

Training programme for the mentors of the bivalve mollusc aquaculture sector

Work Package: 3

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MODULE 2

**1.
Short
description**

It provides mentors with knowledge and skills related to distance learning, exploring pedagogical aspects, digital tools, and innovative teaching strategies

**2.
Objectives**

Mentors will be familiar with distance learning, its pedagogical aspects, platforms for digital learning and competences on the tools and strategies needed to deliver the OPTIMA online training course

**3.
Learning
outcomes**

Create a dedicated cloud space, structure the sharing space in an effective and functional way and use the digital technologies and tools in remote mentoring

**4.
Prerequisites**

Not applicable

**5.
Duration**

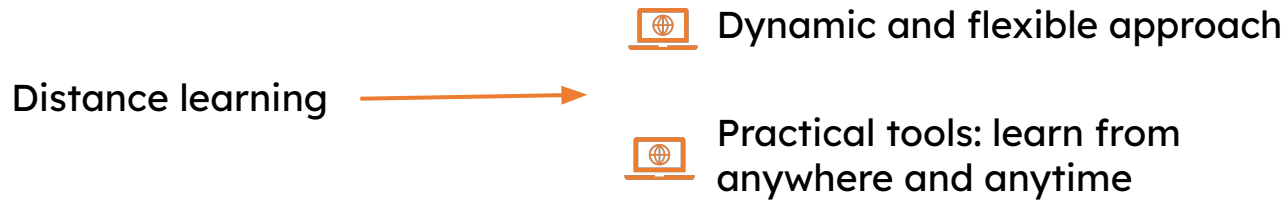
160 minutes (100 face to face online, 60 e-learning)



MODULE 2

2. Digital environment related to the training: from traditional to virtual classroom

2.1 Knowing about distance/online learning and the pedagogy related to it

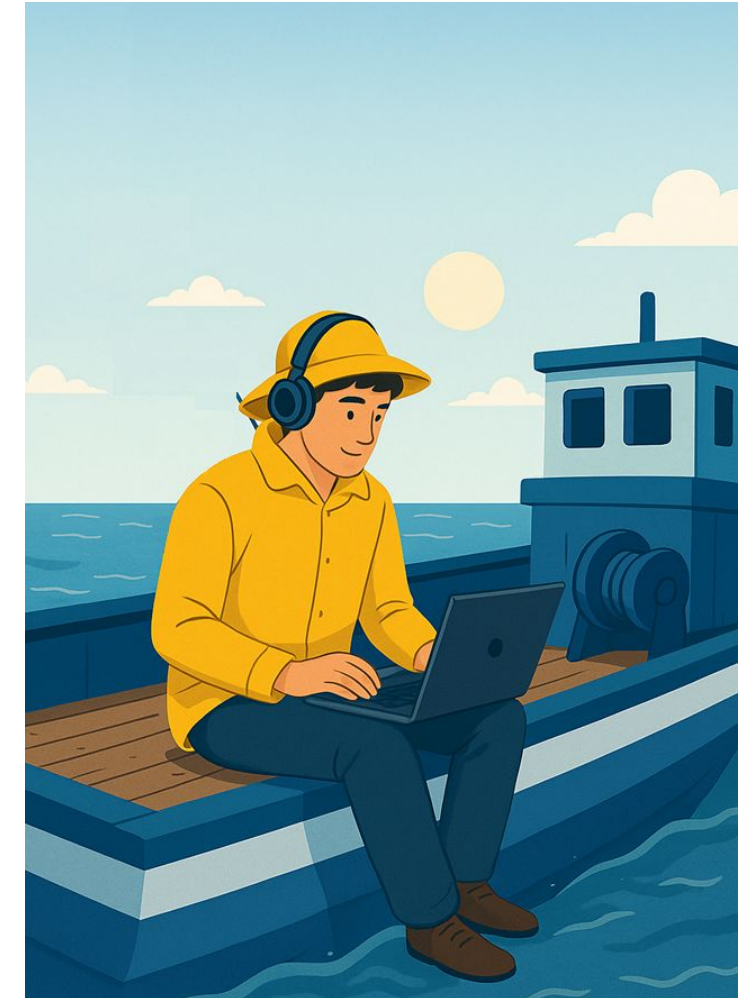


2.1.1 Concrete examples of distance learning delivery methods (e-learning, blended learning, virtual classroom)

- **E-learning:**

- Access to digital learning materials anytime and anywhere
- Asynchronous form of learning
- Tools: videos, readings, audio recordings, and interactive exercises
- Suitable for adult students, professionals or anyone who needs to balance study with work

E.g.: course offered through a **Learning Management System (LMS)** platform, such as Moodle, Coursera, edX, or Udemy



