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STEAME ACADEMY
TEACHING FACILITATION LEARNING & CREATIVITY PLAN (L&C PLAN) - LEVEL 2
SERVICE TEACHERS: ON A QUEST TO CREATE A GAMIFIED STUDY GUIDE

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1. Overview

Title	**On a Quest to Create a Gamified Study Guide**		
Driving Question or Topic	How can we create an engaging gamified study guide using GameMaker? How can we study in an easier manner? How can we combine games with studying and school?		
Ages, Grades, …	**Ages 14-19**	**Grades 9-12**	
Duration, Timeline, Activities	Number of learning hours: 9-10 h.	Timeline/frame, calendar: 15 x 40 min	Number of activities 5
Curriculum Alignment	Science, IT, Entrepreneurship, Arts, Innovative subjects: *Human & the Living Environment*		
Contributors, Partners Abstract - Synopsis	Game development experts, local tech companies, university students Students will learn to create a gamified study guide using GameMaker software. They will explore game design principles, develop content for the study guide, and create a basic game prototype. The project aims to enhance understanding of educational content through interactive and engaging methods.		
References, Acknowledgements	https://gamemaker.io/		

2. STEAME ACADEMY Framework*

Teachers' Cooperation	**Teacher 1 – T1** (Computer Science/IT): Introduce GameMaker software and game design principles. **Teacher 2 – T2** (Arts): Assist with the creative aspects of game design, including graphics and user interface. **Teacher 3 – T3** (Science): Guide the integration of educational content into the game. **Teacher 4 – T4** (Entrepreneurship): How to market the game and make subscription-based profit. **Teacher 5 – T5 (Literature):**

	Explain what adds to the atmosphere in a story. Basic storytelling principles.
STEAME in Life (SiL) Organization	Engage local game development experts for guest lectures and mentorship. Organize a visit to a local tech company or a virtual meeting with game developers.
Action Plan Formulation	**Stage I: Preparation by Teachers:** • Introduce the project and its goals: Explain the concept of gamified study guides and how they can enhance learning. • Provide an overview of GameMaker software and its capabilities: Conduct a demonstration of GameMaker, highlighting its features and potential for creating educational games. **Stage II: Development by Students** • Explore game design principles and educational content integration: Discuss elements such as storytelling, user engagement, educational objectives, and how to integrate them into a game. • Develop the storyline and content for the gamified study guide: Students brainstorm and outline the educational content they want to include (from the Science field – could be Biology, Physics, Chemistry, Geography, History, etc). They decide on the game's storyline, characters, and objectives. • Create a basic game prototype using GameMaker: Students start building their game, incorporating educational content and game design principles. They create levels, challenges, and interactive elements that align with their study guide. • Market the game to an appropriate audience: Students choose their target group (students from specific types of schools/students in general/students in a certain age, based on the game content). They create videos on social media platforms and think of ways to advertise their game. **Stage III: Configuration & Results** • Test the game prototype and gather feedback: Students playtest each other's games, providing constructive feedback on usability, engagement, and educational value. • Present the gamified study guide to the class: Each group presents their game, explaining their design choices and how the game supports learning. • Discuss potential improvements and future developments: Reflect on the feedback and discuss ways to enhance the game further. Consider additional features or content that could be added.

[*] *under development the final elements of the framework*

3. Objectives and Methodologies

Learning Goals and Objectives	• Understand game design principles and educational content integration. • Understand and apply the knowledge from the respective Science field, incorporated into the game. • Generate new ideas. • Develop technical skills using GameMaker software. • Enhance creativity, problem-solving, and collaboration skills.

	• Present the results.
Learning Outcomes and expected Results	• To **apply** basic game design and game development. • To **understand** how a game works. • To **create** a game prototype "from scratch" using GameMaker. • To **analyze** scientific information and be able to incorporate it in a game. • To **assess** oneself and other teams. • To **relate** Science, Technology and Arts to real life. • To **identify** correct target groups and advertisements.
Prior Knowledge and Prerequisites	• Basic understanding of programming concepts. • Advanced understanding of certain educational content (chosen by the student). • Research skills.
Motivation, Methodology, Strategies, Scaffolds	All the learning activities are student-centered and are based on students' motivation to play videogames, rather than study. This sets the tone for: • Project-based learning with hands-on activities. • Collaboration with external stakeholders for real-world insights. • Encouraging creative thinking and innovation through gamification. The activities will not only show students how to create their own games and advertise them but will also help them understand scientific concepts better (According to research, "students who self-explain (by imagining that they explain to someone else) comfortably met or even exceeded performance expectations for their age", which can be achieved through explaining by inlaying the content into the game.

4. Preparation and Means

Preparation, Space Setting, *Troubleshooting Tips*	• Classroom setup for group work. • Computer access. • Access to GameMaker software and YouTube tutorials.
Resources, Tools, Material, Attachments, Equipment	• Computers with GameMaker installed. • Tutorials and guides for GameMaker. • Art supplies for designing game graphics (optional). • Projector or screen for demonstrations and presentations.
Health and Safety	Spending too much time in front of a screen might lead to nervous system issues and vision problems. Using a computer needs to be in moderation.

5. Implementation

Instructional Activities, Procedures, Reflections	**Lesson 1: Introduction to GameMaker and game design principles** Duration: 40 minutes Activities: • Introduction to the project and its objectives. • Overview and demonstration of GameMaker software. • Introduction to basic game design principles (e.g., storytelling, engagement, educational integration). • Discussion on the educational content to be included in the game.

	Lesson 2: Development of the gamified study guide content and storyline Duration: 4x40 minutes Activities: • Literature teacher explains storytelling basics better. • Students brainstorm and outline the educational content and storyline. • Discussion and selection of game elements (characters, levels, challenges). • Begin creating the game prototype in GameMaker. • Teachers provide guidance and support throughout the development process. **Lesson 3: Creation and testing of the game prototype** Duration: 8x40 minutes *(+ optional work at home)* Activities: • Students continue working on their game prototypes. • Conduct peer playtesting sessions to gather feedback. **Lesson 4: Final Presentation** Duration: 2x40 minutes Activities: • Present the gamified study guide (with live demonstrations) to the class as well as ideas for its potential marketing campaign. • Reflect on feedback and discuss potential improvements.
Assessment - Evaluation	• Ongoing feedback during the development process, focusing on creativity, problem-solving, and technical skills. • Final evaluation of the game prototype based on functionality, educational effectiveness, and engagement. • Peer and Self-Evaluation: Students evaluate their own and peers' contributions and learning experiences.
Presentation - Reporting - Sharing	• Class Presentations: Students present their gamified study guides using live demonstrations. • Digital Presentations: Share the game development process and final product through digital presentations or videos. • Showcase Event: Organize an event to showcase the games to other students, teachers, and possibly parents.
Extensions - Other Information	• Advanced Game Development: Explore more advanced game development techniques and features in extracurricular activities. • Competitions and Hackathons: Encourage participation in local or online game development competitions to further develop skills and gain recognition. • Collaboration Opportunities: Foster partnerships with local tech companies or educational institutions for future projects and mentorship.