UBB
5.	Preparing the report regarding qualitative and quantitative analyses	16.03.2027 - **30.03.2027**	UBB
6.	Document publication	**31.03.2027**	UBB & UCM
7.	Syllabi refinement phase	01.04.2026 - **30.04.2027**	ALL PARTNERS

Research Timeframe

01.05.2027 - 31.07.2027 - COURSE III – SUSTAINABILITY PHASE

AIM: To gauge students' perception of GBL, GT & EDG; to assess their motivation level in relation to the possibility of applying GBL, GT & EDG.

TASKS:

- Administer pre- and post-tests (120 questionnaires) to evaluate students' perceptions of Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Digital Games (EDG) development, as well as their motivation and other affective components (e.g., anxiety levels, engagement, or attitude). These tests will be conducted before and after the course to measure changes and assess the impact of these methodologies on student attitudes and emotional responses during the main stage of the research.
- To conduct observation logs and reflective diaries documenting the classroom experience for students, practical challenges, and strategies for overcoming them in relation to conducting courses on GBL, GT and EDG (for teachers).
- To conduct a detailed analysis on the usability of the courses.

OUTCOME: Report presenting the results of qualitative and quantitative analyses

DEADLINES:

TASKS		DATES	Who's responsible
1.	Preparing a detailed plan for the sustainability stage research together with the instruments to be used	01.05.2027-**15.05.2027**	UBB
2.	Gathering data – 3rd cycle – Summer school course	16.05.2027 - **15.06.2027**	ALL PARTNERS
3.	Coding the data for the analysis	16.06.2027 - **30.06.2027**	ALL PARTNERS
4.	Analysing the gathered data	01.07.2027 - **15.07.2027**	UBB
5.	Preparing the final report	16.07.2027 - **31.07.2027**	UBB
6.	Document publication	**01.08.2027**	UBB & UCM

Additional documents regarding this stage:

1. Research for the sustainability phase- a detailed plan

Effectiveness and Impact of Games in Diverse Learning Environments

1. Introduction

A baseline analysis provides a data-driven understanding of the current state of a specific domain or subject before implementing interventions or changes (Chen, 2005; Rossi et al., 2004). It establishes a reference point, identifies gaps and opportunities, and serves as a benchmark for evaluating the effectiveness of subsequent interventions. Additionally, it supports evidence-based decision-making by providing foundational insights into existing practices and challenges.

In the context of the Learn2Play4Future project, the baseline analysis will assess:

- the current implementation of Game-Based Learning (GBL) courses,
- Game-Based Teaching and Gamification methodologies' implementation in higher education institutions and their perceived effectiveness;
- Educational Games Development (EGD) programs in higher education institutions
- game design books (textbooks);
- papers assessing design, impact and effectiveness of educational games;
- cards, software or other tools which are used for designing games (we have the Game Design cards, UNITY, Minecraft);

This analysis will also include the review of institutional documents (e.g., study programs, subject syllabi). The findings will form the foundation for designing future project activities, such as the needs analysis and ultimately the syllabi to be used in GBL and EGD courses.

2. Aims and Objectives

Aims: To assess the status quo of GBL, GT, and EGD implementation and effectiveness in higher education institutions to guide the design and evaluation of subsequent project activities.

Objectives:

1. Analyze current practices in the Game-Based Learning approach (GBL), gamification technique (GT), and educational games development programs (EGD) in higher education institutions.
2. Analyze institutional documents (e.g. study programs, subject syllabi Meaning syllabi of the study programs at UNIs which have GBL or EDG courses and policies related to GBL, GT and EGD and other relevant papers/documents.
3. Analyze research papers on game-based learning effectiveness.

3. Research Questions

This section concerns the research questions that will guide the baseline analysis. First, the main research questions are provided, with a detailed explanation of each, and in the further part, a distinction is made for the partners representing various backgrounds (pedagogy and game development) to make the analysis more targeted and less generic.

RQ 1. What is the current state of GBL, GT, and EGD integration into higher education curricula in the partner countries, and what institutional policies and frameworks currently support their implementation?

This question aims to assess both the practical application of Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Game Design (EGD) in higher education curricula and the institutional structures that facilitate or hinder their integration. It provides a holistic view of the educational and administrative landscape regarding GBL, GT and EDG.

Importance in Research Context:

1. Understanding Adoption and Support: By linking curriculum integration with institutional policies, this question evaluates whether there is alignment between pedagogical practices and the strategic frameworks that support them.

1. Identifying Gaps and Opportunities: It highlights disparities between the existence of innovative teaching strategies in curricula and the institutional readiness to sustain them, identifying areas for improvement in both teaching and policy.

1. Informing Interventions: A comprehensive understanding of both implementation and support systems will allow for targeted recommendations to enhance the adoption, scalability, and sustainability of GBL, GT, and EGD syllabi.

RQ 2. What are the common characteristics of courses and syllabi that incorporate GBL and GT practices, as perceived by educators and stakeholders, and what challenges are faced by educators in designing and implementing these elements?

This question seeks to identify shared features in courses and syllabi that leverage game-based learning (GBL) and gamification techniques (GT). By focusing on the perceptions of educators and stakeholders (e.g., administrators, policymakers, students), it provides insights into the practical design and implementation of these practices, highlighting both their effectiveness and associated challenges.

Importance in Research Context:

Effectiveness Assessment: Exploring stakeholders' perceptions of these shared characteristics helps evaluate how well these elements align with educational objectives. This includes assessing their impact on student engagement, motivation, skill development, and overall learning outcomes.

Stakeholder Insights:

Educators: Offer firsthand accounts of the pedagogical reasoning behind incorporating GBL and GT, their effectiveness in meeting course objectives, and the practicalities of application.

Administrators and Policymakers: Provide insights into institutional support, curriculum alignment, and scalability.

Students (Indirectly): Stakeholders' reflections often capture implicit feedback on student experiences and outcomes.

Gap Identification:

Examining shared characteristics reveals discrepancies between the theoretical frameworks of GBL/GT and their practical implementation.

It also highlights challenges such as: limited access to resources or technology; difficulty in balancing innovative methods with standardized curriculum goals; and insufficient professional development for educators.

RQ 3. What best practices can be identified to inform future course and syllabus development?

This question aims to extract actionable insights and successful strategies from existing practices in course and syllabus design, particularly those incorporating GBL, GT, and EGD. By identifying best practices, the research provides a framework for enhancing future course development, ensuring alignment with innovative pedagogical goals and institutional objectives.

Importance in Research Context:

1. **Extracting Proven Strategies**: Best practices highlight effective methods and approaches that have been shown to achieve desired learning outcomes, such as improving student engagement, retention, and critical thinking skills. These practices can guide curriculum designers and educators in integrating GBL, GT, and EGD more effectively.

1. **Scalability and Adaptability**: By identifying practices that work across different contexts and disciplines, the research supports the scalability of these strategies in diverse educational settings. Adaptable practices can address the varying needs of institutions, educators, and learners.

1. **Enhancing Instructional Design:** Incorporating best practices into course and syllabus development ensures that the design process is evidence-based and informed by practical successes. This contributes to a structured and intentional integration of innovative methodologies like GBL and GT.

4. Instruments and Methodology

RQ 1 - Research Focus

Document and analyze how GBL, GT and EDG are currently implemented in higher institutions across respective countries.

Focus your attention on establishing what the core components of successful university courses that focus on game-based learning and educational game development are; how is the curriculum structured to balance theoretical knowledge and practical skills in game-based learning courses or what are the most commonly taught skills and competencies in educational game development courses at leading universities; how do universities integrate interdisciplinary approaches (e.g., combining education, psychology, computer science, and design) in their game-based learning programs; what pedagogical methods are used for teaching game-based learning and educational game development at the university level?

RQ 1 - Responsibility

All partners are responsible for investigating the application of GBL, Gt and EDG in their educational institutions by analyzing available research results.

RQ 1 - Procedure

Literature Review – Collect and review existing academic and policy-related research on the use of GBL and gamification in educational institutions.

RQ 1 - Actions

Identify relevant government reports, policy documents, and guidelines from the Ministry of Education or equivalent in each country.
- Review national and regional education strategies that promote or discourage GBL and gamification, focusing on tertiary education.
- Identify universities, or programs known for innovative use of GBL or gamification.
- Ensure case studies include examples from tertiary levels.
- Obtain syllabi, curriculum outlines, and pedagogical frameworks from selected institutions.
- Review available reports or evaluations on the effectiveness of GBL and gamification.
- Analyze policies, guidelines, or initiatives that promote GBL and gamification in these institutions.

DELIVERABLE - The document in which the findings are to be delivered is attached to the report (APPENDIX 1)

4. Instruments and Methodology

RQ 2 & 3 - Research Focus

Review research papers related to GBL, GT and EGD. Focus on identifying the results pertaining to the effectiveness of and challenges with GBL, GT and EGD implementation.

Focus your attention on establishing how widely are game-based learning (GBL) and gamification techniques being implemented in educational settings, and how well do they align with curriculum goals and learning objectives; how are educational games designed to meet the specific objectives of classroom learning, and how do they ensure alignment with school curricula and integration into existing educational systems; how effective are GBL and gamification techniques in enhancing student engagement, motivation, and learning outcomes, and how are they evaluated in terms of success?; what metrics, frameworks, or processes are used to evaluate the effectiveness of educational games in improving student engagement, learning outcomes, and teacher satisfaction?

RQ 2 & 3 - Responsibility

All partners are responsible for analyzing available research results.

RQ 2 & 3 - Procedure

Literature Review – Collect and review up to date and relevant research papers.

