Deliverable Report

Extending Design Thinking with Emerging Digital Technologies

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(Integration of emerging new technologies into education and training)

Deliverable 6.3

The OpenLearn Create Online Course

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Abbreviations

Exten.(D.T.)²	Extended squared
OU	The Open University
WP	Work Package
DT	Design Thinking
ChoiCo	Choices with Consequences
MaLT2	Machine Lab Turtleworlds 2
SorBET	Sorting Based on Educational Technology
AR	Augmented Reality

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1. Summary

This deliverable reports on the development of an OU OpenLearn Create free online course for teachers and interested stakeholders (e.g., informal learning organisations, teacher trainers) to access during and after the Exten.(D.T.)^2 project ends. This free online course introduces the project's design thinking (DT) approach, the Digital Design Thinking model, project technologies, and the DT activity plan. The OpenLearn Create course provides a certificate of participation and a badge to all enrolled participants provided that they secure a score of 80% and above at the end of the course quiz. During the project period, at least 500 teachers and/or teacher trainers are expected to join this course.

2. OpenLearn Create Course

The online course is entitled *Teaching design thinking with digital technologies* (Figure 1) and is aimed at teachers or tutors at any level of education including primary, secondary, further and higher education and other interested educational stakeholders. This is a participant-regulated course as tutors do not require to facilitate it. This course focuses on helping the participants understand what DT is and how it can be used with the support of a suite of digital technologies, which can enable easy and effective implementation of DT with emerging technologies in both a physical and an online setting. The course requires 12 hours of study. Since November 2024 the course has been in pilot mode: www.open.edu/openlearncreate/ExtenDT2 .

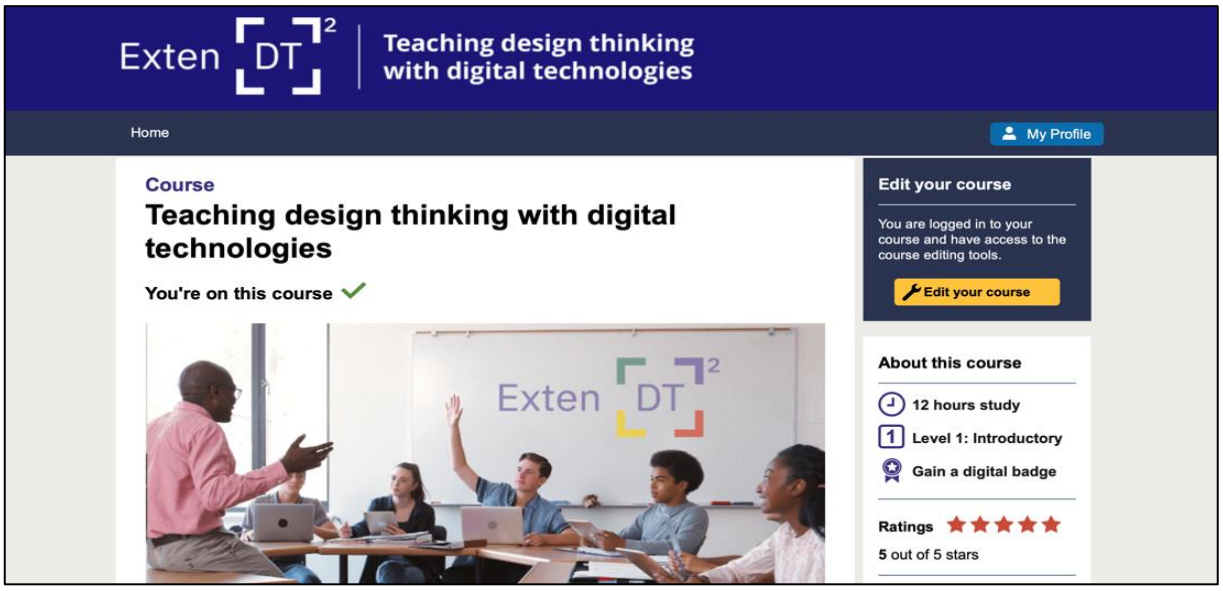


Figure 1. A screenshot of the OpenLearn Create Course

The project team is working on amendments following feedback collected from four participants who tested the course. The course will be fully launched in March 2025.

