

AVICO

CODING TRAINING WITH AVIATION TECHNOLOGIES

Methodological framework for VET providers



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Introduction

The AVICO project – Coding Training with Aviation Technologies is an Erasmus+ Cooperation Partnership in vocational education and training that aims to strengthen the connection between digital skills development, coding education, and unmanned aerial vehicle (UAV) technologies. The project responds to the rapid expansion of UAV applications across sectors such as agriculture, logistics, environmental monitoring, media, and public services, while recognising that vocational education systems often lack structured learning pathways that effectively combine drone technologies with coding and computational thinking.

A central outcome of the project is the development of a dedicated Moodle-based learning environment that hosts the AVICO training programme. This platform integrates curriculum content, open educational resources, coding exercises, UAV-related materials, and simulation-based activities within a structured and interactive online learning space. Designed to be accessible and adaptable, the platform supports vocational learners, educators, and training providers in engaging with innovative and practice-oriented learning experiences.

By combining coding as a transversal digital competence with UAV technologies as an applied learning context, AVICO promotes the development of technical skills, analytical thinking, and problem-solving abilities. At the same time, the Moodle Learning Management System (LMS) enables flexible and collaborative learning, allowing users to access materials, participate in activities, monitor progress, and interact with digital tools aligned with the project's learning objectives.

Within this framework, this document has been developed to support Vocational Education and Training (VET) providers in effectively understanding, adopting, and implementing the AVICO MOOC platform and simulation-based Simulation Kit. The guide goes beyond a purely technical explanation of the tools by providing a comprehensive methodological framework that enables teachers, trainers, and institutions to respond to the evolving needs of their students and trainees, particularly in relation to digital transformation, STEM education, and emerging technologies.

In a rapidly changing labour market, VET providers are increasingly required to equip learners with practical, transferable, and future-oriented skills. This document therefore combines technical guidance, pedagogical principles, and dissemination strategies into a single, coherent resource. It is designed to support VET providers in understanding the structure and educational value of the AVICO tools, applying them in diverse teaching and training contexts, and adapting them to different learner profiles, institutional capacities, and local needs.

As such, the document functions both as a practical user guide for navigating and using the AVICO learning environment, and as a strategic implementation framework that facilitates the transfer, scalability, and sustainability of project results across different VET systems in Europe.

1 AVICO MOOC Overview

The AVICO MOOC (Massive Open Online Course) is an integral component of the AVICO project, which aims to modernize vocational education by integrating coding education and



unmanned aerial vehicle (UAV) technologies into teaching and learning processes. The platform is designed as an open-access, digital learning environment that supports flexible, scalable, and innovative education for a broad range of learners, particularly within vocational education and training (VET) contexts.

1.1 Objectives of the MOOC

The main objectives of the AVICO MOOC are to:

- Enhance vocational education through the integration of digital technologies and coding skills
- Introduce learners to UAV (drone) technologies as an applied learning context
- Promote project-based and practice-oriented learning approaches
- Support educators with open educational resources (OER) and structured curricula
- Improve digital competences and employability skills of learners in a modern labour market

Overall, the MOOC aims to bridge the gap between traditional vocational training and the demands of a rapidly evolving digital and technological environment.

1.1.1 Structure of the MOOC

The AVICO MOOC is structured as a modular online learning system that allows learners to progress through content in a flexible and self-paced manner. Key structural elements include:

- Thematic modules focused on coding and UAV applications
- Video lectures and instructional materials
- Exercises and practical coding tasks
- Simulation-based learning activities using drone-related scenarios
- Quizzes and self-assessment tools
- Multilingual course availability to support accessibility across partner countries

The structure follows a progressive learning model, where theoretical knowledge is continuously connected with practical application.

1.1.2 Learning Outcomes

Upon completion of the AVICO MOOC, learners are expected to:

- Understand basic and intermediate coding principles
- Apply coding skills in UAV and simulation environments
- Develop problem-solving and computational thinking skills
- Work effectively in project-based learning settings
- Demonstrate improved digital literacy and technical competence

- Apply knowledge in real-world vocational and technological contexts

These outcomes are designed to support both educational development and future employability in technology-oriented sectors.

1.1.3 Pedagogical logic

The pedagogical foundation of the AVICO MOOC is based on modern learner-centred approaches, combining constructivist and experiential learning principles. The core pedagogical logic includes:

- **Project-based learning (PBL):** learners acquire knowledge through real-world tasks and UAV-related projects
- **Blended coding education:** combining block-based and text-based programming approaches
- **Experiential learning:** emphasis on learning by doing through simulations and practical exercises
- **Self-paced learning:** allowing flexibility and adaptation to individual learning needs
- **Collaborative learning environment:** encouraging interaction among learners and educators across countries

This approach aligns with contemporary MOOC design principles, which emphasize scalability, accessibility, and interactive engagement in digital learning environments.

2 AVICO MOOC Platform User Guide

2.1 Accessing the AVICO MOOC Platform

Welcome to the AVICO e-learning platform! This system is hosted on <https://mooc.avico-project.com> platform (Figure 1).

