DESIGN THINKING ACTIVITY PLAN TEMPLATE YEAR 2

1. BASIC INFORMATION

PROJECT TITLE:

Title of the Design Thinking (DT) Project

AUTHOR(S):

Name(s) of teacher (s), designer(s), researcher(s) who created the Activity Plan

ISSUE:

Briefly Describe the **problem** or the **topic** that this DT project seeks to solve in 1-2 sentences.

E.g. Metal mining for jewellery production purposes has a hugely detrimental impact on the planet. In times critical for environmental sustainability, it is important for the industry to develop more sustainable methods for jewellery production.

FINAL STUDENT PRODUCTION:

What is the expected final artifact that will be produced by the students using emerging technologies throughout the DT project?

e.g.1 a 3D model of a jewel

e.g.2 a GIS simulation game for sustainable transportation in the city

TECHNOLOGIES TO BE USED:

Select the ExtenDT2 technologies that will be used by students during the DT Project

☐ MaLT2 ☐ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire

2. FOCUS, SET UP & REQUIREMENTS OF THE ACTIVITY

2.1 LEARNING OUTCOMES

You can find the Learning objectives Verbs here

Domain Related	
e.g. 1 Mathematics	*e.g.1 **Use** the mathematical properties of the 3D shapes to design the digital jewel model (Mathematics)*
e.g. 2 Chemistry	*e.g. 2 **Decide** on the material for printing the 3D model (Chemistry)*
Design Thinking & innovation with Emerging Technologies Related	
e.g. 3 Prototyping	*e.g. 3 **Create** different prototypes of 3D models (MaLT2 & 3D printing)*
e.g. 4 Analysis	*e.g. 4 **Interpret** questionnaires answers to design criteria for the model they create.*
e.g 5 Reflecting & Feedback	*e.g. 5 **Relate** the feedback from their peers to iterations they did to the prototype*
21st century Skills Related	

e.g 6 Communication	e.g. 6 **Explain** their ideas to others.
	e.g. 7 ***Discuss*** *different solutions to the issue at hand.*
e.g 7 Presentation	*e.g.8* ***Present*** *their final artifact by demonstration*

2.2 PARTICIPANTS & CONTEXT

STUDENTS

Age	*10-11 years old*
Prior knowledge	*basic knowledge of programming concepts with Logo*
Nationality, gender, cultural background	*1 pupil is from Albania and 21 from Greece, 15 boys & 7 girls*
Language	*Greek*
Special needs and abilities	-

TIME

ACTIVITY DURATION: *e.g. 8 hours divided into 4 times* ***(min 8 hours - 2 sessions)***

IMPLEMENTATION DURATION: *e.g. 4 weeks*

SCHEDULE*: e.g. 2 hours/week*

SPACE

Specify where the activity will take place

ACTIVITY TYPE: ☐ In-person ☐ At distance ☐ Mixed

PHYSICAL SPACE: *e.g. computer laboratory, classroom*

VIRTUAL SPACE: *e.g. moodle platform, Miro Platform MS-TEAMS platform, E-class*

2.3 SOCIAL ORCHESTRATION

PEOPLE INVOLVED

No of STUDENTS: No of GROUPS : No of TUTORS: No of ASSISTANTS:

STUDENT GROUPING & INTERACTIONS

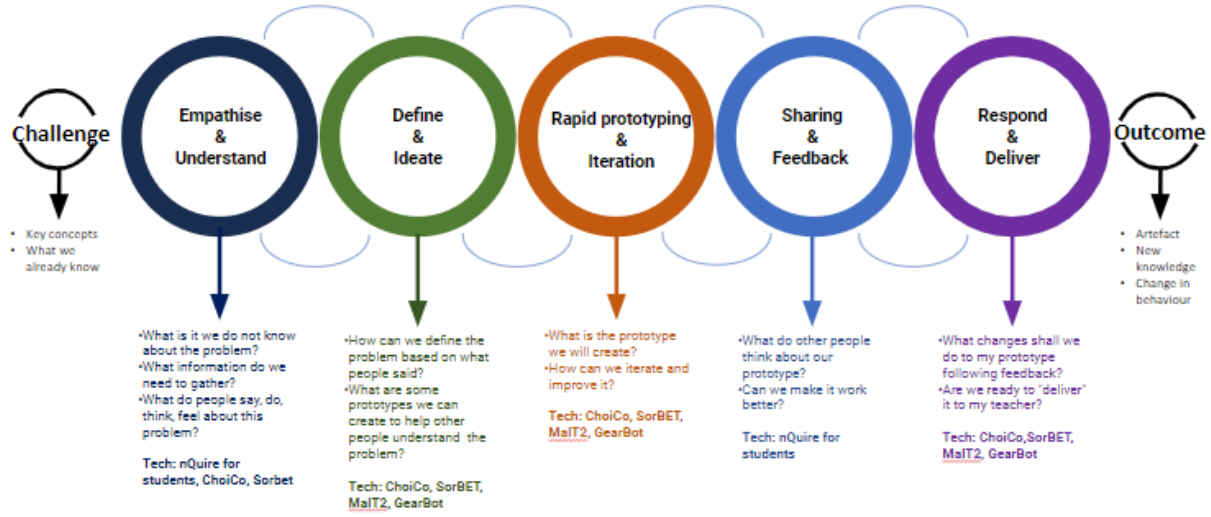
Grouping Criteria	*e.g. mixed school performance, student preferences*
Organisation	*e.g. 3 students per group using 1 computer per group* ***(min 2, max 5 students/group)***
Roles in the group	*e.g. pre-defined roles; emergent roles; role exchange in the group (in case the roles are predefined by the teacher, provide more details about what each role is expected to be responsible for)*
Tutor(s) role(s)	*e.g. intervene; monitor; facilitate; guide; observe*