2.1 Learning Objectives

The **Learning objectives** of the course are:

Upon the completion of the course, the participants are expected to:

- Explain to their students what DT is and why the Exten.(D.T.)² Digital Design Thinking Model can help provide solutions to challenges they face in school, work, or life.
- Demonstrate the added value of using digital technologies for DT activities.
- Experiment with digital technologies and reflect on which ones to use in DT projects.
- Use DT projects to help students identify and solve real-world problems they find relevant and meaningful.
- Develop an activity plan the participants can implement with their students next time they teach.

2.2 Course Structure

The course is broadly structured into three components viz., introduction to DT, digital technologies for DT and developing an activity plan to implement DT activity. The course begins with the course learning outcomes, key terminologies used in the course and ways of accessing the Exten(DT)² platform (https://extendt2.com). The Exten(DT)² platform is a secured gateway for learners to access project's technologies and save the artefacts they develop using these technologies.

The course introduces and discusses what DT is, why it is important, how it differs from the problem-based learning (PBL) approach. It also introduces the Exten.(D.T.)² Digital Design Thinking model (see Figure 2), which guides teachers through a DT project example and demonstrates how Exten.(D.T.)² technologies can be used to support the DT process and projects (see Figure 3).

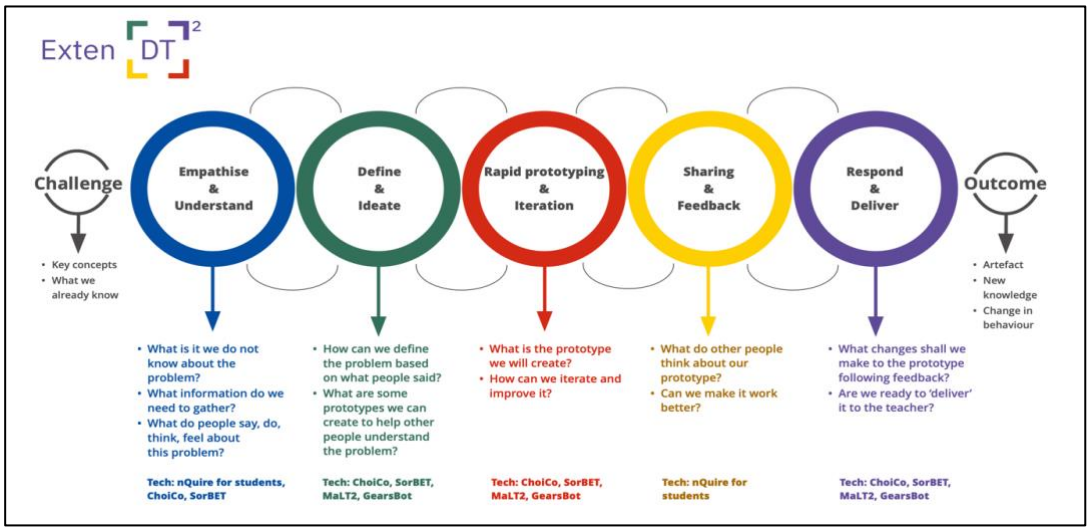


Figure 2. Exten.(D.T.)² Digital Design Thinking model

2 Using technology for design thinking

In design thinking activities for classroom environments, digital technologies can help both pupils and teachers carry out actions at different stages of the design thinking process.

Some technologies can speed up design thinking processes and help achieve tangible outputs. Creating and distributing an online form to users to understand needs and feelings at the 'empathise' stage of design thinking is a good example of this. In this case, the application that helps create the online form speeds up the process by enabling design thinking activity to reach several members at once, irrespective of temporal and spatial barriers.

This section introduces you to a number of popular design thinking models then focuses on the Exten(DT)² Digital Design Thinking Model, which has been designed to help teachers prepare and teach design thinking to students. You will also cover how emerging technologies can assist both teachers and students at different stages of design thinking activity.

Figure 3. A screenshot of the section "Using technology for design thinking"

An example starts from identification of a challenge to be addressed by the students. Then, the course demonstrates available Exten.(D.T.)^2 technologies (see Figure 3) and how they can be used to support different DT phases illustrated in Figure 2. The Exten.(D.T.)^2 technologies include SorBET, ChoiCo, MaLT2, nQuire for students and GearsBot tools.

Each component of the course is briefly introduced and discussed using simple language, with citations to the sources for further reading. This is to ensure that teachers or concerned stakeholders will be able to understand the core ideas related to using design thinking and emerging technologies in teaching and learning as well as go through some relevant resources if they wish to find out more.

2.3 Activities

The course activities include a set of interactive tasks for learners including a quiz to evaluate understanding after completing certain sections (See Figure 4), reflective exercises related to the course content (See Figure 5), downloading learning materials, creating a set of tasks and experimenting with project technologies to produce learning artefacts.