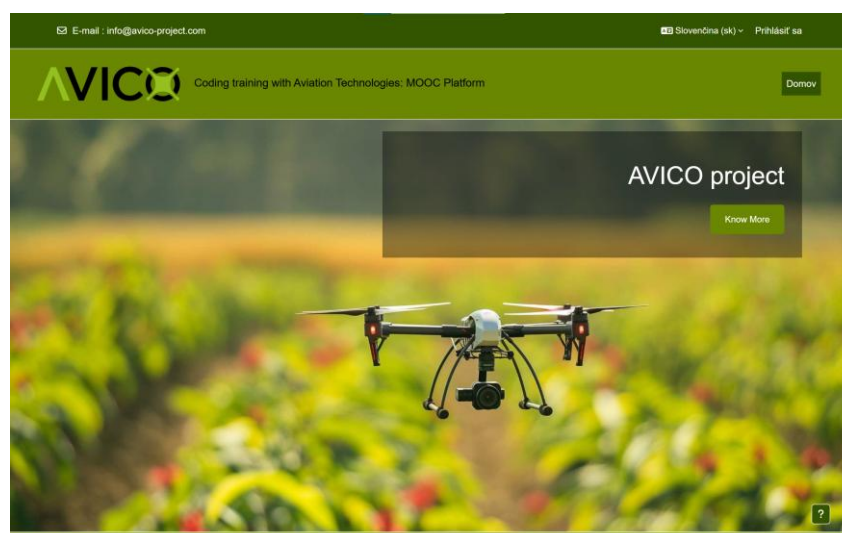


Figure 1 Title page of the AVICO MOOC platform



The platform is specifically designed to support interactive learning, professional development, and cross-institutional collaboration within educational projects. Access to the platform is available in this way. For all the participants, access is through **email registration**: fill out the form, verify your email, and log in with the credentials you create.

These login options grant complete access to all AVICO course materials, digital resources, and platform features.

For access via a local user account follow below steps.

1. Visit the Platform: Open your web browser and go to <https://mooc.avico-project.com/login/index.php>
2. Select Log in using a local user account

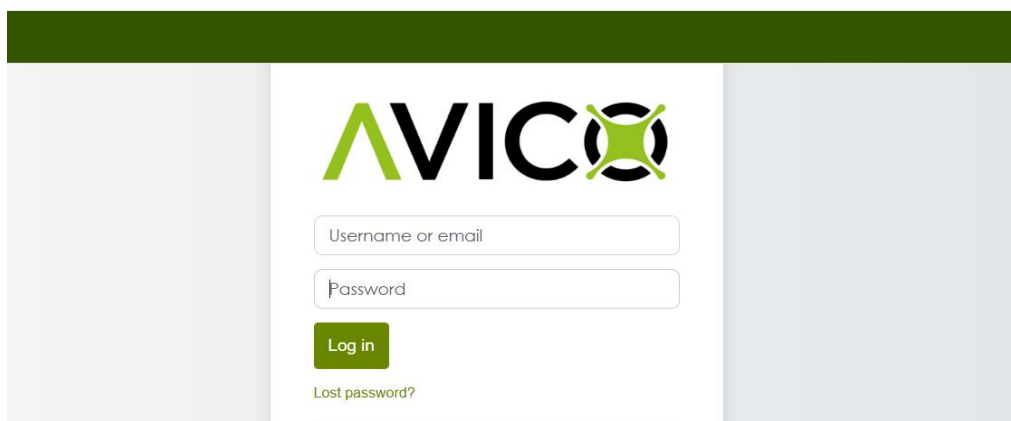


Figure 2 Log in using a local user account

3. If you do not have an account, select the option to Create a new account.

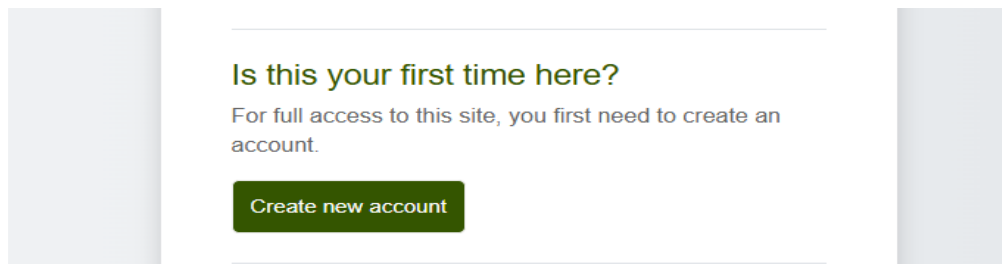


Figure 3 Creation of a new account

Is this your first time here?

You must complete the following steps in order to gain access to e-courses:

1. Fill out the [New Account](#) web form with your personal details.
2. After submitting the form, you should receive an email at the email address you provided.
3. Please carefully read the email and click on the link in order to confirm your registration and log in to the system.

Check out our [quick guide](#) on logging into the MoD system.