RQ 2 & 3 - Actions

- Define Scope and Search Criteria - Use combinations of keywords such as "Game-Based Learning," "Gamification Techniques," "Educational Game Design," "Effectiveness," and "Challenges."
- Look for papers published within the last 5–10 years, peer-reviewed articles, and studies focused on higher education. Exclude non-educational settings, outdated research, and articles with unclear methodologies.
-use reliable databases, such as: Google Scholar; ERIC (Education Resources Information Center); JSTOR; PubMed (for cognitive and neuroscience aspects); SpringerLink and Elsevier for multidisciplinary studies. Record bibliographic details (author, year, title, journal, DOI) for future citation.
- Skim each paper's abstract and introduction to assess relevance. Focus on results and discussions to extract evidence of: a) Effectiveness: Measured outcomes (e.g., student performance, engagement, retention rates). b) Challenges: Barriers such as technological limitations, teacher adoption, or pedagogical design flaws. Evaluate the quality of evidence based on: Sample size. Methodological rigor (qualitative vs. quantitative). Context of implementation (e.g., classroom, online learning).
- Categorize findings under: a) Effectiveness of GBL, GT, and EGD: What worked, for whom, and why? B) Challenges: Identify common themes such as lack of teacher training, scalability, or cost-effectiveness.
Highlight gaps in research for future studies or analysis.

Tools and Instruments you might find helpful: Citation Tools: Zotero, Mendeley, or EndNote for organizing references.

DELIVERABLE - The document in which the findings are to be delivered is attached to the report (APPENDIX 2)

DELIVERABLES

Baseline Analysis Report:

1. Comparative analysis of GBL, GT, and EGD practices across partner institutions.
2. Identification of best practices, challenges, and gaps.
3. Recommendations for designing needs analysis and syllabus developments.

Supporting Documents:

a. Reporting matrix for RQ 1 is available here
b. Reporting matrix for RQ 2 & RQ 3 is available here

Reporting of the findings:

Here you can find your folder for the data you gather. The are two folders there, one for institutional documents, and one for research. Please try to add sub-folders in the research folder in case your reporting documents concern different things e.g. challenges in implementation or success stories in implementation – that will help with the analysis and reporting.

This baseline analysis ensures a robust foundation for the Learn2Play4Future project, enabling evidence-based planning and decision-making for impactful interventions in GBL and EGD education.

15.12.2024 – 30.04.2025: NEEDS ANALYSIS

AIM: To conduct a needs analysis to identify the specific educational needs and gaps that both, the game-based learning syllabus and educational gamed syllabus will address.

TASKS:

- Administer surveys to students and teachers to assess their learning needs, expectations, and readiness for GBL, GT and EGD (min. 200 respondents)
- Analyze curriculum documents to align learning outcomes with institutional goals
- Hold interviews or focus groups with educators, administrators and students to gather in-depth qualitative data.

OUTCOME: Needs analysis report to guide syllabus development.

DEADLINES:

TASKS		DATES	Who's responsible
1.	Preparing a detailed plan for the needs analysis with instruments to be used and reporting chart to be employed by the partners	15.12.2024 - **30.01.2025**	UBB
2.	Gathering data	30.01.2025 - **31.03.2025**	ALL PARTNERS
3.	Analysing the gathered data and preparing the needs analysis report	01.04.2025 - **29.04.2025**	ALL PARTNERS & UBB
4.	Document publication	**30.04.2025**	UBB & UCM

Additional documents regarding this stage:

1. Needs analysis - a detailed plan.

WP 4 – NEEDS ANALYSIS
Effectiveness and Impact of Games in Diverse Learning Environments

The purpose of a needs analysis, particularly before syllabus creation, is to ensure that the curriculum or educational content is closely aligned with the actual requirements, abilities, and interests of the target audience, as well as institutional and broader educational goals. Conducting a needs analysis helps to make the syllabus relevant, effective, and learner-centred (Nation & Macalister, 2010).

In particular, needs analysis helps in identifying learner needs and expectations, so that the content of the course is neither too advanced nor too simplistic, and as such is more likely to engage students and facilitate effective learning outcomes by, eg. increasing their motivation to learn. Moreover, it helps to ensure that the learning objectives of the course are aligned with the desired learning outcomes. A needs analysis helps in determining the specific competencies, skills, and knowledge that learners need to acquire by the end of the course. Finally, it can help in establishing whether the syllabus not only meets individual learner needs but also complies with broader institutional or educational policy goals; it also aims to determine the appropriate structure and sequence of topics based on learners' existing knowledge, so that a logical progression of topics and tasks is retained (Brown, 1995; Nation & Macalister, 2005). In the context of the project, the purpose of a needs analysis before syllabus creation is to ensure that the educational content is designed to meet the learners' actual needs, align with institutional goals, and be delivered in the most effective and engaging way. This process leads to a more targeted, relevant, and successful educational experience for both learners and educators.

In the context of the **Learn2Play4Future** project, the needs analysis will assess:

- the specific educational needs and gaps that both, the game-based learning syllabus and educational gamed syllabus will address.

The findings will form the foundation for designing the syllabi to be used in GBL and EGD courses.

Effectiveness and Impact of Games in Diverse Learning Environments

Numerous studies (e.g. Deterding et al., 2011; Plass et al., 2015), have validated the positive effects of gamification on student motivation, engagement, and academic performance. Gamification introduces elements like rewards, progress tracking, and competition, which enhance student involvement and make learning experiences more interactive. Yet, the success of GBL initiatives depends heavily on teacher training. Kebritchi et al. (2010) found that teachers who receive specialized training in GBL are more effective at integrating it into their classrooms and achieving better learning outcomes for students. Conversely, a lack of training can lead to ineffective implementation and resistance from educators. While GBL has the potential to transform education, its adoption is often hindered by a lack of institutional readiness, insufficient teacher training, and the absence of robust evaluation frameworks. Identifying these gaps early through baseline research can help shape more effective interventions.

This phase moves into testing and evaluating the impact of GBL,GT and EGD training.

2. Aims

- To identify students learning needs, expectations, and readiness for GBL, GT and EGD (min. 200 respondents in mixed research)
- To identify teachers and educations perceptions of GBL, GT and EDG courses implementation.

Objectives:

1. Conduct survey (mixed) research with min. 200 respondents from partner countries aimed at identifying students & teachers' needs, expectations, and readiness for GBL, GT and EGD (min. 200 respondents in mixed research)

1. To hold interviews or focus groups with educators and administrators to gather qualitative data on GBL, GT and EDG courses implementation (to gather in-depth understanding of their perceptions regarding GBL, GT and EDG.

3. Research Questions

This section concerns the research questions that will guide the needs analysis. The questions provided in this part are divided into those regarding GBL and GT methodologies and the ones concerning EDG courses, and they aim to harness towards educators and developers' opinions, and those regarding students' perceptions.

	UBB & CUBA	XAMK, UCM & IG
RQ 1	In teachers' opinions, what challenges and barriers exist in integrating GBL and gamification into educational practices (e.g., time, technical limitations), and what gaps in content, usability, or accessibility are evident in current tools?	What challenges do developers face in ensuring their educational games are user-friendly, easily integrated into school systems, and compatible with existing technological infrastructures?
RQ 2	To what extent do educators feel trained and supported in implementing GBL, and how do the pedagogical strategies used align with recognized best practices?	How do developers gather and incorporate feedback from educators regarding gaps in content, usability, and functionality, and how is this feedback used to improve game design?
RQ 3	What feedback mechanisms exist between educators and developers to improve educational games, and how sustainable are GBL and gamification techniques in long-term teaching strategies?	What training and support are provided to educators using educational games, and what strategies are in place to ensure the long-term relevance and sustainability of educational games in changing educational environments?

RQ 1 - Challenges and Barriers in GBL and Gamification

For Educators (UBB & CUBA):

In teachers' opinions, what challenges and barriers exist in integrating GBL and gamification into educational practices (e.g., time, technical limitations), and what gaps in content, usability, or accessibility are evident in current tools?
Description: This question explores educators' perspectives on the practical difficulties they face when adopting GBL and gamification methods in their teaching. It also investigates gaps in the tools and resources currently available.
Importance in Research Context:

- Identifies specific hurdles, such as lack of time, training, or institutional support, that prevent effective adoption.
- Provides insights into the usability and inclusivity of current GBL tools, ensuring future developments address these shortcomings.

For Developers (XAMK, UCM, & IG):

What challenges do developers face in ensuring their educational games are user-friendly, easily integrated into school systems, and compatible with existing technological infrastructures?

- Description: This question examines the technical and design challenges developers encounter when creating educational games suitable for diverse educational settings.

Importance in Research Context:

- Highlights issues of compatibility with school infrastructure and the need for seamless integration.

Emphasizes the importance of user-centered design to enhance teacher and student experiences with educational games.