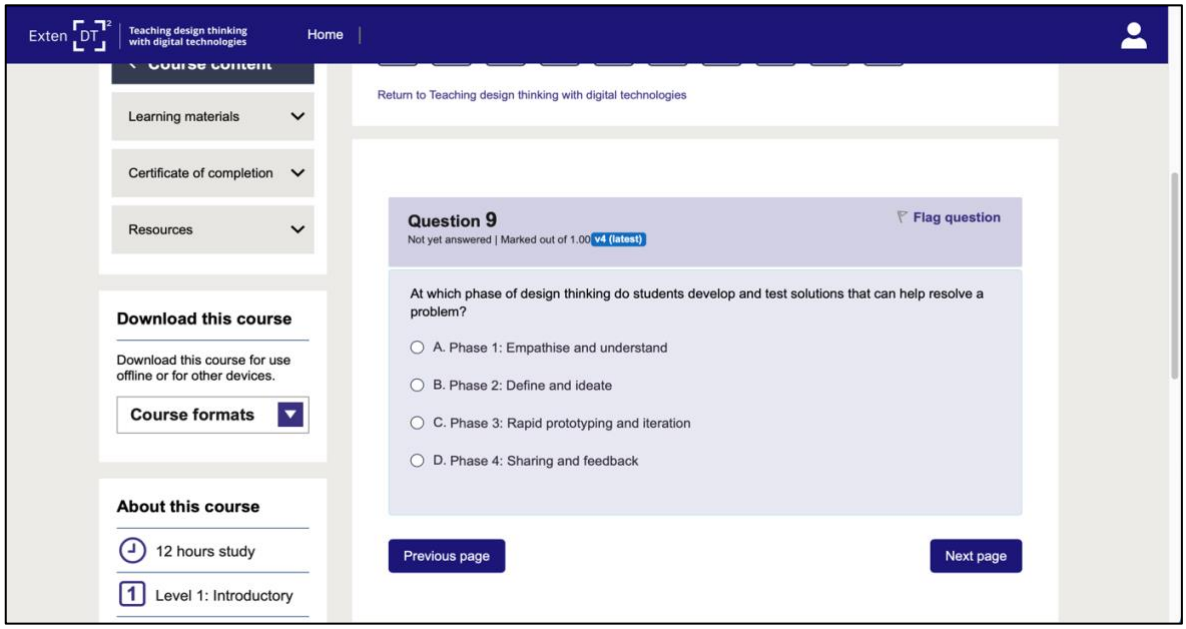


Figure 4. A screenshot of a quiz question

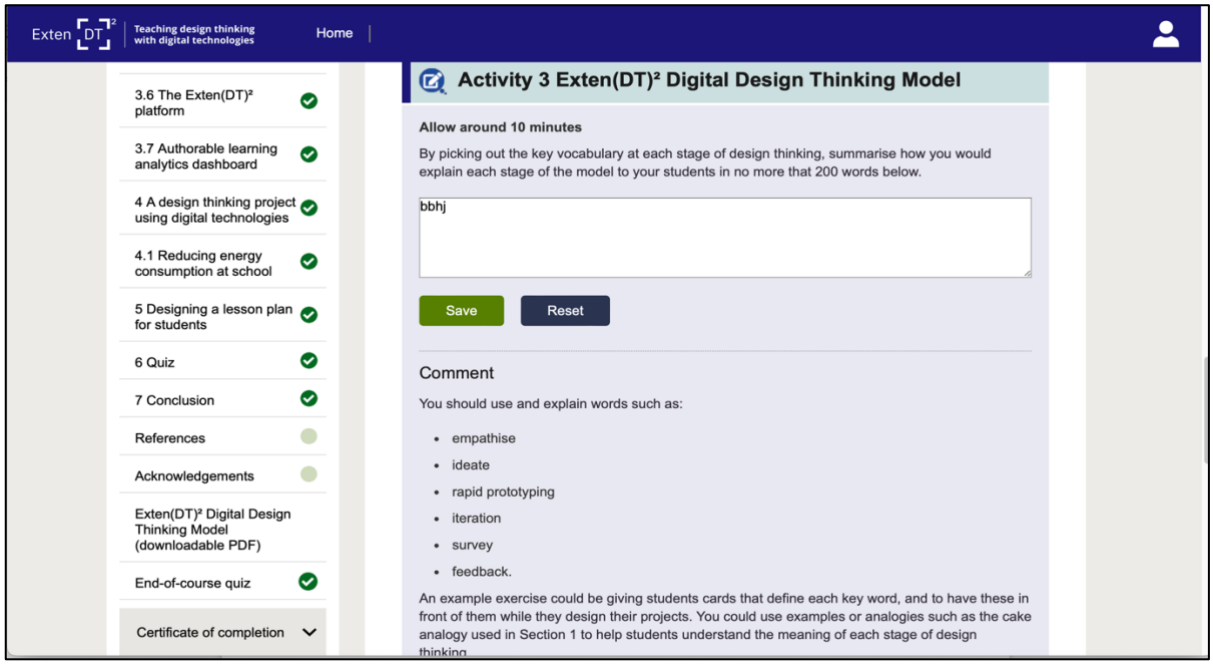


Figure 5. A screenshot of an in-line interactive discussion

2.4 Assessment

To receive a certificate of completion and a badge for participation in the course, learners need to achieve a score of 80% or higher in the end of course quiz. The end of course quiz consists of 10 questions that are updated each time a learner retakes the quiz. These questions aim at testing learners' knowledge and understanding of teaching with DT and how specific technologies can support DT stages. Feedback is given when a wrong response is selected aiming to help learners to select the correct answer. Specifically, upon the course completion, learners gain:

- A certificate of completion
- A digital badge
- Knowledge and skills in designing design thinking activities assisted by emerging technologies
- Knowledge and skills in using emerging technologies in teaching