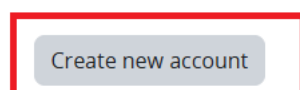




Figure 4 **Create a new account**

4. Select the Option to Register with Your Email Address

Fill out the registration form by entering the required personal details (name, email address, password, city, country etc.).

A screenshot of a web registration form titled "New account". The form contains several input fields, each with a red exclamation mark icon indicating a required field. The fields are: Username, Password, Email address, Email (again), First name, and Last name. Below the Password field, there is a text instruction: "The password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s)".

Figure 5 Registration form

Click **Create my new account** to complete the registration.

5. Verify Your Email

After submitting the form, you will receive an email with a confirmation link.

An email should have been sent to your address at [\[redacted\]@gmail.com](#)

It contains easy instructions to complete your registration.

If you continue to have difficulty, contact the site administrator.




Figure 6 **Check an email with a confirmation link.**

Click on the link in the email to verify and activate your account.



Coding training with Aviation Technologies: MOOC Platform: account confirmation > Pristigla pošta x

 **Admin User (via AVICO)** <noreply@mooc.avico-project.com>
prima ja ▾

Hi Ivana,

A new account has been requested at 'Coding training with Aviation Technologies: MOOC Platform' using your email address.

To confirm your new account, please go to this web address:

<https://mooc.avico-project.com/login/confirm.php?data=ISP1IE6pwOmNJWR/ikg>

In most mail programs, this should appear as a blue link which you can just click on. If that doesn't work, then cut and paste the address into the address line at the top of your web browser window.

If you need help, please contact the site administrator,

Admin User



Figure 7 Email with a confirmation link

2.2 Course Overview

This section offers a complete guide on how to access and navigate your courses effectively. From locating your enrolled courses to exploring individual topics and finishing assignments, you will understand the platform's layout and features.

2.2.1 Access Course List

Once you log in, you will find a navigation menu in the top left corner with the following options: **Home**, **Dashboard**, and **My courses**. Click on **My courses** to view the list of courses you are enrolled in.



Figure 8 Menu item with the list of courses

Click on the course name to access its content. You are choosing between the enrollment of courses in the consortium languages.

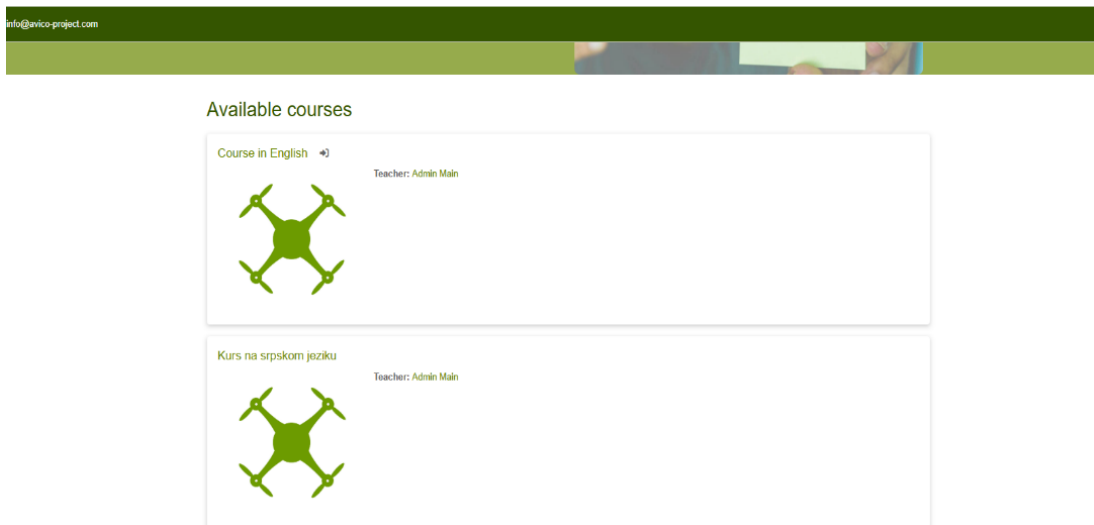


Figure 9 Available courses

No enrollment key is required; participants can self-enroll.