RQ 2: Educator Training and Feedback Integration

For Educators (UBB & CUBA):

To what extent do educators feel trained and supported in implementing GBL, and how do the pedagogical strategies used align with recognized best practices?
Description: This question focuses on the level of training and institutional support provided to educators for GBL implementation. It also assesses whether their teaching strategies align with established pedagogical frameworks.
Importance in Research Context:

- Identifies gaps in professional development and training that could hinder effective adoption of GBL.
- Evaluates the extent to which educators' approaches align with best practices, ensuring educational effectiveness and consistency.
-

For Developers (XAMK, UCM, & IG):

How do developers gather and incorporate feedback from educators regarding gaps in content, usability, and functionality, and how is this feedback used to improve game design?
Description: This question explores the mechanisms developers use to solicit feedback from educators and how this input informs the iterative design process.
Importance in Research Context:

- Strengthens collaboration between educators and developers to create more effective tools.
- Ensures that the games address real-world teaching challenges and provide practical value.
-

RQ 3: Feedback Mechanisms and Sustainability

For Educators (UBB & CUBA):

What feedback mechanisms exist between educators and developers to improve educational games, and how sustainable are GBL and gamification techniques in long-term teaching strategies?
Description: This question investigates the existing communication channels between educators and developers and evaluates the long-term viability of GBL and gamification in education.
Importance in Research Context:

- Encourages the establishment of effective feedback loops to refine educational tools.
- Examines the potential for sustainable adoption of GBL methods, ensuring they remain relevant and impactful over time.
-

For Developers (XAMK, UCM, & IG):

What training and support are provided to educators using educational games, and what strategies are in place to ensure the long-term relevance and sustainability of educational games in changing educational environments?
Description: This question looks at how developers assist educators in using their tools effectively and plans for keeping educational games adaptable to evolving educational needs.
Importance in Research Context:

- Highlights the importance of post-development support to maximize the tools' usability and effectiveness.
- Focuses on strategies to future-proof educational games, maintaining their relevance in a dynamic educational landscape.

QUANTITATIVE ANALYSIS REGARDING STUDENTS' PERCEPTIONS

	UBB & CUBA	XAMK, UCM & IG
RQ 1	What are students' learning needs, expectations, and readiness for Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Game Design (EGD)?	
RQ 2	What types of games or game mechanics are students most familiar with, and how do these preferences influence their engagement with the learning content?	
RQ 3	How confident are students in their ability to use technology effectively for GBL, GT, and EGD?	
RQ 4	What are students' preferred modes of interaction (individual vs. collaborative) in game-based or gamified learning environments?	
RQ 5	How do students perceive the effectiveness of GBL, GT in enhancing their learning experience?	What competencies and skills do game development students believe are necessary for creating effective educational games?

For Students

RQ 1: What are students' learning needs, expectations, and readiness for Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Game Design (EGD)?

Description:

This question explores the extent to which students are prepared for and open to using GBL, GT, and EGD in their educational experiences. It also examines their expectations regarding these innovative teaching methodologies and how they perceive their potential benefits.

Importance in Research Context:

- Tailoring Educational Tools: Helps ensure that GBL and EGD tools align with students' actual needs and readiness, improving engagement and effectiveness.
- Identifying Gaps in Readiness: Pinpoints areas where students may lack exposure or preparedness, guiding the development of introductory resources or training.
- Enhancing Motivation and Engagement: Informs syllabus design to align with students' expectations, fostering enthusiasm and participation in learning activities.

RQ 2: What types of games or game mechanics are students most familiar with, and how do these preferences influence their engagement with the learning content?

Description:

This question examines the gaming experiences and preferences of students, focusing on specific mechanics such as rewards, challenges, or collaboration. It seeks to understand how these familiar elements affect their engagement in gamified learning environments.

Importance in Research Context:

- **Enhancing Design Relevance:** Helps integrate preferred game mechanics into educational content, creating a sense of familiarity and enjoyment.
- **Improving Engagement:** Identifies the elements that students find most motivating, informing the design of more captivating educational games.

Customizing Content: Allows for the alignment of learning tools with students' preferences to foster deeper engagement and improved learning outcomes.

RQ 3: How confident are students in their ability to use technology effectively for GBL, GT, and EGD?
Description:
This question assesses students' digital literacy and confidence in navigating technological platforms required for GBL, GT, and EGD. It identifies potential barriers, such as lack of skills or comfort with technology, that could hinder successful engagement.

Importance in Research Context:

- **Addressing Digital Gaps:** Highlights areas where students need support to effectively use gamified or game-based tools.
- **Maximizing Accessibility:** Ensures that tools are designed to be intuitive and accessible for users with varying levels of technological proficiency.
- **Enhancing Implementation:** Facilitates a smoother integration of GBL and EGD by addressing student concerns about their technological readiness.

RQ 4: What are students' preferred modes of interaction (individual vs. collaborative) in game-based or gamified learning environments?
Description:
This question explores whether students prefer individual, competitive, or collaborative interactions when engaging with GBL or gamified activities. It aims to align game design with their preferred modes of participation.
Importance in Research Context:

- **Optimizing Engagement:** Ensures that game mechanics are designed to reflect students' preferred interaction styles, boosting motivation and involvement.
- **Supporting Diverse Needs:** Accounts for varied preferences among students, allowing for the development of adaptable and inclusive learning tools.
- **Enhancing Learning Outcomes:** Aligns interaction modes with pedagogical objectives, maximizing the effectiveness of gamified learning environments.

For Pedagogy Students (UBB & CUBA)

RQ 5: How do students perceive the effectiveness of GBL and GT in enhancing their learning experience?
Description:
This question seeks to understand students' opinions on how well GBL and GT improve their learning outcomes, including engagement, comprehension, and retention. It also probes for limitations or areas where students feel these methods fall short.
Importance in Research Context:

- **Validating Impact:** Provides evidence of the perceived educational value of GBL and GT, reinforcing their adoption in syllabi.
- **Informing Improvements:** Identifies specific aspects of GBL and GT that resonate with students or need refinement to maximize learning effectiveness.
- **Promoting Engagement:** Highlights strategies that students believe make learning more interactive and enjoyable, leading to better outcomes.

RQ 5: What competencies and skills do game development students believe are necessary for creating effective educational games?

Description:
This question investigates the technical, creative, and pedagogical skills that game development students perceive as critical for designing educational games that balance engagement and learning effectiveness.

Importance in Research Context:

- **Aligning Curriculum:** Ensures the syllabus addresses any gaps in skills or knowledge, preparing students for the specific demands of educational game design.
- **Fostering Multidisciplinary Skills:** Highlights the balance between technical proficiency and an understanding of educational principles.
- **Preparing for Industry Needs:** Provides insights into the skills students believe are most relevant, ensuring alignment with real-world expectations.

By addressing these questions, the analysis provides actionable insights into student needs, preferences, and competencies, ensuring that educational tools and syllabi are both relevant and impactful.

Document Analysis for the mixed research part

Task	Details
Research Focus	Investigate the perceptions, challenges, and feedback mechanisms associated with GBL, GT, and EGD implementation in educational institutions and game development contexts.
Responsibility	All partners are responsible for conducting questionnaires and interviews with educators and/or administrators, and game developers to analyze their perspectives on GBL, GT, and EGD integration.
Procedure	Semi-Structured Interviews and questionnaires – Conduct qualitative interviews and quantitative questionnaires with key stakeholders to gather insights on barriers, training needs, feedback processes, and sustainability strategies.
Actions	- Develop a semi-structured interview guide based on research questions for educators and developers and a questionnaire to gather both quantitative and qualitative feedback - Identify and recruit participants from diverse educational and game development contexts, ensuring representation from all partner countries. - Schedule and conduct questionnaires/interviews using an agreed format (online or in-person) and record the discussions with consent. - Transcribe interviews verbatim and organize data for thematic analysis. - Code the quantitative data and analyze it to identify key themes, challenges, and opportunities for GBL, GT, and EGD implementation. - Compare findings across countries and institutions to identify trends, gaps, and unique insights.
Deliverable	A comprehensive mixed analysis report, detailing findings from interviews, thematic categories, and actionable recommendations. Partners will contribute their respective country-specific findings to a consolidated document.

Document Analysis for Quantitative Part

Task	Details
Research Focus	Gather measurable data on students' perceptions, readiness, and preferences regarding GBL, GT, and EGD in educational contexts.
Responsibility	All partners are responsible for designing and distributing surveys to target groups (students and educators) and analyzing the quantitative data.
Procedure	Survey Research – Develop, distribute, and analyze structured surveys to collect quantitative data on key research questions.
Actions	- Develop survey instruments based on the research questions, ensuring alignment with the goals of the study. - Translate surveys into relevant languages for partner countries to ensure accessibility. - Pilot test surveys to ensure clarity and validity of questions. - Distribute surveys to a representative sample (minimum of 200 respondents) using online tools (e.g., Google Forms, Qualtrics, or SurveyMonkey). - Collect demographic data (age, academic field, prior experience with GBL/GT/EGD) to enable segmentation and analysis. - Analyze data using statistical tools (e.g., SPSS, PSPP, Excel) to generate descriptive and inferential statistics. - Identify trends, gaps, and patterns in responses related to readiness, effectiveness, preferences, and interaction modes.
Deliverable	A quantitative analysis report containing key findings, visual data representations (e.g., graphs, charts, tables), and actionable recommendations based on the data. Partners will contribute their country-specific survey results for a consolidated report.

4. Instruments and supplementary documents

Qualitative survey and procedure of its application is to be found here - attached to the report (APPENDIX 3)

Quantitative survey and procedure of its application is to be found here - attached to the report (APPENDIX 4)

Needs analysis report to guide syllabus development.

INCLUSION GUIDELINES

A. In your research, try to verify data concerning a variety of educational institutions (e.g., public, private, urban, rural) to ensure that the effectiveness of the GBL and EGD syllabi is evaluated across different learning environments and contexts.

B. Include students from diverse socio-economic, cultural, and linguistic backgrounds to ensure that the syllabi and educational games are accessible and effective for all.

C. Make specific efforts to include students with different learning needs, including those with disabilities, to assess how well the syllabi support inclusive education practices.

D. Involve educators from various teaching backgrounds (e.g., years of experience, subject matter expertise, familiarity with GBL) to understand how different levels of experience impact the implementation of the GBL and EGD syllabi.

E. If possible, ensure gender diversity among educators participating in the study to provide balanced insights into the challenges and successes in implementing the syllabi.

F. Include game developers with varied experience levels in educational game design, from novices to experts, to understand how different approaches to development influence the educational impact of the games.