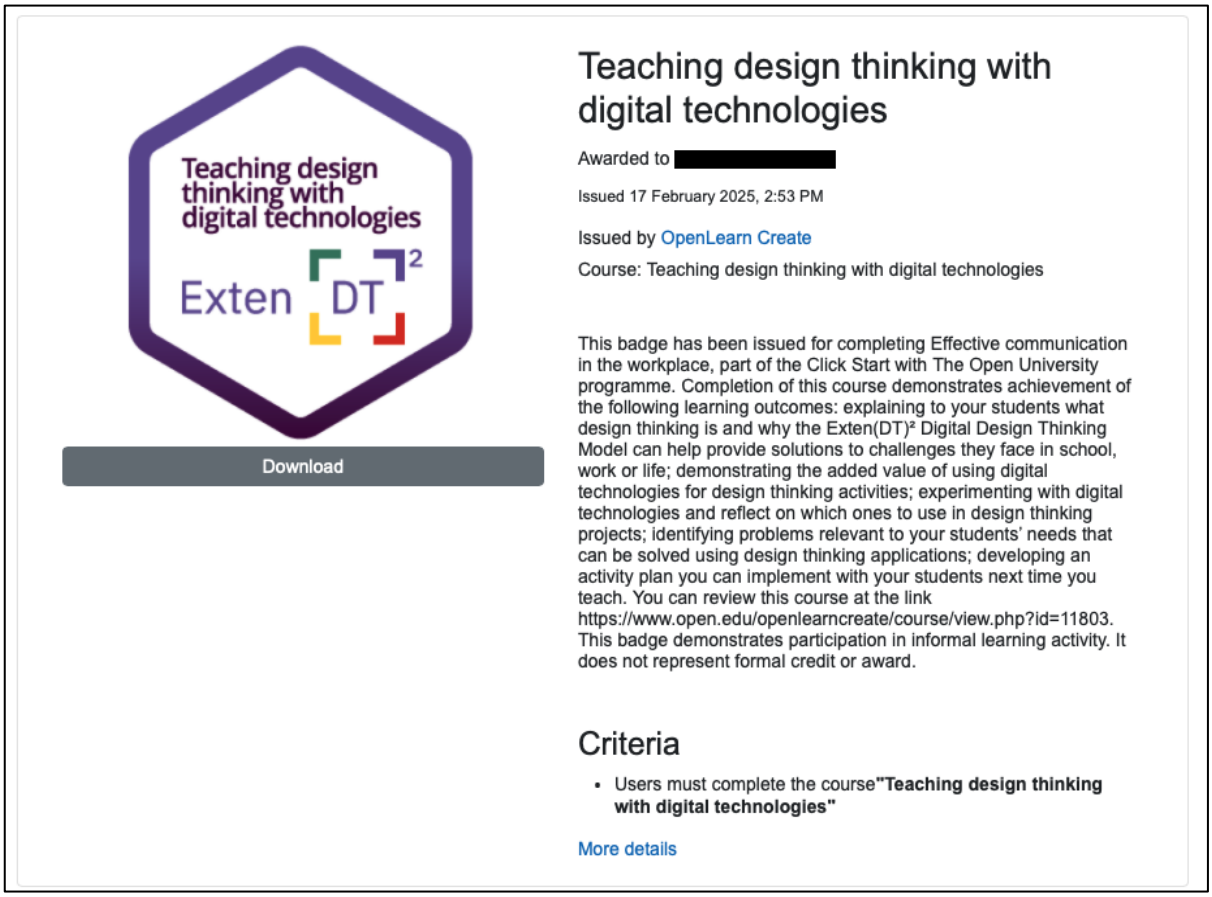


Figure 6. A screenshot of a digital badge awarded to a course participant

Below are example questions from the end of course quiz:

1. With nQuire for students, users...
   A. identify users' needs and collect feedback on a prototype.
   B. create a prototype.
   C. define parameters for a prototype.

2. Which of the following technologies can be used at the rapid prototyping and iteration stage?
   MaLT2
   nQuire for students
   ChoiCo
   GearsBot
   SorBET

3. Subject-related, design thinking and 21st-century related learning objectives can be covered in a design thinking project.
   True
   False

4. State whether the following sentence is true or false.
At Empathise and understand phase of design thinking, students explore the needs of users?
   True
   False

5. At which phase of design thinking do students develop and test solutions that can help resolve a problem?
   A. Phase 1: Empathise and understand
   B. Phase 2: Define and ideate
   C. Phase 3: Rapid prototyping and iteration
   D. Phase 4: Sharing and feedback

3. Development of an OpenLearn Create Course

This course is developed based on the Exten.(D.T.)^2 teacher professional development package prepared to support teachers in carrying out DT activities in Year 1 and Year 2. The teacher development package was implemented by each partner during the teacher induction before those teachers implemented DT activities in their classrooms. In preparation of the course, the project team considered the feedback received from teachers who took part in training workshops and improved the presentation and content of materials.

To produce the pilot version of the course, two iterations took place; a word version of the content of the course was shared with project partners for feedback. Based on the feedback received, version 1 was revised and sent to the OpenLearn Create Team at the Open

University. The Open Learn Create team provided technical feedback and made it align to the OpenLearn Create course infrastructure and requirements. The course was then further modified following feedback from the OpenLearn Create Team and launched as a pilot.

To pilot the online version of the course, a course link was sent to all six partners with a request to identify two interested participants, who would take part in the course and provide their feedback. A basic introductory draft to the course coupled with a brief tutorial (see Figure 7) was produced to guide the participants while joining the course.