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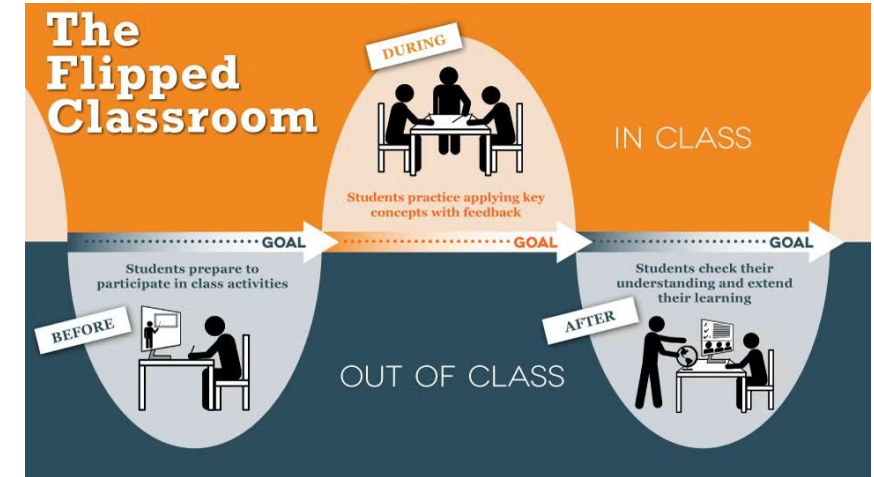
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2.1 Knowing about distance/online learning and the pedagogy related to it

- **Blended learning:**

- Integrates online and in-person elements to create a more dynamic and interactive learning experience
- Suitable for schools, universities, and corporate training programs

E.g.: **flipped classroom** where students study theoretical content at home, while class time is used for practical activities, collaborative exercises, and direct interaction with the teacher



- **Virtual classroom:**

- Replicates a traditional classroom environment in real time
- Synchronous method: requires students and teachers to be connected simultaneously
- Tools: breakout rooms for group discussions, shared digital whiteboards, screen sharing, and live Q&A session
- Suitable for primary and secondary education or university seminars where it is important to maintain a sense of community and continuity

E.g.: **video conferencing tools** such as Zoom, Microsoft Teams or Google Meet



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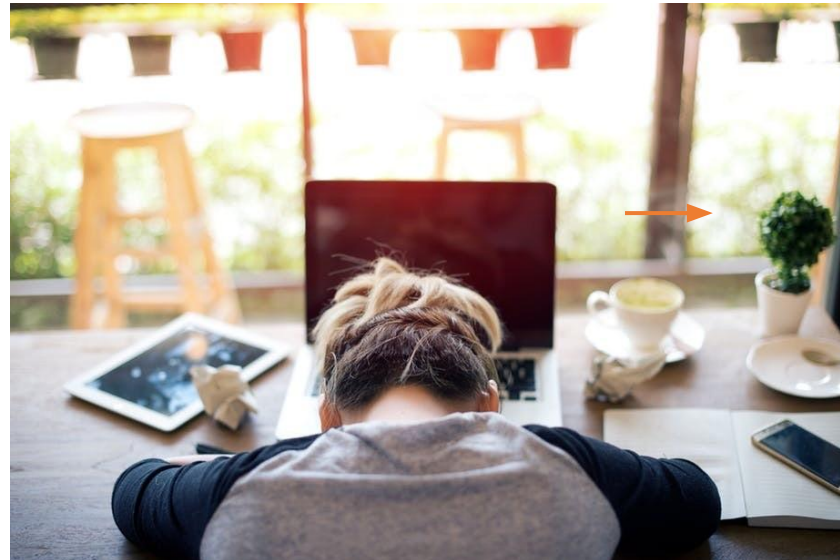
2.1.2 Most common difficulties related to distance learning: motivation, isolation, technical difficulties

☹️ Difficulties:

- **Loss of motivation**
- **Absence of physical contact** which may lead to decrease in commitment
- **Isolation**
- **Lack of spontaneous social interactions** may cause a sense of detachment and loneliness and a lower propensity to ask for clarifications or to actively participate
- **Technical difficulties** such as Internet connection problems, software incompatibilities, and lack of familiarity with platforms



Adequate technical support and clear preliminary preparation



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2.1.3 Main differences between in-person and remote mentoring, the role of facilitator and the importance of participant engagement

Mentoring: powerful educational and development tool, aiming to guide, support, and inspire students.



In-person mentoring

Communication is **rich** and **multidimensional**: nonverbal cues, posture, gestures, and eye contact.

Physical presence facilitates building trust and a closer relationship.

Mentors can **quickly adapt** the needs of the class thanks to the natural spontaneity of interactions.



Remote mentoring

Lack of physical presence can create a sense of distance.



Mentors must act as **motivators** and **facilitators**, creating a stimulating, inclusive, and engaging virtual environment.

Distractions are numerous, and attention spans often decline.



Mentors should integrate concrete **examples** incorporating **interactive exercises** such as quizzes, live polls, collaborative activities.



Opportunities for innovation:

If carefully designed and facilitated, it can be as impactful as in-person mentoring, thanks to its **flexibility** and **potential for customization**.

The key lies in the mentor's ability to adapt, engage, and bring learning to life.