2.4 TEACHING RESOURCES

Digital resources	*e.g. MaLT2 microworld with basic 2D & 3D models created by the teacher (a pyramid, a cube, a circle)*
Physical resources	*e.g. a 3D printed model, workbook*

3. IMPLEMENTATION - DESIGN THINKING ACTIVITY FLOW

This section describes how the teaching and learning process is expected to evolve through the 5 phases of the Design Thinking Methodology: 1. Empathise & Understand, 2. Define & Ideate, 3. Rapid prototyping & Iteration, 4. Sharing & Feedback, 5. Respond & Deliver. The described activities should support the objectives stated and make use of the technologies, supporting material, and teaching and learning processes mentioned earlier in the activity plan.



PHASE 0: CHALLENGE

Give a short description of the challenge the project addresses.

- ➔ *What is the problem or issue they would like to explore?*
- ➔ *What are the related key concepts?*
- ➔ *What do the students already know about it?*
- ➔ *What information do they need to gather?*

PHASE 1: EMPATHIZE & UNDERSTAND

In the "Empathise & Understand" phase students explore (diverge) and understand the problem of their Design Thinking project for which they will develop a final artifact. This involves a) exploring various aspects of the problem and developing an understanding of the issue at hand and b) empathize with their potential audience, creating online surveys in nQuire asking questions to discover their needs. When you design the activity think about how you are going to support your students:

- ➔ *Which are the people involved?*
- ➔ *What do they say, do, think, feel about this problem?*

DURATION: *e.g., 2 hours*

 *Take into account that activities like creating a questionnaire using NQuire require your students to become familiar with the tool.*

 *Take some time to present the NQuire functionalities to your students (e.g. show them an existing 'mission'.) Ask them to think of the questions they will ask first and then create their 'mission'. To save time, each group can distribute their mission to their classmates or school teachers during a recess (e.g. using tablets).*

DESCRIPTION OF THE ACTIVITIES:

e.g. In this phase students first discuss the issue with the teacher and explore the videos provided. Then they decide on questions they want to ask their audience and create an online questionnaire with NQuire. Following they share the questionnaire with their audience y sending the link of the mission via mail and collect the answers. They discuss the results with their group and discuss interesting findings that may be useful for developing a concept for the game they will develop.

EXPECTED USE OF EXTENDT2 TECHNOLOGY:

☐ MaLT2 ☐ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire ☐ No technology

STUDENTS' CONSTRUCTIONS: *e.g Online questionnaire*

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	*e.g. discussion and argumentation on what questions need to be included in the questionnaire*
Between the groups	*e.g. Different groups do not interact during this phase*

PHASE 2: DEFINE & IDEATE

In the "Define & Ideate" phase, students think of possible solutions based on the information gathered in phase 1 aiming to define (narrow down / converge) certain features of the artifact they will create. s. This involves, for example, deciding on an initial first structure, setting criteria and deciding on specific featurese.g. define the main gaming idea and the basic game elements in ChoiCo and SorBET, or define the material and type of their 3D model in MaLT2. When you design the activity think about how you are going to support your students:

a) ***Define*** *the problem to be solved:*
   - ➔ *How can I define the problem based on what people said?*

b) ***Ideate****:*
   - ➔ *What are some possible solutions to the problem?*

DURATION: *e.g. 2 hours*

 *Students need some time to see and analyze the data from the questionnaires of phase 1. You can do this in the classroom as a whole or ask them to do it at home*

Keep in mind that children may need support with divergent thinking. Remind them that the aim of the activity is not to find THE answer but to think of lots of possible solutions and THEN gain consensus on which one they will develop a prototype for.

DESCRIPTION OF THE ACTIVITIES:

Do your students use the conclusions from the data they gathered during the previous phase in developing their project's criteria? Discuss with them how the criteria they set for their project relate to the data gathered during the previous phase.