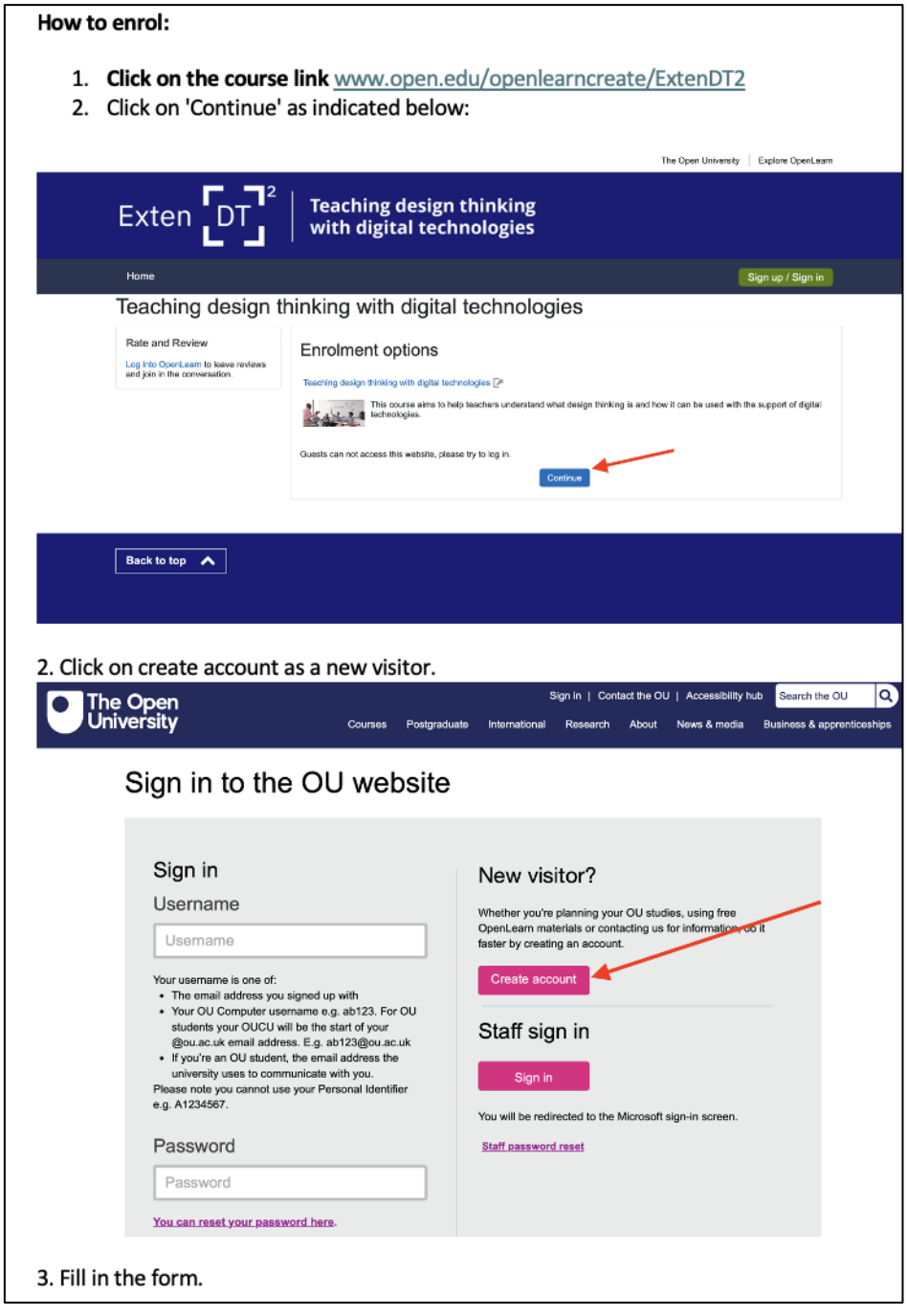


Figure 7. A screenshot of the tutorial to join the course

Four participants from the UK, Greece, Norway and Republic of Ireland joined the course. At the end of the pilot period