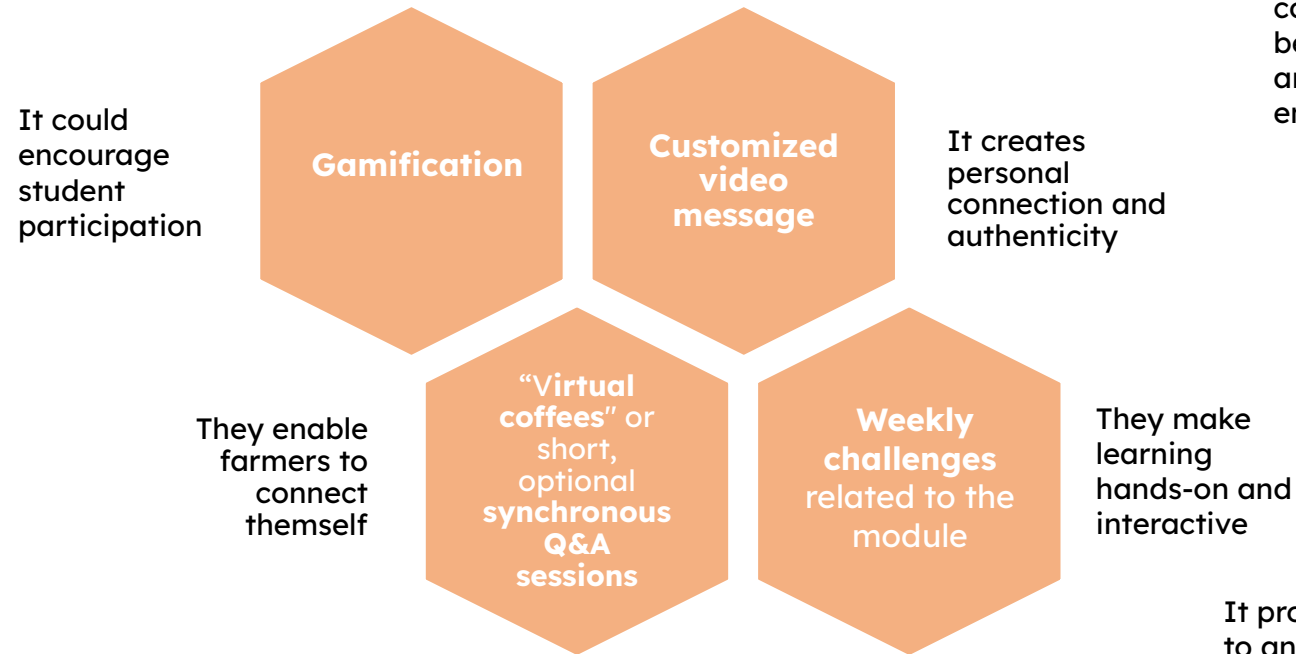


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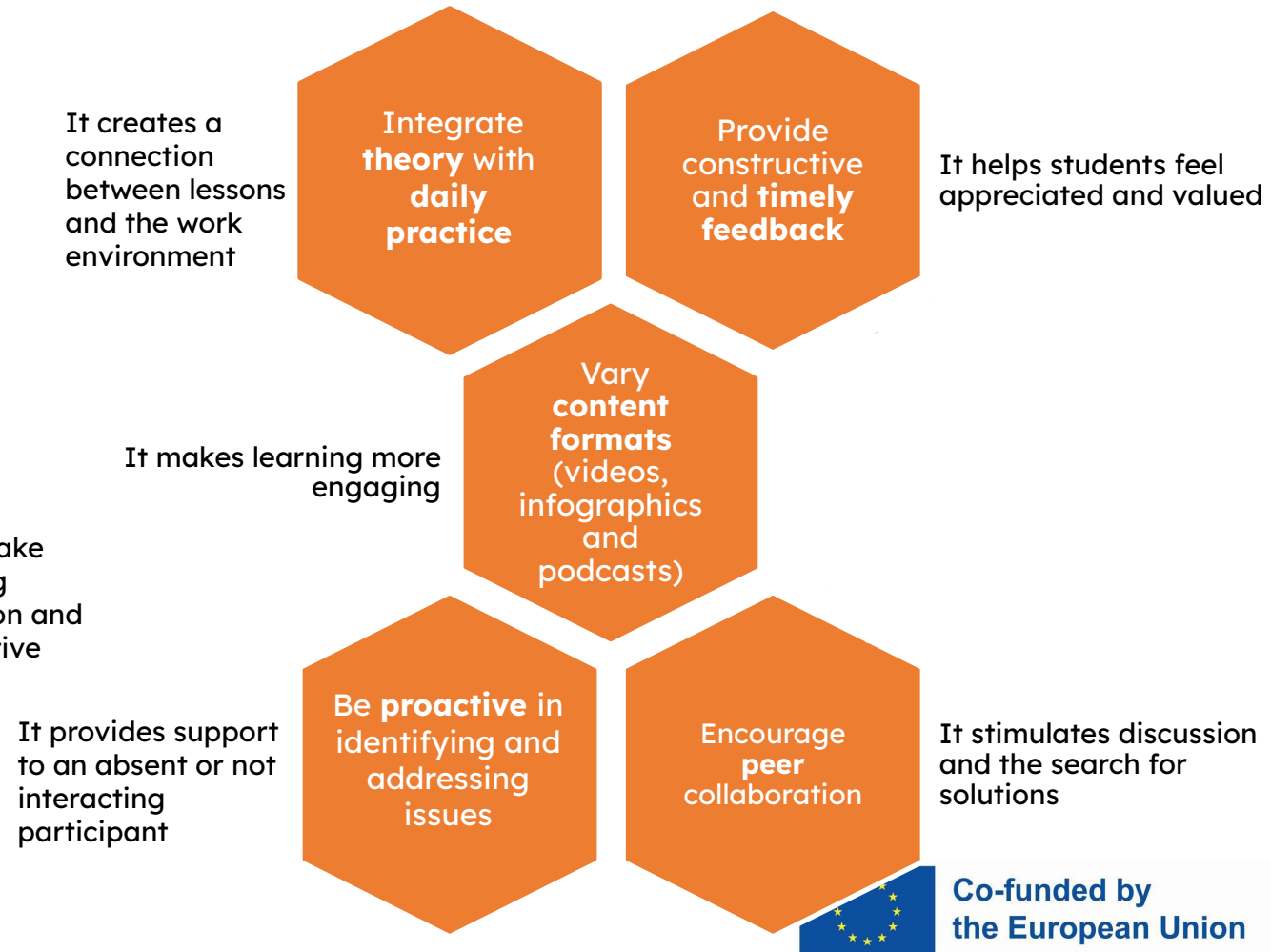
2.1.3 Main differences between in-person and remote mentoring, the role of facilitator and the importance of participant engagement