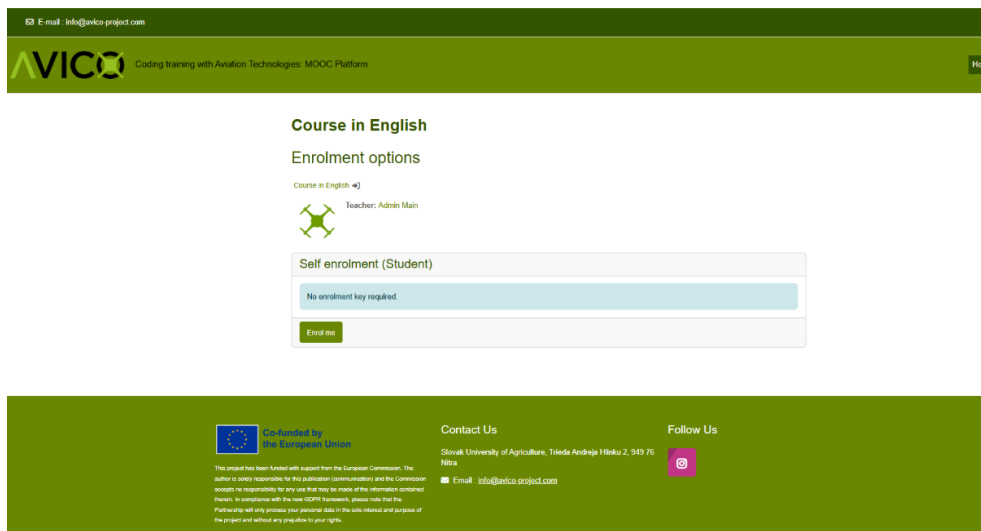


Figure 10 Enrollment into courses

2.3 Navigating the Course

The **General topic** acts as the main hub for the course. It offers key information like a brief overview of the course objectives and structure, along with important announcements or updates related to the course (**Notifications**). **Also, this section presents the Glossary section of the AVICO MOOC platform.**

The course content is arranged into topics on the left side. Click on each topic to view its contents, which may include lessons, presentations, videos, quizzes, and more.

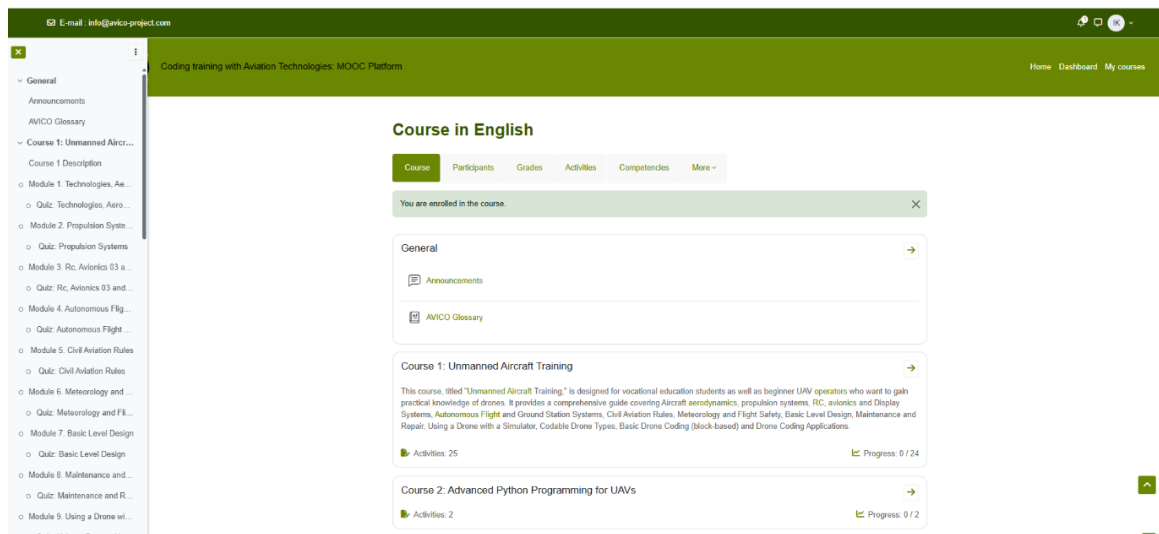


Figure 11 Structure of the course

Each course is divided into:

- modules accompanied by
- the course's description,
- modules' objectives,
- learning outcomes,
- module organization,
- study recommendations,
- recommended time for completing the module,
- section for further thoughts and discussion.

You can access assignments and quizzes within their specific topics by clicking on the title of the assignment or quiz. This will open the activity where you can follow the instructions provided to submit your assignment or complete the quiz.