G. Ensure that developers are involved throughout the research process, from design to post-intervention feedback, to guarantee that their insights contribute to improving the final product.

H. Ensure that educational games and tools are accessible on a wide range of technological devices, including low-resource settings, to accommodate schools with varying levels of technological infrastructure.

I. Include students with special educational needs and disabilities to assess the accessibility features of the games and how well they integrate into inclusive classroom environments.

J. Obtain informed consent from all participants (students and developers) and ensure that participation is voluntary and that participants understand their rights, including the right to withdraw from the study at any time.

K. Ensure that all collected data are anonymized and stored securely to protect the privacy and confidentiality of participants, in compliance with ethical research standards.

L. Ensure that diverse perspectives are incorporated into the iterative refinement process for the syllabi and games, with attention given to underrepresented groups.

These inclusion guidelines ensure that the research is both comprehensive and representative of a broad range of participants, providing a richer and more valid assessment of the project's interventions.

REPORTING AND DISSEMINATION

Regular interim reports will be produced throughout the project to monitor and track progress, ensuring that key milestones are met on time and adjustments can be made when necessary. At the end of the project, a final comprehensive evaluation report will be published, summarising the outcomes, key findings, and long-term impacts of the Edu Game Maker Toolbox and gamification-based learning methods.

The project's dissemination efforts will focus on sharing these findings through various channels, including academic publishing in peer-reviewed journals and presenting the results at relevant conferences. These efforts aim to reach both the educational research community and practitioners, ensuring that the knowledge gained is widely accessible and can be applied in different educational contexts.

VISUALISATION OF THE WP 4 ACTIVITIES

DATA COLLECTION TOOLS

A variety of tools will be used to gather valuable insights throughout the project. Engagement surveys will help us understand how motivated and involved students are, while teacher feedback questionnaires will give us a sense of how educators feel about the Edu Game Maker Toolbox and how well it works in practice.

At different stages, we'll also run focus group interviews to gather more personal and detailed feedback from participants. In addition, document analysis and a literature review framework will allow us to explore existing research and identify gaps in current teaching methods, helping to shape our approach.

To track progress, pre- and post-tests will be used to measure students' learning and skill development, and classroom observation grids will let us monitor things like interaction, collaboration, and problem-solving in the classroom environment

DATA ANALYSIS

- Document Analysis: Systematic Research Review
- Statistical Analysis: ANOVA, T-tests, and regression models to analyze survey and test data.
- Thematic Analysis: Identify key themes from interview and focus group transcripts.
- UX Analysis: Assess how teachers and students interact with the Edu Game Maker Toolbox.

REFERENCES

1. **Brown, J. D.** (1995). The Elements of Language Curriculum: A Systematic Approach to Program Development. Heinle & Heinle Publishers.
2. **Chen, H. T.** (2005). Practical Program Evaluation: Assessing and Improving Planning, Implementation, and Effectiveness. SAGE Publications.
3. **Cohen, L., Manion, L., & Morrison, K.** (2007). Research Methods in Education (6th ed.). Routledge.
4. **Connolly, T. M., Boyle, E. A., MacArthur, E., Hainey, T., & Boyle, J. M.** (2012). A systematic literature review of empirical evidence on computer games and serious games. Computers & Education, 59(2), 661-686.
5. **Creswell, J. W.** (2009). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (4th ed.). SAGE Publications.
6. **Deterding, S., Dixon, D., Khaled, R., & Nacke, L.** (2011). From game design elements to gamefulness: Defining "gamification". In Proceedings of the 15th International Academic MindTrek Conference: Envisioning future media environments (pp. 9-15).
7. **Gee, J. P**. (2003). What video games have to teach us about learning and literacy. Palgrave Macmillan.
8. **Kebritchi, M., Hirumi, A., & Bai, H.** (2010). The effects of modern mathematics computer games on mathematics achievement and class motivation. Computers & Education, 55(2), 427-443.
9. **Nation, I. S. P., & Macalister, J.** (2010). Language Curriculum Design. Routledge.
10. **Plass, J. L., Homer, B. D., & Kinzer, C. K.** (2015). Foundations of game-based learning. Educational Psychologist, 50(4), 258-283.
11. **Rossi, P. H., Lipsey, M. W., & Freeman, H. E.** (2004). Evaluation: A Systematic Approach (7th ed.). SAGE Publications.
12. **Schön, D. A.** (1983). The Reflective Practitioner: How Professionals Think in Action. Basic Books.
13. **Westera, W.** (2019). Why and How Serious Games can Become Far More Effective: Accommodating Productive Learning Experiences, Learner Motivation and the Monitoring of Learning Gains. Educational Technology & Society, 22 (1), 113– 123.

APPENDIX 1

Instrument for Document Analysis: Review of Study Programs, Subject Syllabi, and Institutional Policies Related to Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Game Design (EGD)

Document Identification Section							
Type of Document (mark with x)	Study Program		Subject Syllabus		Policy document		Other – please specify
Title							
Author/Publisher							
Date of Publication		**Institute/organization**					
Keywords							
Content Analysis Section							
Are there explicit mentions of GBL, GT, or EGD in the document?						**YES**	**NO**
If yes, specify the objectives or goals associated with GBL, GT, or EGD (e.g. The main objective							
Are these objectives aligned with broader institutional educational goals?						**YES**	**NO**
Methodologies							
Are specific teaching or instructional methodologies related to GBL, GT, or EGD mentioned?						**YES**	**NO**
Specify the methodologies described (e.g., project-based learning, simulation, adaptive learning).							
Are methodologies supported by a rationale or evidence-based practices?						**YES**	**NO**
Are assessment mechanisms for these methodologies detailed in the document?						**YES**	**NO**
Institutional Support Structures							
Are institutional policies or guidelines provided for implementing GBL, GT, or EGD?						**YES**	**NO**
If yes, describe these policies or guidelines (e.g. Institutional grants are available for integrating							
Are professional development opportunities for staff in GBL, GT, or EGD mentioned?						**YES**	**NO**
Are there references to technology, infrastructure, or tools that support GBL, GT, or EGD?						**YES**	**NO**
General Evaluation Section							
What is the overall emphasis on GBL, GT, and EGD in the document?		**LOW**		**MODERATE**		**HIGH**	
Are there gaps or inconsistencies in addressing GBL, GT, or EGD?						**YES**	**NO**
If yes, specify:							
Notes and Observations Section							
Provide additional relevant observations or insights not covered above.							
Identify recurring themes or patterns across multiple documents.							

APPENDIX 2

Instrument for Research Results Synthesis: Review of research papers regarding the effectiveness of and challenges connected with GBL, GT and EGD programs.

Publication Identification Section									
Type of the publication	Empirical research		Meta-analysis		Literature review		Case-study		Conceptual framework	
Title										
Author/Publisher/ IF										
DOI										
Date of Publication				**Author's institute/organization**						
Keywords										
Primary Focus of the Paper (e.g., the *effectiveness of GBL in STEM education, gamification in higher education)*										
Does the paper explicitly state its objectives?								**YES**		**NO**
What are they?										
Are RQ and/or hypotheses clearly defined?								**YES**		**NO**
List the key research questions/ hypotheses:										
Type of study	Qualitative		Quantitative				Mixed-methods			
Population	Students		Teachers		Institutions		Other			
Sample characteristics	Random		Convenience				Purposive			
Data collection methods	Surveys/Questionnaires; Interviews/Focus Groups; Observations; Experiments; Other (please specify):									
Data analysis methods (e.g. *thematic analysis, statistical testing, content analysis)*										

APPENDIX 2

Does the paper provide clear and concise findings?	**YES**	**NO**
If yes, please summarize the findings pertaining to		
a) effectiveness of GBL/GT/EDG		
b) challenges in implementation of GBL/GT/EGD		

Does the paper discuss how GBL/GT influenced learning outcomes?		**YES**	**NO**
If yes, specify the outcomes:			
Does the paper compare GBL/GT with traditional methods?		**YES**	**NO**
If yes, summarize the comparison:			
Are the implications of the findings clearly stated?		**YES**	**NO**
If yes, summarize the implications pertaining to:			
c) Educational practice			
c) Policy development			
c) Future research			
Are there any best practices for implementing BBL/GT/EDG mentioned?		**YES**	**NO**
If yes, list the practices			
Identify the key strength of the paper			
List limitations (acknowledged by the Author, or identified)			
Additional comments			

APPENDIX 3

Semi-Structured Interview Scheme

The semi-structured interviews are designed to explore the experiences, perceptions, and insights of two key groups: **educators** (teachers) and **developers**. These interviews will use a mix of predefined questions to guide the discussion, while allowing flexibility to explore emergent themes.

The aim is to identify:

- For educators: The challenges, gaps, and support systems related to implementing Game-Based Learning (GBL) and gamification in their teaching practices.
- For developers: The challenges, feedback integration mechanisms, and sustainability strategies in creating educational games.
-

Procedure

Participant Recruitment:

Identify participants:

Educators: Teachers and administrators involved in GBL, gamification, or educational game use.

Developers: Game designers, project managers, and developers working on educational games.

Ensure a diverse sample based on geography, experience levels, and institutional contexts.

Interview Preparation:

Develop interview guidelines based on the research questions.

Train interviewers to maintain consistency and follow-up on emerging themes.

Obtain informed consent, ensuring participants understand the purpose, confidentiality, and voluntary nature of their participation.

Conducting the Interviews:

Duration: 15-30 minutes per interview.

Mode: Online or in-person, depending on participant availability.

Tools: Audio recording (with permission) and note-taking to ensure accurate data capture.

Post-Interview Processing:

Transcribe recordings verbatim.