Examples of communication tools:



Examples to improve student participation and learning:



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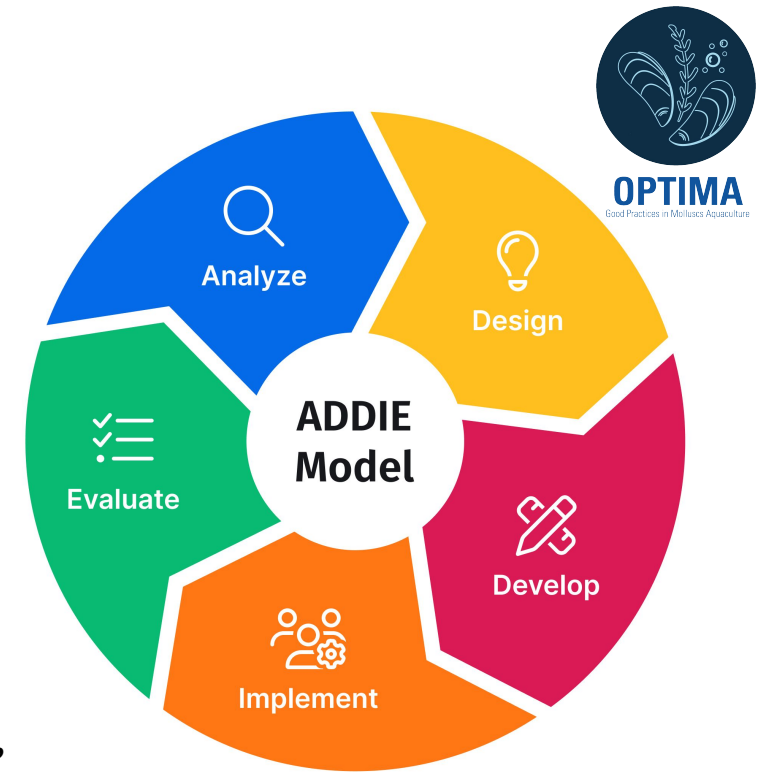
2.1.4 Pedagogies associated with distance learning: AGILE, ADDIE, etc.

ADDIE model: represents the five phases of the creation, delivery, and evaluation process: **Analysis, Design, Development, Implementation, and Evaluation.**

- **Analysis** phase: data collection on the recipients, their learning needs, the skills to be developed, the available resources, and the objectives to be achieved are defined.
- **Design** phase: the training program is planned in detail, clear and measurable learning objectives are established, the content is structured into modules and lessons, and appropriate teaching methods, support tools, and assessment criteria are chosen.
- **Development** phase: production of materials including handouts, slides, videos, quizzes, simulations, and e-learning platforms, which are then tested for quality.
- **Implementation** phase: delivering training in which lessons, workshops, or online activities are organized. Support is provided to mentors and participants, and the effectiveness of the delivery is monitored.
- **Evaluation** phase: cross-cutting process, where data are collected to assess learning, participant satisfaction, and the impact on the application context, allowing for potential improvements.



This approach ensures a **rigorous structure** and **ongoing evaluation**, ensuring that the training material is well-structured and aligned with the learning objectives of the course.



- ✓ **Flexible**
- ✓ **Cyclical**
- ✓ **Adaptable** to different settings (schools, universities, corporate training, and digital learning)

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2.1.4 Pedagogies associated with distance learning: AGILE, ADDIE, etc.

ADDIE course example

Sustainable Management of Bivalve Molluscs Farming

1. Analysis

Audience: bivalve farmers (mussel or oyster farmers), with varying levels of experience.

Training needs: Updates on environmental regulations, water quality monitoring techniques, sustainable management of facilities and resources.

General objectives: Improve productivity while reducing environmental impact.

Constraints: Seasonal working hours, limited time availability, variable digital literacy levels.

2. Planning

Specific objectives

Participants will be able to:

- Identify water quality parameters.
- Apply good facility maintenance practices.
- Know industry regulations.

Structure: Modular course, 4 modules:

- Regulations and food safety.
- Water quality and monitoring.
- Sustainable farming techniques.
- Waste management and environmental impact.

Methodology: online lessons + guided facility tours + demonstration videos + real-life case studies

Evaluation: End-of-module assessment questionnaires, practical tests.