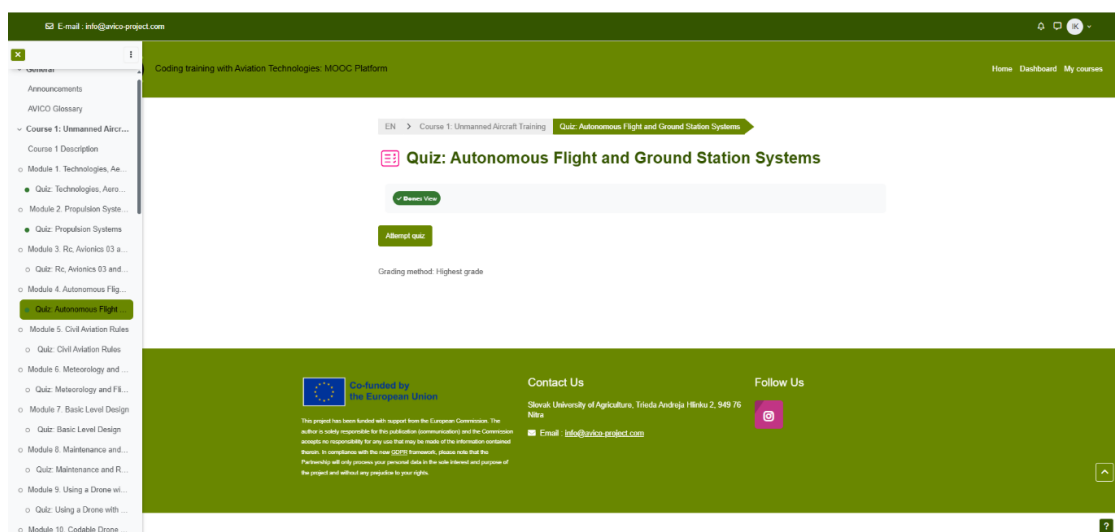


Figure 12 Access to the quiz

2.4 Communication and Support

Stay updated by checking notifications regularly. Use them to get updates about course activities, upcoming deadlines, or important announcements. Plus, you can interact with peers and instructors by participating in discussions or asking questions directly through notification-linked forums or posts.



Figure 13 Communication section

3 Simulation Kit (Simulation) Guide

In the AVICO approach, the MOOC platform and the Simulation Kit are not separate or disconnected components. The MOOC platform provides theoretical content, modular learning structure, learning objectives, course guidance, quizzes and assignment areas. The Simulation Kit supports the practical application of selected knowledge through coding, simulation, mission logic, data interpretation or classroom-based tasks.

The Simulation Kit is understood as a practical support component of the AVICO MOOC platform. It helps learners move from the concepts presented in the online modules to task-oriented practice in a structured and safe learning environment (Table 1).

Table 1 A connections between AVICO MOOC and Simulation Kit

MOOC platform	Simulation Kit	Combined use result
Provides module, objective, content and instruction.	Provides task, simulation and application space.	Learners move from theory to practice.
Supports quizzes and assignments.	Supports coding, task testing, data interpretation and simulation.	Learning outputs become more visible.
Offers a structured digital learning environment.	Creates a practical or simulated learning experience.	Teachers can connect guidance, activity and feedback.

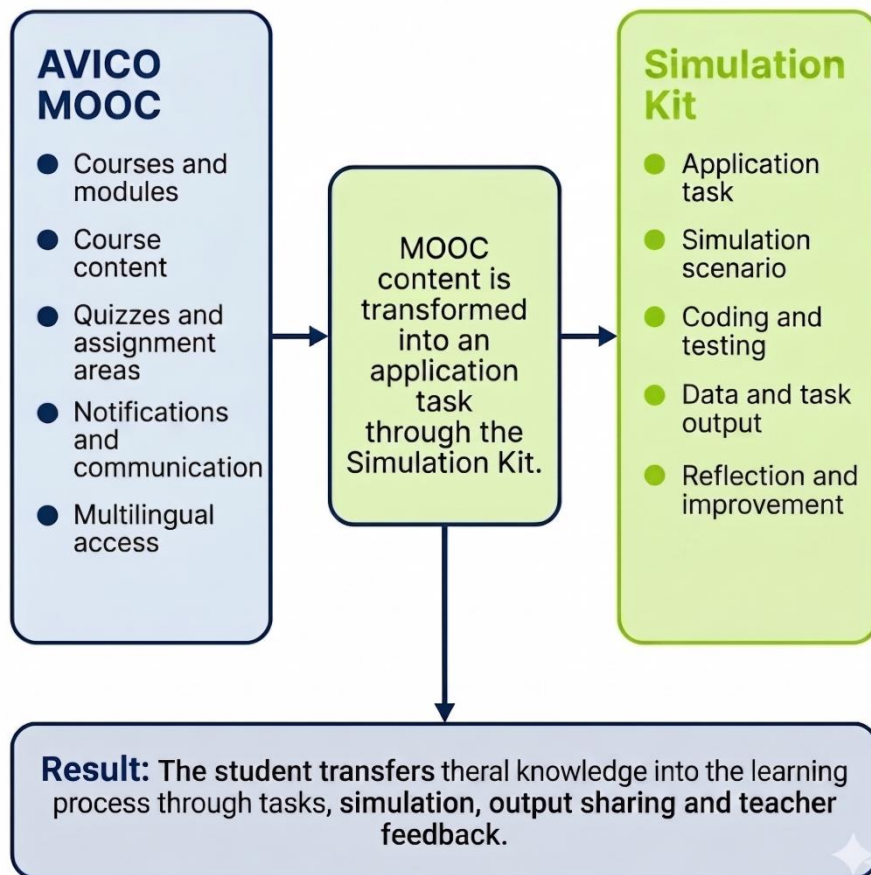


Figure 14 MOOC and Simulation Kit integration logic

The key point is that the MOOC platform should not be seen only as a content repository. It also creates a structured learning space where Simulation Kit activities can be introduced, connected with course tasks, submitted as outputs and discussed through feedback.

3.1 Pedagogical use scenario of the Simulation Kit

The Simulation Kit supports learners in transferring the knowledge acquired through the AVICO MOOC into practice. Its central function is to build a bridge between theoretical modules hosted on the Moodle platform and practical, simulation-based or classroom-based learning activities.