which lasted three months (November 2024 to January 2025), feedback (see Figure 8 and Appendix 1) was collected using the form shown below.

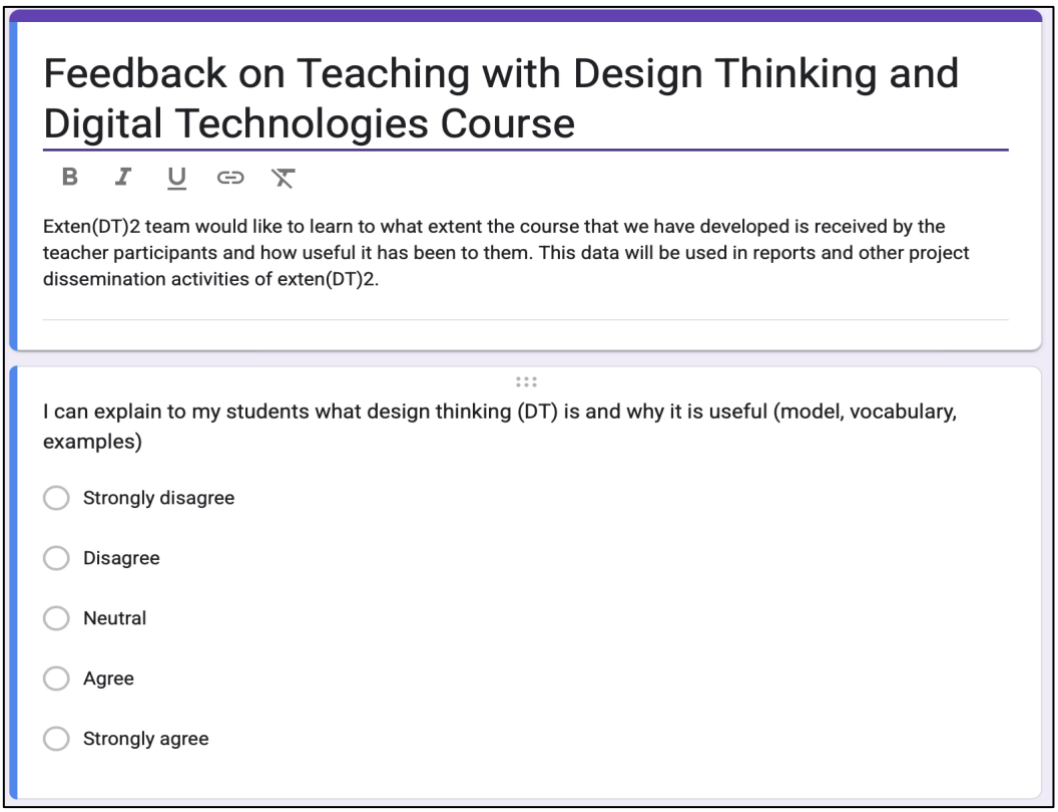
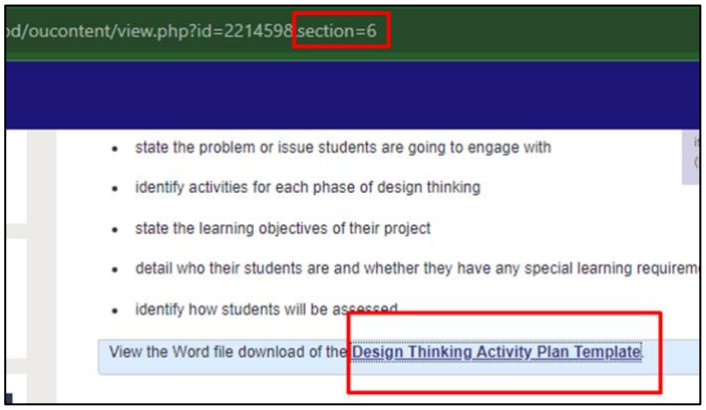