3. Development

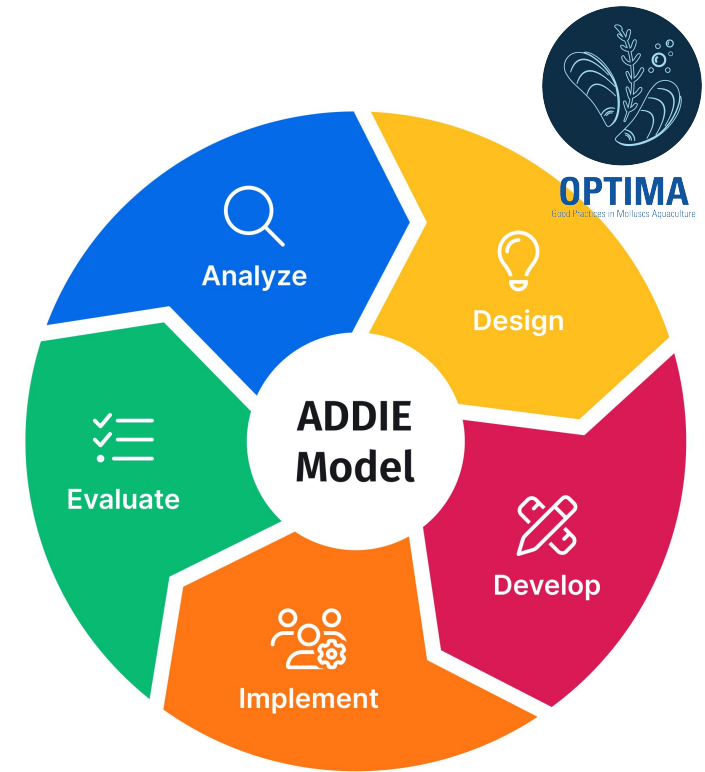
- Production of slides, technical sheets, and video tutorials on best practices.
- Creation of operational checklists.
- Preparation of monitoring kits for use in exercises.

4. Implementation

- Organization of in-person/online sessions in cooperatives or research centers
- Monitoring of participation and personalized support.

5. Evaluation

- Collecting feedback through satisfaction questionnaires.
- Verification of skills learned through practical exercises.
- 3-month follow-up to evaluate the application of the techniques learned.



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2.1.4 Pedagogies associated with distance learning: AGILE, ADDIE, etc.

AGILE model: derived from the world of software development, it emphasizes **interaction, flexibility, and adaptability**.

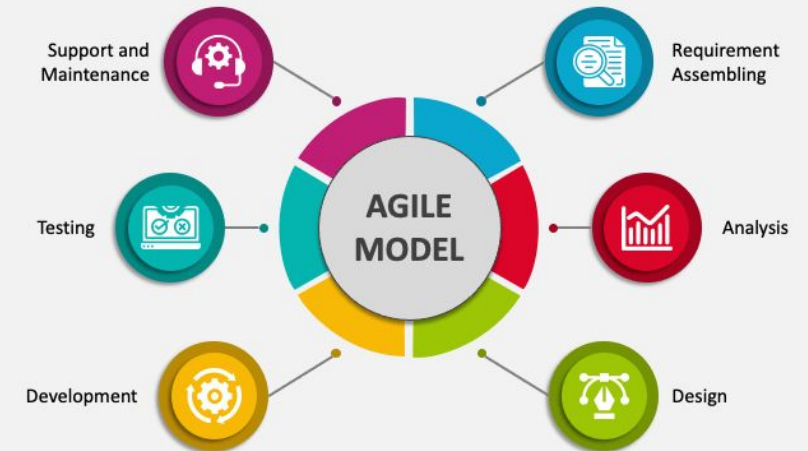
- Complementary or alternative to ADDIE.
- It focuses on **short development cycles** and **continuous feedback**, allowing for rapid changes to content and teaching strategies based on emerging needs.
- This approach is particularly advantageous in **dynamic contexts** or when rapid refinement of materials is required.

Connectivism model: emphasizes the creation of knowledge networks through digital resources.

Problem-Based Learning (PBL) model: encourages students to solve complex, real-world problems, promoting critical thinking and the practical application of knowledge.

AGILE MODEL

Agile Model Development Phases



The choice of model depends on:

- course objectives
- student profiles
- available resources

Integrating multiple approaches can maximize the effectiveness of distance learning.



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2.2 Understanding the different platforms for online training and their functionalities

The digital age has transformed the way we learn and train, making **online training** an **irreplaceable** component in both academic and professional settings



Mentors: it is essential they **know how to navigate** the different **e-learning platforms**, allowing them to better guide learners and choose the most effective solution for each specific training need.

2.2.1 Online training platforms

1) Learning Management Systems (LMS)

It is a software platform specifically designed to

Manage

Distribute

Track

Online courses and training programs

They are real **communities** where mentors can create structured courses on the most diverse topics. They are the most complete online training platforms.



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MODULE 2

2.2.1 Online training platforms

Main characteristics of LMS:

- ❖ **Organize and distribute educational content:**

you can upload and structure courses, modules, videos, documents, presentations and interactive quizzes. This content can be used by students independently and at their own pace (e-learning) or as a support for in-person lessons (blended learning).

- ❖ **Manage users**

LMS allows you to enroll and unenroll students, assign roles (student, teacher, administrator), create learning groups and manage user profiles.

- ❖ **Track progress**

LMS monitors student activity: what content they viewed, how much time they spent, the results of quizzes, progress in training paths. This is essential to evaluate the effectiveness of training and identify any difficulties.

- ❖ **Evaluate learning**

LMS allows you to create and administer tests, quizzes, assignments and other forms of assessment. It often offers automatic grading systems and the ability to issue certificates upon completion of courses.

- ❖ **Facilitate communication and collaboration**

Many LMSs include communication tools, such as discussion forums, chat, internal messaging, and sometimes even synchronous virtual classroom capabilities, for live sessions between teachers and students.