The pedagogical use scenario is based on gradual learning. Learners first become familiar with the key concepts through the MOOC platform. They then apply selected knowledge or skills in guided practical tasks. These tasks may include coding exercises, simple mission planning, interpretation of UAV-related data, GIS activities or simulation scenarios, depending on institutional conditions and available tools.

The Simulation Kit describes a standard five-phase protocol for experimental tasks. This protocol can be translated into a practical use flow as Table 2 shows.

Table 2 Standard five-phase protocol for Simulation Kit tasks

Phase	Pedagogical Concept Meaning	Practical equivalent
Concept	Problem framing and theoretical foundation.	The learner understands the task objective and the related MOOC module.
Setup	Safety, environment and tool preparation.	The teacher prepares the appropriate environment, tools and instructions.
Action	Implementation and mission execution.	The learner applies the task through coding, simulation or practical work.
Data processing	Analysis and visualisation.	The learner observes, records or interprets the output.
Conclusion	Reflective debriefing and optimisation.	The learner shares the result and receives feedback for improvement.

3.2 Teacher usage flow

In this guide, the teacher is not positioned only as a transmitter of information. The teacher acts as a facilitator who helps learners move from MOOC content to Simulation Kit activity. The teacher connects the module, the task, the expected output and the feedback process (Figure 15 Teacher and student usage flow).

1. Accesses the AVICO MOOC platform and opens the relevant course.
2. Reviews the module structure, learning objectives, learning outcomes and study recommendations.
3. Identifies the application task that can be connected with the Simulation Kit.
4. Explains the purpose of the task, the expected output and the materials to be used.
5. Organises learners for individual work, pair work or small group work.
6. Monitors the coding, simulation, data analysis or task implementation process.
7. Requests learners to share their outputs through Moodle assignment, a short report, a screenshot, code output or an observation sheet.
8. Supports learning through quizzes, discussion forums or classroom reflection activities where appropriate.
9. Provides feedback on the student outputs.
10. Archives activity evidence for reporting or institutional use.

Teacher focus

The teacher does not need to create a new software function. The teacher's role is to connect the existing MOOC content with an appropriate Simulation Kit activity and guide the learner through the process.

3.3 Student usage flow

The student usage flow starts with platform access and continues until the task output is shared and teacher feedback is received (Figure 15 Teacher and student usage flow).

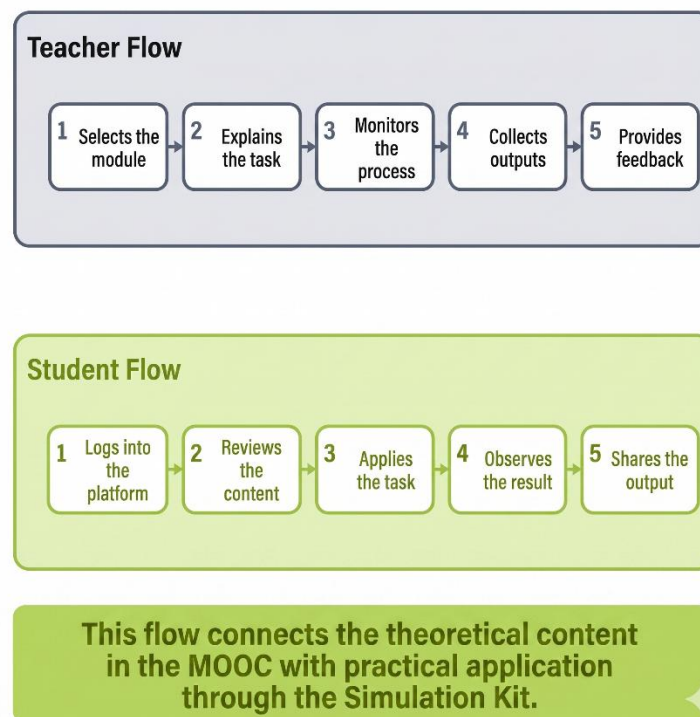


Figure 15 Teacher and student usage flow

It is a practical learning sequence that connects online content with task-based implementation.

1. The learner logs into the AVICO MOOC platform.
2. The learner opens the course and module indicated by the teacher.
3. The learner reviews the module description, learning objectives, instructions and any supporting quiz or material.
4. The learner reads the application task connected with the Simulation Kit.
5. The learner uses the suitable coding, simulation, data analysis or classroom-based application environment.
6. The learner runs the code, flight logic, data task or simulation scenario.

7. The learner observes the result. This result may be a flight route, screen output, data table, map, graph or task report.
8. If there is an error, deviation or missing element, the learner corrects the solution and tries again.
9. The learner shares the final output through Moodle or submits it to the teacher as a short task report.
10. The learner receives teacher feedback and, where appropriate, joins a class discussion.

3.4 Moodle integration options

This section responds directly to the practical need identified during coordination: how can the Simulation Kit be shown or connected within the MOOC platform? The safest approach is not to claim a new or fixed technical feature. Instead, the Simulation Kit can be integrated as a learning activity supported by existing Moodle-based formats (Table 3).