Figure 8. A screenshot of the feedback

Feedback was overall positive with recommendations for improving certain sections of the course such as the below:

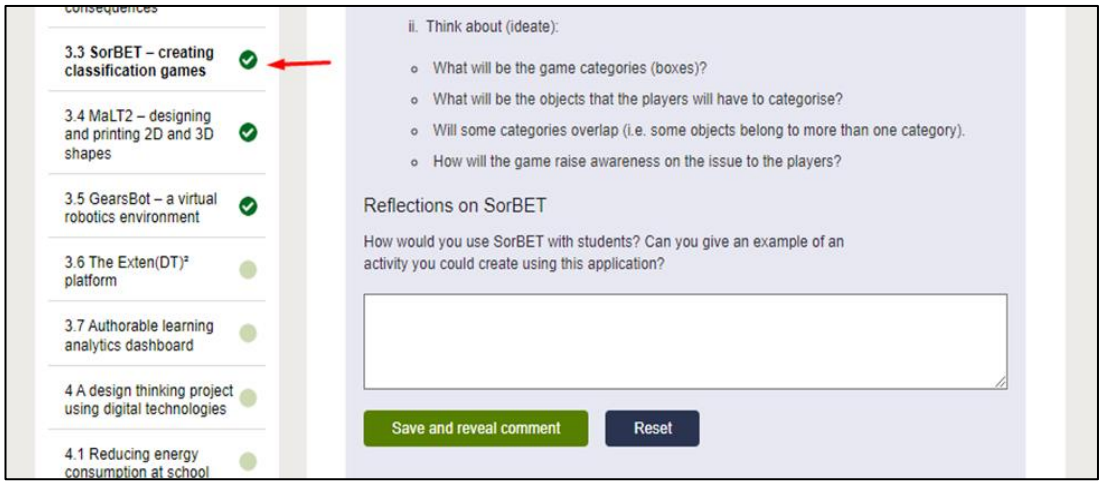
Feedback on course content

- Section 3.2: Encourage the participants to mention the age of the students they design for.
- Section 5: The Activity Plan template file has to be updated with the Year 3 activity plan.