- ❖ **Generate reports and statistics**

LMS can provide detailed data on platform usage, student progress, and course effectiveness. These reports are valuable for administrators and trainers to continuously improve training programs.



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2.2.1 Online training platforms

2) Massive Open Online Courses (MOOCs)

These are **university** or **higher education courses**, made available **online** for free or at low cost, and open to a potentially **unlimited number of participants** from all over the world.

Main characteristics:

- ❖ **Massive:** they are designed to accommodate a very large number of participants, from hundreds to hundreds of thousands of students at the same time.
- ❖ **Open:** access to courses is generally free and open or low-cost. There are no specific admission requirements (such as previous qualifications), except in some cases a basic knowledge of the topic or language of the course.
- ❖ **Online:** the entire course is delivered via the internet, allowing the use of teaching materials, lessons and activities from any place and at any time.
- ❖ **Courses:** they are structured as real courses, with a well-defined program, teaching materials (video lessons, readings, handouts), exercises, quizzes, often discussion forums for interaction. At the end of the course, in many cases, it is possible to obtain a certificate of participation or completion, sometimes for a fee, which attests the skills acquired.



Dedicated platforms such as Coursera, edX, FutureLearn, Udacity, Federica.EU, EduOpen, etc.

MODULE 2

2.2.1 Online training platforms

3) Webinar and live streaming platforms

- ❖ Perfect for real-time training sessions on specific topics.
- ❖ They offer direct interaction and the possibility of doing Q&A.
- ❖ There are also tools dedicated to the creation and sharing of multimedia content (video tutorials, gaming), often integrable within the LMS.

4) Platforms for quizzes and surveys

- ❖ Very useful for verifying learning and collecting feedback from students. Knowing this information will help the mentor choose the most effective tool to train their target group.

2.2.2 How to choose the right platform? Factors: cost, functionality, ease of use



Cost

- Purchase price
- Subscription fee
- Maintenance
- Technical assistance
- Integration with other systems
- Need for customizations

A thorough cost-benefit analysis is necessary to ensure the economic sustainability of the project.



Features: the system must support all the planned teaching activities: upload and management of multimedia content, interactive learning tools, synchronous and asynchronous communication options and monitoring tools.

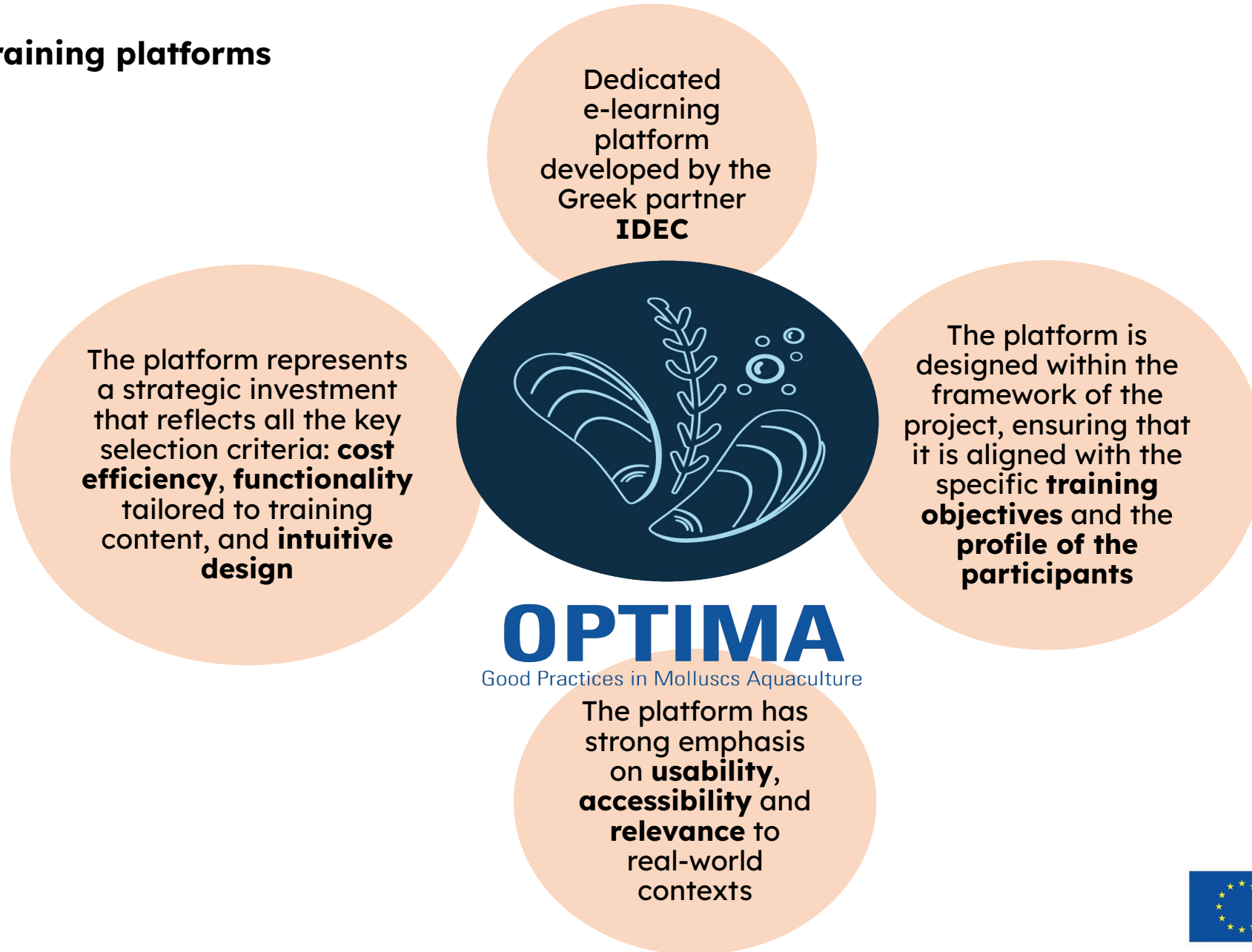
If the features are not used or are too complex, they become a burden rather than an asset.