Perform a thematic analysis to identify key themes, patterns, and relationships.

Reporting Findings:

Use thematic coding to organize data into categories aligned with the research questions.

Present findings in a narrative format, supported by illustrative quotes.

Highlight actionable insights and implications for syllabus design and implementation.

APPENDIX 3

Interview Scheme for Educators

Introduction:,

- Brief overview of the research purpose.
- Reassure confidentiality and voluntary participation.

Warm-Up Questions:

1. Can you share your current teaching role and experience with GBL or gamification?
2. What kinds of tools or methods do you use to integrate technology into your teaching?

Core Questions:

Challenges and Barriers (RQ 1):

1. What challenges have you faced in implementing GBL or gamification in your teaching practices?
2. Are there specific tools or resources that you find difficult to use or adapt to your needs?
3. How do time constraints or technical limitations impact your ability to use these methods effectively?

Training and Support (RQ 2):

4. Do you feel adequately trained and supported to use GBL and gamification? If not, what support would be helpful?
5. How do the pedagogical strategies you use align with best practices for GBL or gamification?

Feedback Mechanisms and Sustainability (RQ 3):

6. How do you provide feedback to developers or administrators about the tools or games you use?
7. Do you feel these methods (GBL, gamification) are sustainable long-term? Why or why not?

Closing Questions:

8. What improvements or changes would make GBL and gamification more effective in your teaching?
9. Is there anything else you'd like to share about your experiences with these methods?

Other comments:

Interview Scheme for Developers

Introduction:

- Overview of the research and goals of the interview.
- Emphasize the importance of their expertise in improving educational game design.

Warm-Up Questions:

1. Can you describe your role and experience in educational game development?
2. What types of educational games have you worked on, and who is your primary audience?

Core Questions:

Challenges and Barriers (RQ 1):

1. What are the biggest challenges you face in creating games that are user-friendly and easily integrated into educational environments?
2. How do you ensure compatibility with the existing technological infrastructure of schools?
3. Are there particular aspects of usability, accessibility, or content design that are especially difficult to address?

Feedback Integration (RQ 2):

4. How do you gather feedback from educators regarding your tools or games?
5. Can you describe how you incorporate this feedback into your development process?

Sustainability and Long-Term Relevance (RQ 3):

6. What strategies do you use to ensure the long-term relevance and adaptability of your games in changing educational environments?
7. How do you train or support educators in using the games you develop?

Closing Questions:

8. What do you see as the most critical factor in making educational games successful in schools?
9. Is there anything else you'd like to share about your experiences with educational game design?

APPENDIX 3

1. Data Organization:
Transcribe interviews and segment data into themes using qualitative analysis tools (e.g., NVivo, ATLAS.ti).

2. Thematic Analysis:
Code the data according to themes aligned with the research questions:

- Challenges and barriers.
- Training and support.
- Feedback mechanisms.
- Sustainability.

3. Narrative Reporting:
Provide a detailed report with:

- Summaries of key findings for each group.
- Comparative analysis between educators' and developers' perspectives.
- Direct quotes to illustrate insights and support conclusions.

4. Project orientated goal:
Synthesize findings into practical recommendations for creating effective and targeted syllabi on GBL, gamification, and educational game design.

Highlight strategies for collaboration between educators and developers.

Consent Form for Participation in the Interview

You are being invited to participate in an interview as part of a research Learn2Play4Future project conducted by [Institution/Organization Name]. This interview aims to understand your perspectives and experiences related to GBL, GT, and EGD. Your participation is entirely voluntary.

The purpose of this study is to explore the challenges, opportunities, and feedback mechanisms associated with the use and development of game-based and gamified learning methods. The findings will contribute to the design and implementation of effective educational tools and syllabi.

Your Participation involves taking part in an interview that will last app. 20-30 minutes that can be conducted in person or online. You will be asked questions about your experiences, perceptions, and challenges related to GBL, GT, or EGD. With your permission, the interview will be audio-recorded to ensure accurate data collection.

Your responses will remain confidential and anonymous and your participation is entirely voluntary throughout the whole interview. Any identifying information will be removed or anonymized in the final analysis and reporting. Only the research team will have access to the raw data. Results will be presented in aggregated form to protect individual identities.
Please read the following statements and indicate your agreement by signing below:

1. I have read and understood the information provided in this form.
2. I understand that my participation is voluntary and that I may withdraw at any time without penalty.
3. I agree to the audio recording of the interview for research purposes.
4. I consent to participate in this study.

Participant's Name: _____
Participant's Signature: _____
Date: _____
Researcher's Declaration:
I confirm that I have explained the nature and purpose of the study to the participant and have answered any questions to the best of my ability.
Researcher's Name: _____
Researcher's Signature: _____
Date: _____
Thank you for your participation! Your contribution is invaluable to this research.

APPENDIX 4

QUANTITATIVE PART

There are 4 stakeholder groups, the opinions of whom we need to investigate in detail in the needs analysis. That is why we have created four instruments for you to use.

QUESTIONNAIRE 1 – UNIVERSITY TEACHERS UBB & CUBA		
	RESEARCH QUESTIONS	**CORRESPONDING QUESTIONNAIRE ITEMS**
RQ 1	In teachers' opinions, what challenges and barriers exist in integrating GBL and gamification into educational practices (e.g., time, technical limitations), and what gaps in content, usability, or accessibility are evident in current tools?	6, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18
RQ 2	To what extent do educators feel trained and supported in implementing GBL, and how do the pedagogical strategies used align with recognized best practices?	4,5, 9, 10, 19, 20, 21
RQ 3	What feedback mechanisms exist between educators and developers to improve educational games, and how sustainable are GBL and gamification techniques in long-term teaching strategies?	22, 23, 24

1. **Questionnaire for university teachers at UBB & CUBA is to be found here**
2. **Excel Sheet for coding is to be found here**
3. **Explanation of the coding scheme is to be found here**

APPENDIX 4

QUESTIONNAIRE 2. UNIVERSITY TEACHERS & GAME DEVELOPERS XAMK, UMC, IG		
	RESEARCH QUESTIONS	**CORRESPONDING QUESTIONNAIRE ITEMS**
RQ 1	What challenges do developers face in ensuring their educational games are user-friendly, easily integrated into school systems, and compatible with existing technological infrastructures?	**4,5,10,11, 12, 13, 14, 15, 20**
RQ 2	How do developers gather and incorporate feedback from educators regarding gaps in content, usability, and functionality, and how is this feedback used to improve game design?	**6,7,8,9,18,19,21**
RQ 3	What training and support are provided to educators using educational games, and what strategies are in place to ensure the long-term relevance and sustainability of educational games in changing educational environments?	**16,17,22**

1. **Questionnaire for university teachers and game developers at XAMK, UMC and IG is to be found here**
2. **Excel Sheet for coding is to be found here**
3. **Explanation of the coding scheme is to be found here**

REFERENCES:

Brandl, L. C., Kordts, B., & Schrader, A. (2023). Technological Challenges of Ambient Serious Games in Higher Education. *arXiv preprint arXiv:2311.16888*.

Connolly, T. M., Boyle, E. A., MacArthur, E., Hainey, T., & Boyle, J. M. (2012). A systematic literature review of empirical evidence on computer games and serious games. *Computers & Education*, 59(2), 661-686.

J. Hamari, J. Koivisto and H. Sarsa, "Does Gamification Work? -- A Literature Review of Empirical Studies on Gamification," *2014 47th Hawaii International Conference on System Sciences*, Waikoloa, HI, USA, 2014, pp. 3025-3034, doi: 10.1109/HICSS.2014.377.

Shute, V. J., & Zapata-Rivera, D. (2008). Adaptive educational systems. In *Handbook of research on educational communications and technology* (pp. 277-294). Lawrence Erlbaum Associates.

Wouters, P., & van Oostendorp, H. (2013). A meta-analytic review of the role of instructional support in game-based learning. *Computers & Education*, 60(1), 412-425.

APPENDIX 4

QUESTIONNAIRE 3 – STUDENTS' PERCEPTIONS UBB & CUBA		
	RESEARCH QUESTIONS	**CORRESPONDING QUESTIONNAIRE ITEMS**
RQ 1	What are students' learning needs, expectations, and readiness for Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Game Design (EGD)?	**6,7,8, 10, 25**
RQ 2	What types of games or game mechanics are students most familiar with, and how do these preferences influence their engagement with the learning content?	**9,11,12,13,14**
RQ 3	How confident are students in their ability to use technology effectively for GBL, GT, and EGD?	**20, 21**
RQ 4	What are students' preferred modes of interaction (individual vs. collaborative) in game-based or gamified learning environments?	**15, 16, 17**
RQ 5	How do students perceive the effectiveness of GBL, GT in enhancing their learning experience?	**18, 19, 22, 23, 24**

1. **Questionnaire for university teachers at UBB & CUBA is to be found here**
2. **Excel Sheet for coding is to be found here**
3. **Explanation of the coding scheme is to be found here**

QUESTIONNAIRE 4 – STUDENTS' PERCEPTIONS XAMK, UMC		
	RESEARCH QUESTIONS	**CORRESPONDING QUESTIONNAIRE ITEMS**
RQ 1	What are students' learning needs, expectations, and readiness for Game-Based Learning (GBL), Gamification Techniques (GT), and Educational Game Design (EGD)?	
RQ 2	What types of games or game mechanics are students most familiar with, and how do these preferences influence their engagement with the learning content?	
RQ 3	How confident are students in their ability to use technology effectively for GBL, GT, and EGD?	
RQ 4	What are students' preferred modes of interaction (individual vs. collaborative) in game-based or gamified learning environments?	
RQ 5	What competencies and skills do game development students believe are necessary for creating effective educational games?	