Table 3 Integration of the Simulation Kit as a learning activity

Integration format	How it can be used	Evidence or output example
Instruction linked with course content	The teacher places or explains the Simulation Kit task within the relevant module context.	Task instruction or working guide.
Assignment	The learner uploads a simulation result, code output, screenshot or short report.	Moodle submission, short report, screenshot.
Quiz followed by application	A quiz checks theoretical understanding before the practical task.	Quiz result and application output.
Forum or discussion area	Learners discuss task results, errors and alternative solutions.	Forum posts, peer comments.
External link or downloadable material	The task sheet, simulation file or support document is provided as a link or file.	Link, worksheet, downloadable material.
Classroom or laboratory implementation	The MOOC module is used before or during classroom practice.	Teacher observation note, activity photo, group output.
Short demonstration for dissemination	The task is presented in a seminar, workshop or stakeholder event.	Presentation slide, screenshot, demonstration note.

Safe wording boundary

This section avoids statements such as “the platform definitely contains this specific button or function” unless such a feature is visible and confirmed. It uses safe Moodle-based formats such as assignment, quiz, forum, link, file, screenshot and report.

3.5 Sample use scenario: ST-01 The Perfect Square

Among the practical simulation scenarios included in the Simulation Kit, ST-01 The Perfect Square is linked with Course 1 / Module 11. The objective of the task is to master block-based logic for trajectory control. The expected output is automated take-off, a square path and precision landing (

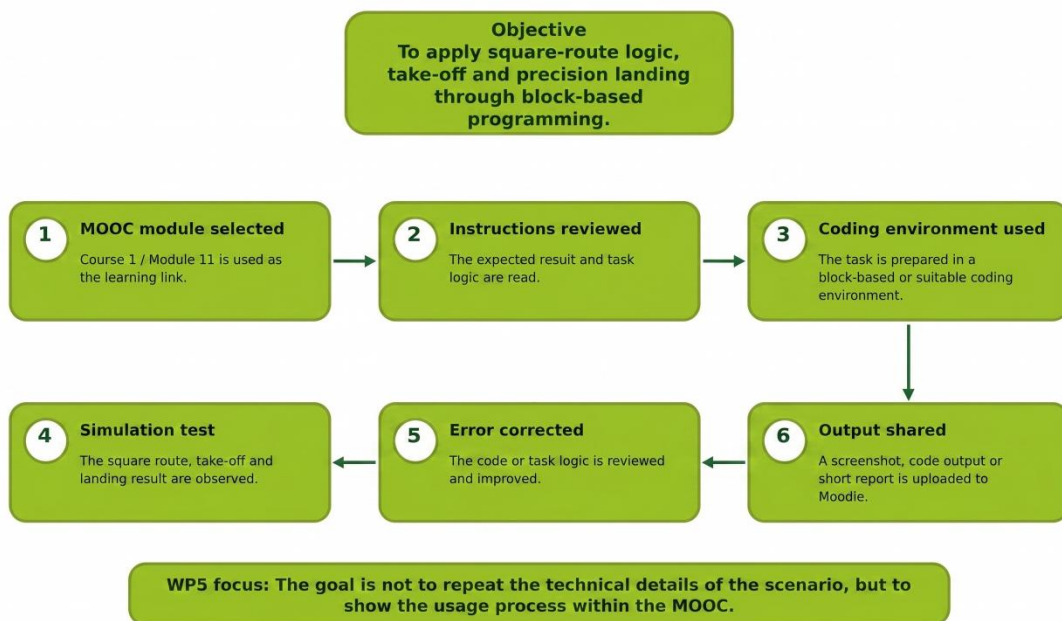


Figure 16 Sample scenario flow for ST-01 The Perfect Square. Table 4).

Table 4 Steps for AVICO MOOC Platform and the Simulation Kit combined use

Step	MOOC and Simulation Kit combined use
1	The teacher selects the content related to Course 1 / Module 11.
2	Learners review the basic information, instructions and expected learning focus in the MOOC module.
3	The teacher introduces the ST-01 task as a practical Simulation Kit activity.
4	Learners prepare the square-route logic using a block-based or suitable coding

	environment.
5	The task is tested in the simulation environment.
6	Learners observe whether the take-off, square path and landing are completed as expected.
7	If the result is not correct, learners review the code or task logic and try again.
8	Learners prepare evidence such as a screenshot, code output, short report or observation sheet.
9	The output is uploaded to Moodle or submitted to the teacher.