Ease of use: a platform with an intuitive interface, clear navigation, and minimal technical barriers greatly enhances user satisfaction, allowing them to focus on the content rather than struggling with the tool.

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2.2.1 Online training platforms



MODULE 2

2.2.3 Main features: user interface, content management, communication tools, evaluation systems

LMS platforms are designed to optimize the distance learning experience and course management, offering a wide array of functionalities.



Pivotal elements:

User Interface (UI)

It must be clear, intuitive, and well-organized to facilitate navigation for both instructors and students and to make the platform immediately accessible and seamless.

Communication tools

Discussion forums, chat, internal messaging, and integrations with video conferencing platforms are indispensable for enabling interactions between students and instructors and building a sense of community.

Content management

A good LMS must allow for uploading, organizing, and presenting diverse educational materials in a structured and easily accessible manner. Also, the ability to create sequential modules and the option to create separate "rooms" for dividing students into working groups are crucial for fostering collaboration and active learning.

Assessment systems

They are crucial for monitoring progress and learning effectiveness. These include the creation of multiple-choice quizzes and open-ended questions, the ability to upload assignments, assign grades, provide personalized feedback, and track detailed student activity.



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2.2.4 Examples of LMS platforms: Moodle, Canvas, Google Classroom



Moodle, one of the most popular open-source platforms in the world. It is highly customizable and scalable, suitable for different needs, from small organizations to large universities. It offers a wide range of additional modules and plugins that extend its functionality, allowing it to be adapted to specific contexts.



Canvas, developed by Instructure, is a cloud-based LMS known for its modern, clean and intuitive user interface. It is particularly appreciated for its reliability, robust communication and collaboration features, and integration with external tools. Canvas is often the choice of educational institutions and companies looking for a complete and user-friendly solution.



Google Classroom is a simpler platform and integrated into the Google ecosystem. It is ideal for basic course management, document sharing, assignment and communication through announcements and streams. Its strength lies in its ease of use and native integration with Google Drive, Docs, Sheets, etc., making it a popular choice for K-12 education and less complex training courses.



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2.3 Knowing how to adapt the training materials to the distance/online training and adopting multimedia tools to enrich educational experience

We will explore methodologies to effectively deliver the OPTIMA training program **remotely**



The goal is to develop **innovative teaching strategies** that make distance learning not only more accessible, but also enjoyable and engaging for students



Compensate the physical distance by enriching the educational experience with diversified **multimedia tools**: videos, audio, infographics and simulations will become crucial to maintain high attention and facilitate the understanding of complex concepts.

2.3.1 Use of engaging content: texts, videos, audio, infographics and storytelling techniques

To maximize the effectiveness of distance learning & maintain a high level of student engagement; it is essential to use a variety of stimulating multimedia content:

- Explanatory videos
- Audio, such as podcasts or interviews with industry experts
- Infographics to summarize complex information
- Storytelling techniques to contextualize the theoretical notions through practical examples.



Short videos will be produced in each country involved in the OPTIMA project that show real practices and processes in aquaculture



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2.3.2 Using interactive activities: quizzes, discussions, games, hands-on exercises to encourage active learning

To promote meaningful engagement and deeper understanding of concepts, it is essential to regularly integrate interactive activities:

- **Quick quizzes, multiple choice or fill-in-the-blank:** strategically distributed throughout the lessons, allows for real-time understanding and to consolidate concepts.
- **Online discussions:** facilitated through forums or dedicated chats, encourage the exchange of ideas, the comparison of experiences and the collaborative construction of knowledge.
- **Educational games or simulations:** can make learning fun and engaging, turning complex concepts into simple ones.
- **Practical exercises,** even if virtual or scenario-based, are crucial to encourage the application of acquired knowledge. These could include case study analyses, solving specific problems related to aquaculture, or simulations of operational processes, where students are the protagonists of their learning journey.



Example of possible quiz for bivalve farmers:

You notice a sudden increase in mortality in your clam farm after a windless summer heatwave. What is the most likely cause you should check first?

1. A bacterial disease.
2. **An anoxic crisis (lack of dissolved oxygen).**
3. Excessive salinity of the water.
4. Predation by crabs.

To effectively protect a mussel farm from predation by sea bream, which strategy is most effective in the long term?

1. Use acoustic deterrents.
2. Introduce a natural predator of the sea bream.
3. Increase surveillance with boat passages.
4. **Install anti-predation nets (socks) around the awns.**

You are evaluating a new site for an oyster farm. What is the first, fundamental parameter to check to ensure that the product is marketable for direct human consumption?