4. **Questionnaire for university students at XAMK and UMC is to be found here**
5. **Excel Sheet for coding is to be found here**
6. **Explanation of the coding scheme is to be found here**

APPENDIX 4

Questionnaire for University Teachers

PEDAGOGY AND TEACHER TRAINING

Gender: Female ☐ Male ☐ Prefer not to say ☐ Non-binary/Another gender identity ☐

1. What is your primary role?
   a. Primary or secondary school teacher
   b. University lecturer
   c. Teacher trainer
   d. Other: _____
2. How many years of teaching experience do you have?
   a. 0–5 years
   b. 6–10 years
   c. Over 10 years
3. What type of courses do you teach? *(Select all that apply)*
   a. English as a Foreign Language (EFL)
   b. General pedagogy
   c. Teacher preparation courses
   d. Other: _____
4. In how many courses/workshops related to gamification or game-based teaching have you participated so far:.....
5. In how many courses/workshops related to using digital tools have you participated so far: .....

Mark all statements on a scale from 1- not at all to 5 -very much

6. Which teaching methods do you find most effective in engaging your students?
   a. Teacher-oriented (lectures, guided learning) 1 2 3 4 5
   b. Student-oriented (interactive, self-directed learning) 1 2 3 4 5
   c. Blended learning (mix of online and in-person components) 1 2 3 4 5
7. How do you currently structure your teaching?
   a. Mostly lectures with teacher guidance 1 2 3 4 5
   b. Interactive workshops and discussions 1 2 3 4 5
   c. A mix of lectures, group work, and independent tasks 1 2 3 4 5
   d. Other: _____
8. What format of materials do you prefer to use during your lessons?
   a) Physical handouts and textbooks 1 2 3 4 5
   b) Digital resources (e.g., PDFs, online platforms) 1 2 3 4 5
   c) Interactive content (e.g., quizzes, apps, games) 1 2 3 4 5
   d) Self-paced learning input 1 2 3 4 5
   e) Other: _____

APPENDIX 4

9. How familiar are you with the following concepts?
   a) Gamification (e.g., use of game mechanics like points, badges, leaderboards) 1 2 3 4 5
   b) Game-based learning (e.g., using full games to teach concepts or skills) 1 2 3 4 5
   c) Educational game design (e.g., designing a game to teach specific concept/skill) 1 2 3 4 5
10. How prepared do you feel to integrate the following into your teaching:
   a) Game-based learning 1 2 3 4 5
   b) Gamification techniques 1 2 3 4 5
   c) Educational game design activities 1 2 3 4 5
11. What are your biggest concerns about using gamification or GBL in your teaching practice?
   a) Lack of time to integrate into the curriculum 1 2 3 4 5
   b) Inadequate resources (e.g., technology, training) 1 2 3 4 5
   c) Difficulty balancing fun and educational objectives 1 2 3 4 5
   d) Limited accessibility for diverse learners (e.g., SEN students) 1 2 3 4 5
   e) Other: _____ 1 2 3 4 5
12. What motivates you to explore new teaching methods or tools?
   a) Improving student engagement 1 2 3 4 5
   b) Staying current with educational trends 1 2 3 4 5
   c) Professional growth and development 1 2 3 4 5
   d) Other: _____ 1 2 3 4 5
13. How important are the following aspects of gamification in motivating your students to learn?
   a) Immediate feedback 1 2 3 4 5
   b) Progressive challenges 1 2 3 4 5
   c) Rewards (e.g., badges, certificates) 1 2 3 4 5
   d) Storytelling or narrative 1 2 3 4 5
   e) Positive atmosphere in the classroom 1 2 3 4 5
   f) Collaboration with peers 1 2 3 4 5
14. Which forms of engagement do you believe are most important to foster?
   a) Affective (e.g., emotional connection, enthusiasm) 1 2 3 4 5
   b) Behavioral (e.g., participation, task completion) 1 2 3 4 5
   c) Cognitive (e.g., critical thinking, problem-solving) 1 2 3 4 5
15. What is most often enhanced through game-based teaching?
   a) Anxiety 1 2 3 4 5
   b) Boredom 1 2 3 4 5
   c) Enjoyment 1 2 3 4 5
   d) Flow 1 2 3 4 5
   e) Motivation 1 2 3 4 5
   f) Positive classroom atmosphere 1 2 3 4 5
   g) Engagement 1 2 3 4 5
   h) Interest 1 2 3 4 5
16. Do educational games enhance the effectiveness of learning? 1 2 3 4 5
17. Does game-based teaching enhance the effectiveness of learning? 1 2 3 4 5

APPENDIX 4

18. Do digital tools enhance the effectiveness of learning? 1 2 3 4 5
19. I prefer:
    a) to use pre-designed educational games 1 2 3 4 5
    b) create my own games tailored to my teaching needs 1 2 3 4 5
    c) to collaborate with the experts in the field (game developers) 1 2 3 4 5
20. I feel very confident in using
    a) Digital tools 1 2 3 4 5
    b) Gamification techniques 1 2 3 4 5
    c) Game-based teaching 1 2 3 4 5
21. What forms of support (if any) would you like to get
    a) Institutional support 1 2 3 4 5
    b) More hands-on experience 1 2 3 4 5
    c) Collaboration with experts in the field 1 2 3 4 5
22. What challenges do you foresee in teacher-developer collaborations?
    a) differing priorities 1 2 3 4 5
    b) problems in communication 1 2 3 4 5
    c) specific topics/knowledge needed for collaboration 1 2 3 4 5
    d) time constraints 1 2 3 4 5
23. What strategies could improve collaboration between teachers and game developers?
    a) regular workshops 1 2 3 4 5
    b) shared goals agenda 1 2 3 4 5
    c) co-creation platforms 1 2 3 4 5
    d) shared feedback mechanisms 1 2 3 4 5
24. What are your expectations of educational games related to their long-term relevance and sustainability?

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APPENDIX 4

18. Do digital tools enhance the effectiveness of learning? 1 2 3 4 5
19. I prefer:
    a) to use pre-designed educational games 1 2 3 4 5
    b) create my own games tailored to my teaching needs 1 2 3 4 5
    c) to collaborate with the experts in the field (game developers) 1 2 3 4 5
20. I feel very confident in using
    a) Digital tools 1 2 3 4 5
    b) Gamification techniques 1 2 3 4 5
    c) Game-based teaching 1 2 3 4 5
21. What forms of support (if any) would you like to get
    a) Institutional support 1 2 3 4 5
    b) More hands-on experience 1 2 3 4 5
    c) Collaboration with experts in the field 1 2 3 4 5
22. What challenges do you foresee in teacher-developer collaborations?
    a) differing priorities 1 2 3 4 5
    b) problems in communication 1 2 3 4 5
    c) specific topics/knowledge needed for collaboration 1 2 3 4 5
    d) time constraints 1 2 3 4 5
23. What strategies could improve collaboration between teachers and game developers?
    a) regular workshops 1 2 3 4 5
    b) shared goals agenda 1 2 3 4 5
    c) co-creation platforms 1 2 3 4 5
    d) shared feedback mechanisms 1 2 3 4 5
24. What are your expectations of educational games related to their long-term relevance and sustainability?

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APPENDIX 4

CODING SCHEME – QUESTIONNAIRE 1

DEMOGRAPHIC PROFILE - For questions 1 to 6 assign a numerical value to each of the identified categories, in the following manner:

Gender:

MALE	1
FEMALE	2
PREFER NOT TO SAY	3

Q 1: What is your primary role?

Primary or secondary school teacher	1
University lecturer	2
Teacher trainer	3
Other	Insert the response

Q 2: How many years of teaching experience do you have?

0-5	1
5-10	2
Over 10	3

Q3: What type of courses do you teach?

EFL	1
General pedagogy	2
Teacher preparation courses	3
other	4

Q4: In how many courses/workshops related to gamification or game-based teaching have you participated so far?

INSERT THE PROVIDED NUMBER

Q5: In how many courses/workshops related to using digital tools have you participated so far?

INSERT THE PROVIDED NUMBER

When coding the main questions, please make sure you code in an appropriate manner, so that answers are sorted by research questions.

The Excel Sheet helps you with that.

For Likert Scale Question, you need to provide a number indicated by the respondents, for open-ended questions, please copy the answer- you can summarize it, if possible.