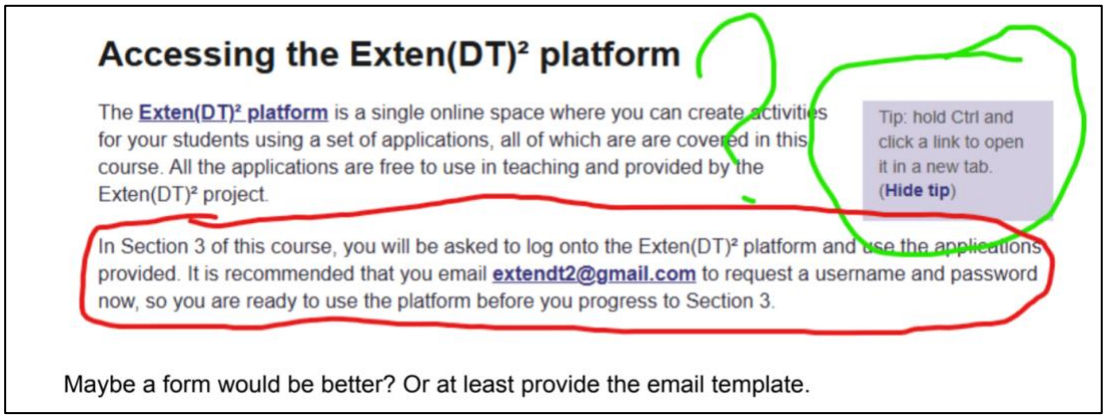


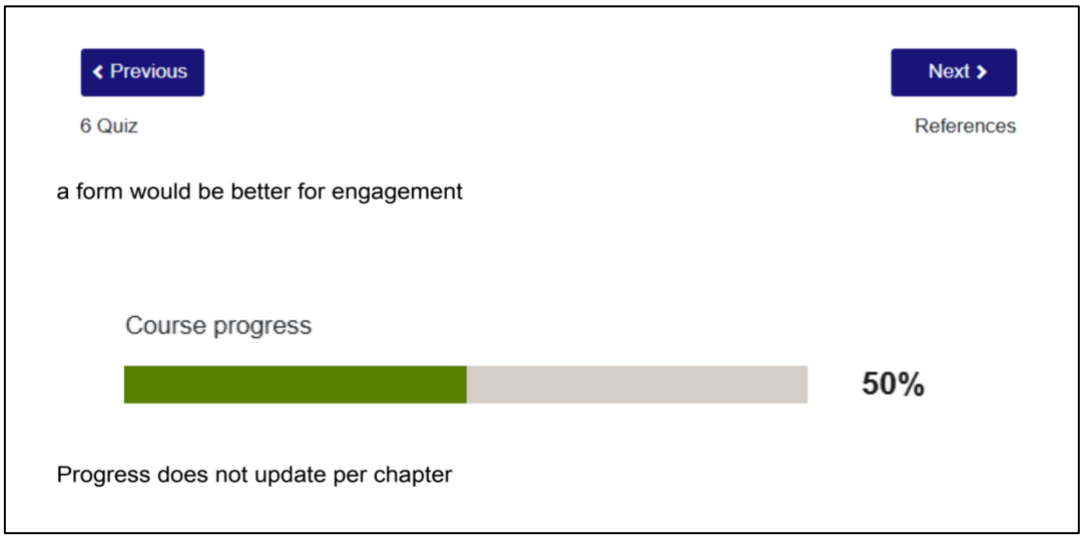
Feedback on functionalities and issues

- It is not clear why saving and revealing comments are in the same button. Maybe it would be better if they were two different buttons.



- In some cases, a step appears as completed even though I have not entered an answer in the text.





4. Next Steps

The final version of the course will be launched in March 2025, following improvements based on the feedback received, and it will remain open. It will be disseminated via the project website and partners' networks across the globe. It is expected to reach 2,000 participants. Given that the course is participant-regulated, the project team expect the learners to become engaged with it during and beyond the project period. The team is exploring ways to automate the generation of credentials for the Exten(DT)^2 platform, which at the time of writing (February 2025) are manually produced and emailed to learners. This will help ensure sustainability beyond the project period.

Appendix 1: A Complete Feedback Form

Feedback on Teaching with Design Thinking and Digital Technologies Course

Exten(DT)2 team would like to learn to what extent the course that we have developed is received by the teacher participants and how useful it has been to them. This data will be used in reports and other project dissemination activities of exten(DT)2.

I can explain to my students what design thinking (DT) is and why it is useful (model, vocabulary, examples)

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I am aware of a number of innovative digital technologies I can use in design thinking projects.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I know how to access and use the technologies I was introduced to.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I understand the added value of using digital technologies to design DT activities.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I identified a problem relevant to my students' needs that can be solved using DT and technologies.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I started developing (or have developed) an activity plan I can implement with my students next time I go to school.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I have started to plan how I can use digital technologies in future design DT activities with my students.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Are you willing to be contacted at a later date to discuss how you have benefitted from taking the course?

- ○ Yes
- ○ No

I would recommend this course to other teachers I know.

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly Agree

What would you like to change/improve in this course (if any)?

Short-answer text