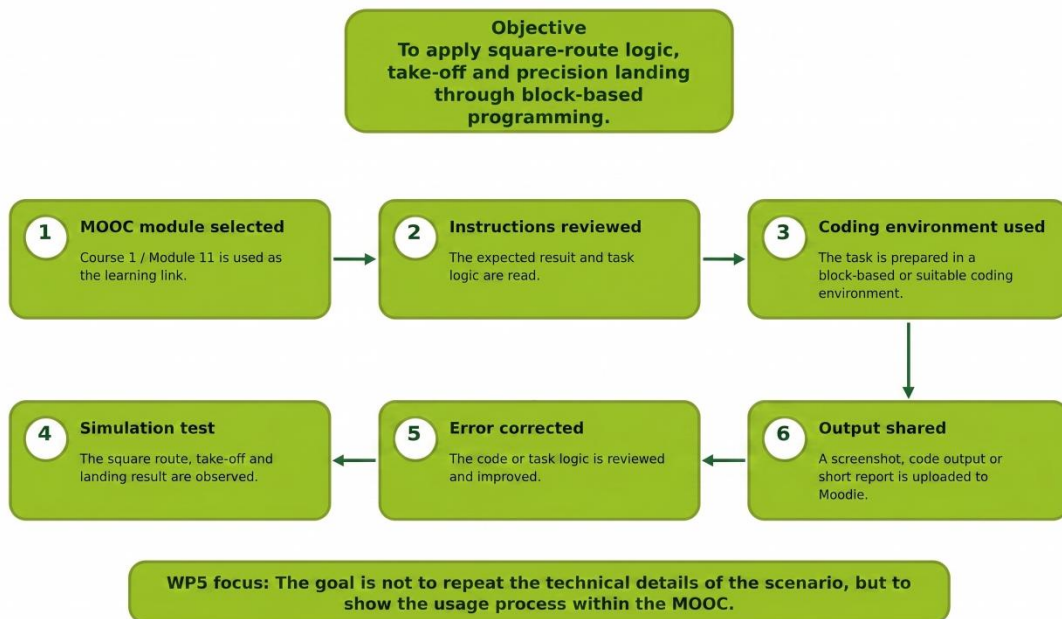


Figure 16 Sample scenario flow for ST-01 The Perfect Square.

This example makes the MOOC-based use of the Simulation Kit more concrete. The same approach can be adapted for other tasks included in the Simulation Kit. However, each institution should select the implementation level according to its learner profile, available equipment, digital tools and teaching conditions.

3.6 Assessment, feedback and implementation evidence

The Simulation Kit presents a multidimensional assessment approach based on safety, technical accuracy, analytical depth and documentation. This Guide does not recreate that rubric in full. Instead, it shows how the same assessment and documentation logic can be used in a practical and reportable way within the MOOC environment.

The purpose of this section is not to design a new assessment system. Its purpose is to translate the existing AVICO assessment and documentation logic into practical evidence types that teachers and institutions can use (Table 5).

Table 5 AVICO assessment and documentation logic

Evidence type	Student output	Teacher use
Screenshot	Simulation result, route, quiz or task screen.	Shows that the activity was completed and the result was observed.
Code output or file	Block-based code, Python output or task file.	Provides evidence for technical accuracy and problem solving.
Short task report	A short explanation of aim, process, result and correction.	Supports reflection and documentation.
Moodle assignment	Uploaded file, screenshot, report or link.	Creates platform-based evidence of participation.
Quiz result	Theoretical preparation or self-assessment score.	Supports the link between theory and practice.
Forum or discussion contribution	Learner reflection, peer question or solution idea.	Supports collaborative learning and feedback.
Teacher observation note	Classroom or laboratory observation.	Supports institutional reporting and quality control.

3.7 Adaptation, dissemination and sustainable use

This framework supports the idea that the AVICO approach can be adapted, transferred and sustained across different institutions and learner profiles. This guide follows the same logic. It does not require a single fixed implementation model. Instead, it supports flexible use in different VET contexts.

The AVICO outputs allow different implementation models, including classroom integration, blended learning, project-based learning and extracurricular activities. Therefore, the Simulation Kit can be used not only as a complete long training sequence, but also as selected practical tasks, short demonstrations, project-based assignments or complementary classroom activities.

This guide also has a dissemination and sustainability role. In national stakeholder seminars, workshops, pilot demonstrations and institutional cooperation activities, the MOOC and Simulation Kit can be presented together through a simple message: the MOOC provides the learning structure, and the Simulation Kit provides the practical application route.

Sustainable use principle

The MOOC platform provides theoretical and digital learning structure. The Simulation Kit turns this structure into practice, testing, output production and feedback. This connection supports post-project use and transferability.

4 Conclusion

This guide has been prepared to explain the relationship between the AVICO MOOC platform and the Experiment Simulation Kit in a practical context. The document does not replace the technical Simulation Kit output, but it clarifies how the existing tools can be used together in teaching, learning, dissemination and sustainable exploitation activities.

The main contribution of the guide is to bring together the MOOC platform, Simulation Kit, pedagogical use, practical task flow, assessment evidence and sustainability logic into one practical integration framework. In this way, teachers, trainers and VET providers can understand how to move from digital course content to task-based simulation practice without creating unnecessary new work or reporting risk.

In conclusion, the AVICO MOOC platform provides the learning content and digital training environment. The Simulation Kit transfers this learning into application, simulation, task solving and output production.