QUESTIONS RELATED TO RQ 1, ARE THE FOLLOWING: **6, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18**

QUESTIONS RELATED TO RQ 2, ARE THE FOLLOWING: **4,5, 9, 10, 19, 20, 21**

APPENDIX 4

Questionnaire for University Teachers

GAME DEVELOPERS

Gender: Female ☐ Male ☐ Prefer not to say ☐ Non-binary/Another gender identity ☐

1. **What is your academic role?**
   a) Teaching game design
   b) Curriculum development for game design
   c) Other: _____
2. **What levels of education do you teach game design at?**
   a) Undergraduate
   b) Graduate
   c) Vocational/technical training
3. **How many years of experience do you have teaching game design?**
   a) 0–2 years
   b) 3–5 years
   c) 6–10 years
   d) Over 10 years

Mark all statements on a scale from 1- not at all to 5 -very much

4. **What areas of game design interest you most?**
   a) Game mechanics (rules, challenges) 1 2 3 4 5
   b) Game dynamics (motivation, collaboration, competition) 1 2 3 4 5
   c) Aesthetic design (visual storytelling, emotional engagement) 1 2 3 4 5
   d) User experience (UX) and accessibility 1 2 3 4 5
   e) Other: _____ 1 2 3 4 5
5. **What types of learning methods do you find most effective for game design?**
   a) Hands-on workshops and labs 1 2 3 4 5
   b) Group projects and collaboration 1 2 3 4 5
   c) Individual creative projects 1 2 3 4 5
   d) Lectures and theoretical instruction 1 2 3 4 5
6. **What forms of feedback do you get on your projects?**
   a) Peer feedback 1 2 3 4 5
   b) Instructor feedback 1 2 3 4 5
   c) Educator feedback 1 2 3 4 5
   d) User/playtester feedback 1 2 3 4 5
7. **How often do you need to consult your ideas with educators while designing a game?**
   a) Very often 1 2 3 4 5
   b) Only at the beginning of the project 1 2 3 4 5
   c) Only at the end of the project 1 2 3 4 5
   d) Other: _____ 1 2 3 4 5
8. **Collaboration with educators is essential when working on a new game** 1 2 3 4 5
9. **Feedback from the educators is essential when working on a new game** 1 2 3 4 5
10. **I am confident in teaching the principles of gamification and GBL to game design students** 1 2 3 4 5

APPENDIX 4

11. **How important is it for an educational game to be:**
    a) User-friendly 1 2 3 4 5
    b) Easily integrated into school system 1 2 3 4 5
    c) Compatible with existing technological infrastructures 1 2 3 4 5
    d) Functional 1 2 3 4 5
    e) Relevant 1 2 3 4 5
12. **What challenges do game developers face in ensuring their educational games are user-friendly?**
    a) Balancing educational content with engaging gameplay without overwhelming the user 1 2 3 4 5
    b) Creating intuitive interfaces that cater to diverse age groups and learning abilities. 1 2 3 4 5
    c) Ensuring games are accessible to users with disabilities, adhering to inclusive design principles. 1 2 3 4 5
    d) Providing immediate and constructive feedback to enhance learning without causing frustration. 1 2 3 4 5
    e) Implementing adaptive learning paths to accommodate individual learner differences. 1 2 3 4 5
13. **What challenges do game developers face in ensuring their educational games are easily integrated into the school system?**
    a) Ensuring game content aligns with educational standards and learning objectives. 1 2 3 4 5
    b) Providing adequate professional development for educators to effectively implement games in teaching. 1 2 3 4 5
    c) Developing mechanisms to assess and track student progress within the game environment. 1 2 3 4 5
    d) Addressing constraints related to time, budget, and infrastructure in schools 1 2 3 4 5
    e) Gaining buy-in from school administrators and policymakers for game-based learning initiatives. 1 2 3 4 5
14. **What challenges do game developers face in ensuring their educational games are compatible with existing technological infrastructures?**
    a) Designing games that function across various devices and operating systems used in schools. 1 2 3 4 5
    b) Considering varying levels of internet access, especially in under-resourced areas. 1 2 3 4 5
    c) Ensuring games run smoothly on the hardware available in educational settings. 1 2 3 4 5
    d) Complying with regulations to protect student data and privacy 1 2 3 4 5
    e) Providing ongoing technical assistance to address issues that may arise during game implementation. 1 2 3 4 5
15. **What skills or competencies do you think are most important for succeeding as a game designer in educational contexts?**
    a) Technical proficiency (e.g., programming, UX design) 1 2 3 4 5
    b) Creativity and innovation 1 2 3 4 5
    c) Communication skills 1 2 3 4 5
    d) Collaboration skills 1 2 3 4 5
    e) Knowledge of the subject matter (e.g., foreign language, maths, biology etc.) 1 2 3 4 5
    f) Pedagogical understanding (e.g., learning theories, instructional design) 1 2 3 4 5
16. **Extensive training is provided to educators using educational games.** 1 2 3 4 5
17. **Institutional support is provided to educators using educational games.** 1 2 3 4 5
18. **What challenges do you foresee in teacher-developer collaborations?**
    a) differing priorities 1 2 3 4 5
    b) problems in communication 1 2 3 4 5
    c) specific topics/knowledge needed for collaboration 1 2 3 4 5
    d) time constraints 1 2 3 4 5
19. **What strategies could improve collaboration between teachers and game developers?**
    a) regular workshops 1 2 3 4 5
    b) shared goals agenda 1 2 3 4 5

APPENDIX 4

c) co-creation platforms 1 2 3 4 5

d) shared feedback mechanisms 1 2 3 4 5

20. **What are the biggest challenges you face when aligning game design with educational content?**

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21. **How do you gather and incorporate feedback from educators regarding gaps in content, usability, and functionality?**

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22. **What strategies are in place to ensure the long-term relevance and sustainability of educational games?**

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APPENDIX 4

CODING SCHEME – QUESTIONNAIRE 2

DEMOGRAPHIC PROFILE - For questions 1 to 3 assign a numerical value to each of the identified categories, in the following manner:

Gender:

MALE	1
FEMALE	2
PREFER NOT TO SAY	3

1. **What is your academic role?**

TEACHING GAME DESIGN	1
CURRICULUM DESIGN FOR GAME DEVELOPMENT	2
OTHER	Insert the response

Q 2: What levels of education do you teach game design at?

undergraduate	1
graduate	2
vocational/teacher training	3

Q3: How many years of experience do you have teaching game design?

0-2	1
3-5	2
6-10	3
Over 10 years	4

When coding the main questions, please make sure you code in an appropriate manner, so that answers are sorted by research questions.

The Excel Sheet helps you with that.

For Likert Scale Question, you need to provide a number indicated by the respondents, for open-ended questions, please copy the answer- you can summarize it, if possible.

QUESTIONS RELATED TO RQ 1, ARE THE FOLLOWING: **4,5,10,11, 12, 13, 14, 15, 20**

QUESTIONS RELATED TO RQ 2, ARE THE FOLLOWING: **6, 7, 8, 9, 18, 19, 21**

QUESTIONS RELATED TO RQ 3, ARE THE FOLLOWING: **16, 17, 22**

APPENDIX 4

Questionnaire for Students

PEDAGOGY & TEACHER TRAINING

Gender: Female ☐ Male ☐ Prefer not to say ☐ Non-binary/Another gender identity ☐

1. **What is your area of study?**
   a) English language teaching
   b) General pedagogy
   c) Other: _____
2. **What is your current level of education?**
   a) Undergraduate
   b) Graduate
   c) Postgraduate
3. **How many years have you been studying teaching-related subjects?**
   a) 0–1 year
   b) 2–3 years
   c) Over 3 years
4. **In how many courses/workshops related to gamification or game-based teaching have you participated so far: ..**
5. **In how many courses/workshops related to using digital tools have you participated so far:**

.....

Mark all statements on a scale from 1- not at all to 5 -very much

6. **Which types of courses do you generally prefer?**
   a) Teacher-oriented (lectures, guided learning) 1 2 3 4 5
   b) Student-oriented (interactive, self-directed learning) 1 2 3 4 5
   c) Blended learning (mix of online and in-person components) 1 2 3 4 5
7. **How would you describe your ideal class structure?**
   a) Mostly lectures with teacher guidance 1 2 3 4 5
   b) Interactive workshops and discussions 1 2 3 4 5
   c) A mix of lectures, group work, and independent tasks 1 2 3 4 5
   d) Other: _____
8. **What format of materials do you prefer?**
   a) Physical handouts and textbooks 1 2 3 4 5
   b) Digital resources (e.g., PDFs, online platforms) 1 2 3 4 5
   c) Interactive content (e.g., quizzes, apps, games) 1 2 3 4 5
   d) Self-paced learning input 1 2 3 4 5
   e) Other: _____
9. **How familiar are you with the following concepts?**

a) Gamification (e.g., use of game mechanics like points, badges, leaderboards) 1 2 3 4 5
b) Game-based learning (e.g., using full games to teach concepts or skills) 1 2 3 4 5
c) Educational game design (e.g., designing a game to teach specific concepts or skills) 1 2 3 4 5

10. **How prepared do you feel to participate in:**

APPENDIX 4

a) Game-based learning 1 2 3 4 5
b) Gamification techniques 1 2 3 4 5
c) Educational game design activities 1 2 3 4 5

11. How important are the following aspects of gamification in motivating you to learn?

a) Immediate feedback 1 2 3 4 5
b) Progressive challenges 1 2 3 4 5
c) Rewards (e.g., badges, certificates) 1 2 3 4 5
d) Storytelling or narrative 1 2 3 4 5
e) Positive atmosphere in the classroom 1 2 3 4 5
f) Collaboration with peers 1 2 3 4 5

12. Which game components would you find most engaging in an educational context?

a) Points 1 2 3 4 5
b) Levels 1 2 3 4 5
c) Badges 1 2 3 4 5
d) Leaderboards 1 2 3 4 5
e) Virtual rewards 1 2 3 4 5
f) Challenges 1 2 3 4 5
g) Other 1 2 3 4 5

13. Which forms of engagement do you believe are most important to foster?

a) Affective (e.g., emotional connection, enthusiasm) 1 2 3 4 5
b) Behavioral (e.g., participation, task completion) 1 2 3 4 5
c) Cognitive (e.g., critical thinking, problem-solving) 1 2 3 4 5

14. What types of activities engage you the most?

a) Storytelling or role-playing games 1 2 3 4 5
b) Solving real-world problems 1 2 3 4 5
c) Collaborative group tasks and games 1 2 3 4 5
d) Individual tasks and games 1 2 3 4 5
e) Competitive games with scores or leaderboards 1 2 3 4 5
f) Other: _____ 1 2 3 4 5