1. The abundance of phytoplankton.
2. The depth of the seabed.
3. The distance from the nearest port.
4. **The health classification of the production area.**



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MODULE 2

2.3.2 Using interactive activities: quizzes, discussions, games, hands-on exercises to encourage active learning



Example of possible quiz for bivalve farmers:

While monitoring, you detect the beginning of an algal bloom of a potentially toxic species near your facility. What is the most correct and prudent action to take immediately?

1. Harvest all saleable products immediately.
2. **Suspend harvesting and intensify sampling of bivalves for biotoxin analysis.**
3. Ignore the phenomenon, as many algal blooms are harmless.
4. Add nutrients to the water to encourage a non-toxic competitor algae.

Which of the following is the first indicator that a farmer can observe directly in the field that suggests the risk of contamination by marine biotoxins?

1. **A decrease in the filtration rate and the production of pseudofeces by bivalves.**
2. A slight increase in water temperature.
3. The presence of foam on the surface during storm surges.
4. A change in the color of the water, which tends to reddish or brown.

An analysis detects the presence of DSP (Diarrhetic Shellfish Poisoning) toxins in your farm. What is the main risk to public health associated with the consumption of contaminated bivalve molluscs?

1. Allergic reactions and anaphylactic shock.
2. Muscle paralysis and difficulty breathing.
3. **Severe gastrointestinal disorders such as diarrhea, nausea and vomiting.**
4. Neurological symptoms such as dizziness and memory loss.

After a closure due to biotoxin contamination, what is the essential requirement to be able to reopen an area for harvesting and marketing?

1. The return to normal growth rates of bivalves.
2. The disappearance of the abnormal coloration of the water.
3. A waiting period of at least two weeks from the end of the algal bloom.
4. **Two consecutive samplings, at least 48h apart, with results below the legal limits**

What management practices can help a farmer mitigate the economic impact of a toxic algal bloom?

1. **Diversify farmed species and production areas.**
2. Use chemical treatments to kill toxic algae.
3. Increase bivalve density to maximize production before bloom.
4. Move the entire farm to deeper water during bloom.



MODULE 2

2.3.3 Microlearning: dividing content into micro-lessons to encourage learning

What is it?

Innovative and highly effective teaching strategy, particularly suited for instructors training professionals in the bivalve aquaculture sector.

How does it work?

Breaking down training content into "micro-lessons," short, focused learning units that address a single concept or specific skill at a time.

Benefits

This approach offers mentors the opportunity to design more streamlined, modular, and easily updateable courses; meeting the needs of bivalve farmers, who have flexible schedules, limited time, and need to access content "just-in-time."

Content

Micro-content can be short videos, infographics, short quizzes, or practice sheets for direct consultation in the field.



Bivalve farmer sector:

requires **continuous updates** on health regulations, sustainable management techniques, water quality control, food safety, and awareness of the ecosystem services provided by this type of farming.



Microlearning allows for the provision of readily available, easily digestible training pills that can be immediately applied to everyday life.

MODULE 2

2.3.3 Microlearning: dividing content into micro-lessons to encourage learning

Industry mentors must rethink the structure of traditional courses, identify key areas of knowledge and transform them into short, concise, self-contained modules, distributed on a digital platform.



Student benefits:

- ✓ Better course completion rate.
- ✓ Greater interaction with farmers, thanks to “snackable” content, i.e. also shareable on messaging apps or social networks within the community of practice.
- ✓ Rapid updating of teaching materials based on regulatory and scientific developments.

Examples and links for further information:

FAO Elearning Academy: Free online courses on improving the safety and quality of bivalve molluscs. [Go to the course](#)

WorldFish e Learn.ink: Mobile-First Microlearning Examples for aquaculture mentors. [Read the case study](#)

Arist: Mobile-First Microlearning Examples for Aquaculture Trainers. [Learn more](#)

Learn more:

[Shift eLearning – Why Microlearning Works](#)

[LinkedIn – 10 Benefits of Microlearning](#)



MODULE 2

2.3.4 Cooperative learning: the importance of creating sub-rooms by dividing the class into subgroups to encourage the exchange of ideas and problem solving or to do exercises

Cooperative learning stimulates **active interaction**, **participation**, and **exchange** among students , even from shy or hesitant students.

Mentors transform online lessons into true laboratories for **discussion** and **co-construction of knowledge**.



Virtual sub-rooms

Many video conferencing platforms allow a large virtual class to be divided into small subgroups, creating "alternative rooms" to which the mentor can assign different tasks.



Bivalve farmer sub-rooms could tackle the following topics:

- ❑ case study analysis;
- ❑ sharing best practices between farmers from different areas;
- ❑ simulations of production improvement or sustainable management plans;
- ❑ resolving problems related to contamination or disease.



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MODULE 2

2.3.4 Cooperative learning: the importance of creating sub-rooms by dividing the class into subgroups to encourage the exchange of ideas and problem solving or to do exercises

Mentors act as **facilitators**:

- Monitoring the groups
- Periodically moving from sub-room to sub-room
- Intervening with targeted clarifications
- Enhancing the ideas that emerge

At the end of this activity, the class gathers to share the results of each subgroup with all the other students, comparing the solutions found and drawing shared conclusions.

Cooperative learning reinforces the learning of technical and scientific content as well as develops **transversal skills**:

- ✓ It allows for effective **communication**, for better understanding between farmers and stakeholders.
- ✓ It facilitates **teamwork**, essential for managing complex facilities.
- ✓ It stimulates **problem-solving**, useful for addressing the challenges associated with bivalve farming.



THANK YOU!



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