EXPECTED USE OF EXTENDT2 TECHNOLOGY: *e.g. Experiment with the existing procedures in MaLT2 and select the ones they need to compose a 3D jewelry model.*

STUDENT CONSTRUCTIONS:

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	
Between the groups	

PHASE 3: RAPID PROTOTYPING & ITERATION

In the "Rapid prototyping & Iteration" phase students are encouraged to give different answers (diverge again) to the initial problem by designing in their group a range of prototypes for their artifact, testing them internally in their group and redesigning them until a final version is ready. This involves, for example, creating low-fidelity game prototypes, testing them in the group and keep refining them. The EXTENDT2 tools allow for rapid prototyping and testing as they support quick transition between play & design modes (ChoiCo & SorBET), dynamic manipulation of the model (MaLT2) and instant testing of the solution (virtual robotics). They also support saving the prototypes in order for the students to keep versions of their work. Discuss with your students:

- ➔ *What are the prototypes they will create?*
- ➔ *How can they iterate and improve their prototypes?*

DURATION: *e.g., 3 hours*

Take into account the time your students need to learn how to use the tool. Would a half-baked artifact, a presentation or a tutorial that guides them to make changes be helpful for the students to get to know the tool's functionalities? Find free online supporting material for the tools here

Remind students to test their digital artifacts during this phase.

Encourage students to reflect on what they learned from the empathizing activities and their defining activities. To think about what the next steps are, what is missing, what could be improved etc.

DESCRIPTION OF THE ACTIVITIES:

 *How can you prompt students to test and iterate their prototype?*

 *Provide to your students with materials or guidelines to track their work during this phase. For example you can provide them with a checklist where they can note how many prototypes have been created so far.*

 *Remind your students to save versions of their work regularly.*

 *Ask them about changes they made and the reasons they made them.*

EXPECTED USE OF EXTENDT2 TECHNOLOGY:

☐ MaLT2 ☐ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire ☐ No technology

STUDENT CONSTRUCTIONS: e.g. MaLT2 3D models

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	
Between the groups	

PHASE 4: SHARING & FEEDBACK

In the "Sharing & Feedback" phase students focus on (converge) their final solution and its delivery to the target audience and the public. This involves sharing it and testing it with people outside their group (e.g. other groups, classmates, teachers, etc). In this stage they can use ExtenDT2 technologies, e.g. nQuire, to create online surveys sharing their final product with the target audience (e.g. other students, teachers, parents) and asking them to evaluate it, giving them feedback. Encourage your students to think:

- ➔ *How will they know what other people think about their prototype?*
- ➔ *Can they make it work better?*

DURATION: *e.g., 1 hour*

 *Structure the activity in order for the students to have time to experiment with others' prototypes as well as give feedback.*

DESCRIPTION OF THE ACTIVITIES:

 *Think whether your students have been engaged in giving feedback before. If not, consider providing them hints and keywords that could support them in providing constructivist feedback that can be useful for others. You can give each group a feedback worksheet to fill in while testing others' artifacts.*

EXPECTED USE OF EXTENDT2 TECHNOLOGY:

☐ MaLT2 ☐ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire ☐ No technology

STUDENT CONSTRUCTIONS:

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	*e.g. Discussion, Negotiation of what questions need to be included in the questionnaire*
Between the groups	*e.g. Different groups do not interact during this phase*

PHASE 5:RESPOND & DELIVER

In the "Respond & Deliver" phase, students present and demonstrate the final product to potential users, , discussing possible refinements as an afterlife plan for the project according to the feedback given in the previous phase. In this phase, students can deliver their final solution through a class/school presentation, a pitch video/poster, or through a public mission in the NQuire platform . Encourage your students to think about and discuss:

- ➔ *Which parts of the feedback given by others during the previous phase are technically feasible and which are not?*
- ➔ *How does the feedback relate to the original ambition of the project that students defined?*
- ➔ *What have students learned from the feedback activity?*
- ➔ *What changes will they make to their prototype following the feedback and why?*

DURATION: *e.g., 1 hour*

DESCRIPTION OF THE ACTIVITIES

Do students take into account the feedback given to refine their artifact?

Ask them how they would refine their prototype according to the feedback they got during the previous phase. If they don't have time for making improvements ask them to note them down (e.g. write down 4-5 changes you would make based on the feedback) or fill in Use a spreadsheet. for them to fill in if necessary.

EXPECTED USE OF EXTENDT2 TECHNOLOGY:

☐ MaLT2 ☐ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire ☐ No technology

STUDENT CONSTRUCTIONS:

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	*e.g. Discussion, Negotiation of what questions need to be included in the questionnaire*
Between the groups	*e.g. Different groups do not interact during this phase*

4. STUDENT ASSESSMENT AND FEEDBACK

What methods and tools will you use to facilitate the assessment of the learning outcomes stated at section 3.1. (e.g., post-activity tests, reflective videos, student worksheets, etc.).

TOOLS

Describe the assessment tools that will be used

e.g. student evaluation sheet, tutor's notes with a template for evaluating student activity, student worksheet, test

APPROACH

Describe the formative and summative assessment activities. How these assess the achievement of the learning objectives as described in section 2.1.

Learning Outcome	Assessment Activity
e.g. ***Use*** *the mathematical properties of the 3D shapes to design the digital jewel model (Mathematics)*	*e.g. Review of the students' programs in their final artifacts* *e.g. Worksheets review*