15. What forms of learning in a game-based environment do you prefer?

a) Individual learning 1 2 3 4 5
b) Collaborative learning 1 2 3 4 5

16. How important is peer interaction in your learning process? 1 2 3 4 5

17. Do educational games enhance collaborative learning? 1 2 3 4 5

18. What types of emotions could be enhanced through game-based teaching?

a) Anxiety 1 2 3 4 5
b) Boredom 1 2 3 4 5
c) Enjoyment 1 2 3 4 5
d) Flow 1 2 3 4 5

19. What could be enhanced while using game-based teaching?

a) Motivation 1 2 3 4 5
b) Positive classroom atmosphere 1 2 3 4 5
c) Engagement 1 2 3 4 5

APPENDIX 4

d) Interest 1 2 3 4 5

20. I feel very confident in using

a) Digital tools 1 2 3 4 5
b) Gamification techniques 1 2 3 4 5
c) Game-based teaching 1 2 3 4 5

21. What forms of support (if any) would you like to get

a) Institutional support 1 2 3 4 5
b) More hands-on experience 1 2 3 4 5
c) Collaboration with experts in the field 1 2 3 4 5

22. Do educational games enhance the effectiveness of learning? 1 2 3 4 5

23. Does game-based teaching enhance the effectiveness of learning? 1 2 3 4 5

24. Do digital tools enhance the effectiveness of learning? 1 2 3 4 5

25. What are your expectations of educational games in terms of content and engagement?

a) Educational games should be aligned with the content of my studies. 1 2 3 4 5
b) Educational games should provide engaging and enjoyable learning experiences. 1 2 3 4 5
c) Educational games should include real-world teaching scenarios. 1 2 3 4 5
d) Educational games should encourage active participation and interactivity. 1 2 3 4 5
e) Educational games should deliver structured and relevant content. 1 2 3 4 5
f) Educational games should adapt to different learning styles. 1 2 3 4 5
g) Educational games should balance educational value and entertainment. 1 2 3 4 5
h) Educational games should promote critical thinking and problem-solving. 1 2 3 4 5
i) Educational games should include collaborative features, such as teamwork. 1 2 3 4 5
j) Educational games should provide immediate feedback and progress tracking. 1 2 3 4 5

APPENDIX 4

CODING SCHEME – QUESTIONNAIRE 3

DEMOGRAPHIC PROFILE - For questions 1 to 3 assign a numerical value to each of the identified categories, in the following manner:

Gender:

MALE	1
FEMALE	2
PREFER NOT TO SAY	3

1. **What is your area of study?**

ENGLISH LANGUAGE TEACHING	1
GENERAL PEDAGOGY	2
OTHER	Insert the response

Q 2: What is your current level of education?

undergraduate	1
graduate	2
postgraduate	3

Q3: How many years have you been studying teaching-related subjects?

0-1	1
2-3	2
Over 3 years	3

When coding the main questions, please make sure you code in an appropriate manner, so that answers are sorted by research questions.

The Excel Sheet helps you with that.

For Likert Scale Question, you need to provide a number indicated by the respondents, for open-ended questions, please copy the answer- you can summarize it, if possible.

QUESTIONS RELATED TO RQ 1, ARE THE FOLLOWING: **6, 7, 8, 10, 25**

QUESTIONS RELATED TO RQ 2, ARE THE FOLLOWING: **4, 5, 9, 11, 12, 13, 14**

QUESTIONS RELATED TO RQ 3, ARE THE FOLLOWING: **20, 21**

QUESTIONS RELATED TO RQ 4, ARE THE FOLLOWING: **15, 16, 17**

QUESTIONS RELATED TO RQ 5, ARE THE FOLLOWING: **18, 19, 22, 23, 24**

APPENDIX 4

Questionnaire for Students

GAME DEVELOPMENT

Gender: Female ☐ Male ☐ Prefer not to say ☐ Non-binary/Another gender identity ☐

1. **What level of education are you pursuing?**
   a) Undergraduate
   b) Graduate
   c) Vocational/technical training
2. **How many years have you been studying game design?**
   a) 0–1 year
   b) 2–3 years
   c) Over 3 years
3. **In how many courses/workshops related to gamification or game-based teaching have you participated so far?**

   ...
4. **In how many courses/workshops related to using digital tools have you participated so far?: ...**
   Mark all statements on a scale from 1- not at all to 5 -very much
5. **What areas of game design interest you most?**
   a) Game mechanics (rules, challenges) 1 2 3 4 5
   b) Game dynamics (motivation, collaboration, competition) 1 2 3 4 5
   c) Aesthetic design (visual storytelling, emotional engagement) 1 2 3 4 5
   d) User experience (UX) and accessibility 1 2 3 4 5
   e) Other: _____ 1 2 3 4 5
6. **What types of learning methods do you find most effective for game design?**
   a) Hands-on workshops and labs 1 2 3 4 5
   b) Group projects and collaboration 1 2 3 4 5
   c) Individual creative projects 1 2 3 4 5
   d) Lectures and theoretical instruction 1 2 3 4 5
7. **How do you prefer to receive feedback on your projects?**
   a) Peer feedback 1 2 3 4 5
   b) Instructor feedback 1 2 3 4 5
   c) User/playtester feedback 1 2 3 4 5
8. **What tools or platforms do you use for game design projects?**
   a) Game engines (e.g., Unity, Unreal Engine) 1 2 3 4 5
   b) Prototyping tools (e.g., Figma, Adobe XD) 1 2 3 4 5
   c) Collaboration platforms (e.g., Trello, Slack) 1 2 3 4 5
   d) Other: _____ 1 2 3 4 5
9. **What format of materials do you prefer?**
   a) Physical handouts and textbooks 1 2 3 4 5
   b) Digital resources (e.g., PDFs, online platforms) 1 2 3 4 5
   c) Interactive content (e.g., quizzes, apps, games) 1 2 3 4 5
   d) Self-paced learning input 1 2 3 4 5
   e) Other: _____ 1 2 3 4 5
10. **How familiar are you with the following concepts?**

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a) Gamification (e.g., use of game mechanics like points, badges, leaderboards) 1 2 3 4 5
b) Game-based learning (e.g., using full games to teach concepts or skills) 1 2 3 4 5
c) Educational game design (e.g., designing a game to teach specific concepts or skills) 1 2 3 4 5

11. How prepared do you feel to design:

c) Game-based learning 1 2 3 4 5
c) Gamification techniques 1 2 3 4 5
c) Educational game design activities 1 2 3 4 5

12. How important are the following aspects of gamification in motivating students to learn?

a) Immediate feedback 1 2 3 4 5
b) Progressive challenges 1 2 3 4 5
c) Rewards (e.g., badges, certificates) 1 2 3 4 5
d) Storytelling or narrative 1 2 3 4 5
e) Positive atmosphere in the classroom 1 2 3 4 5
f) Collaboration with peers 1 2 3 4 5

13. Which game components would you find most engaging in an educational context?

a) Points 1 2 3 4 5
b) Levels 1 2 3 4 5
c) Badges 1 2 3 4 5
d) Leaderboards 1 2 3 4 5
e) Virtual rewards 1 2 3 4 5
f) Challenges 1 2 3 4 5
g) Other 1 2 3 4 5

14. Which forms of engagement do you believe are most important to foster?

c) Affective (e.g., emotional connection, enthusiasm) 1 2 3 4 5
c) Behavioral (e.g., participation, task completion) 1 2 3 4 5
c) Cognitive (e.g., critical thinking, problem-solving) 1 2 3 4 5

15. What types of activities are the most engaging?

f) Storytelling or role-playing games 1 2 3 4 5
f) Solving real-world problems 1 2 3 4 5
f) Collaborative group tasks and games 1 2 3 4 5
f) Individual tasks and games 1 2 3 4 5
f) Competitive games with scores or leaderboards 1 2 3 4 5
f) Other: _____ 1 2 3 4 5

16. What forms of learning in a game-based environment do you prefer?

b) Individual learning 1 2 3 4 5
b) Collaborative learning 1 2 3 4 5

17. How important is peer interaction in your learning process? 1 2 3 4 5

18. Do educational games enhance collaborative learning? 1 2 3 4 5

19. What is the ultimate outcome of education game design and game-based teaching

d) Enhanced motivation 1 2 3 4 5
d) Positive classroom atmosphere 1 2 3 4 5
d) Enhanced engagement 1 2 3 4 5
d) Enhanced interest 1 2 3 4 5

20. I feel very confident in using

c) Digital tools 1 2 3 4 5
c) Gamification techniques 1 2 3 4 5
c) Game-based teaching 1 2 3 4 5

APPENDIX 4

CODING SCHEME – QUESTIONNAIRE 4

DEMOGRAPHIC PROFILE - For questions 1 to 3 assign a numerical value to each of the identified categories, in the following manner:

Gender:

MALE	1
FEMALE	2
PREFER NOT TO SAY	3

Q 1: What level of education are you pursuing?

undergraduate	1
graduate	2
vocational/teacher training	3

Q2: How many years have you been studying game design?

0-1	1
2-3	2
Over 3 years	3

When coding the main questions, please make sure you code in an appropriate manner, so that answers are sorted by research questions.

The Excel Sheet helps you with that.

For Likert Scale Question, you need to provide a number indicated by the respondents, for open-ended questions, please copy the answer- you can summarize it, if possible.

QUESTIONS RELATED TO RQ 1, ARE THE FOLLOWING: **5, 6, 7, 8, 9**

QUESTIONS RELATED TO RQ 2, ARE THE FOLLOWING: **3, 4, 10, 12, 13, 14, 15, 19**

QUESTIONS RELATED TO RQ 3, ARE THE FOLLOWING: **11, 20, 21**

QUESTIONS RELATED TO RQ 4, ARE THE FOLLOWING: **16, 17, 18**

QUESTIONS RELATED TO RQ 5, ARE THE FOLLOWING: **22, 23**