Work Package 2:
Training architecture and resources

Deliverable D2.1.
Methodological framework

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ABSTRACT	Methodological framework presenting the objectives, deliverables and main activities of the WP2, training architecture and resources. The pedagogical tools described in this document were designed to be implemented in 5 European countries during the project experimentation.
KEYWORDS	MOOC, Textbook, learning objectives, framework, partnership, online learning, Artificial Intelligence.

Dissemination level		
PU	**Public**	**X**
PP	Restricted to project partner (including the Commission)	
RE	Restricted to a group defined by the consortium (including the Commission)	
CO	**Confidential, only for members of the consortium (including the Commission)**	

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Introduction

This document is an update on the methodology and main activities of the work package two, facing the large-scale experimentation to be implemented from November 2022 until mars 2023.

The activities that are described have been led by the University of Nantes and Inria with a very important contribution of the LORIA, which was assigned additional activities beyond the initial tasks for this work package.

This framework is an internal document which will describe the following:

1. Proposal objectives and updated objectives
2. Deliverables
3. Contents and learning objectives
4. Hosting platforms

1. Objectives

In the proposal three general objectives were proposed (O1, O2, O3). The meetings in WP2 during the period March-July 2021 allowed the emergence of 2 other objectives (O4 and O5).

1.1.   Grant application general objectives:

1. To help teachers with their usual professional practices and reflective approaches on the ethics and culture of the associated data. The latest International Conference on Artificial Intelligence in Education has notably addressed the subject in one of its workshops, but resources are lacking. AI4T will create blended learning activities to cover the subject.

2. To promote the use of digital educational resources in real classroom situations to appreciate, correct and evaluate. The aim is to avoid that well-constructed ergonomic and marketed solutions encourage teachers and their students to use AI without full awareness and understanding. This has not been researched yet. A blended approach will be used to cover this aspect.

1.2.   Specific objectives:

O1   To give teachers a basic to solid culture about AI allowing them to become first-class citizens as far as understanding AI, how it works, the challenges and consequences.

There are pre-existing resources for that. The consortium has specifically identified the French Class'Code IAI MOOC and has decided to use it as a baseline to deliver a MOOC in the languages of the participating countries. This MOOC will comprise adapted and new modules dedicated to use cases related to teaching.

O2   To help teachers with their usual professional practices (differentiating according to the needs of students or groups of students, coaching and training, evaluation, selection of resources, etc.) and reflective approaches on the ethics and culture of the associated data. Some papers have been written on the subject, but challenges remain, and resources are lacking. The consortium will create blended learning activities to cover the subject. Consequently, there are no pre-existing training resources. A blended approach will be used to cover this aspect.

O3   To promote the use of digital educational resources using AI bricks in real classroom situations to appreciate, discuss, correct and evaluate their interest, from the point of view of educators, service providers and researchers.

The aim here is above all to avoid that well-constructed ergonomic and marketed solutions encourage teachers and their students to use AI without full awareness and understanding. This domain has not been researched yet.

1.3.   Added specific objectives (2021)

O4   To allow teachers to be aware of the indirect effect of AI on education

This objective emerged through the many discussions which took place in the project. To give some examples:

- In language teaching, the impact of automatic translation tools is external. They are rarely used in the classroom, yet they have a profound influence on how the pupils work at tome. It even has an impact on the motivation for the topic.
- In literature, the impact of GPT-3 technologies is still to be measured but the reactions in 2022 are already that many usual activities (writing essays) will have to be revisited
- In mathematics or computing, tools allowing to access solvers through natural language will necessarily need teachers to modify the way some topics are taught
- Exams during COVID have been affected with many cheating issues. As analysed during this project, the actual definition of what is cheating needs revisiting.

O4 is how AI is going to impact education independently of the action taken by the teacher. For example, data driven AI is going to create models which are just approximations of the truth (one can think of a weather prediction which is accurate but not exact and can sometimes make errors). The question here is not so much how to profit from AI tools to be a better teacher, but rather how else is AI going to transform the teaching task. New challenges may appear. O4 is about discussing these issues. There are probably no definitive answers but being able to understand what AI can do and will be able to do in the foreseeable future may allow better.

O5 ➡️ To understand the ethical challenges and discussions around the use of AI in education.

Ethics is becoming a challenging question when it comes to AI. Typical issues concern transparency and intelligibility. European guidelines and GDPR will also be considered.

2. Deliverables

There are 5 deliverables in WP2:

- D2.1. Methodological framework
- D2.2. Synthesis on AI in Education
- D2.3 Template for AI characterization
- D2.4 MOOC
- D2.5 Training resources

D2.1 The Methodological framework

A first version of this framework was produced and discussed from July 27th, 2021, onwards. It can be found as an online document here:
https://3.basecamp.com/3727392/buckets/22492437/documents/5340515731

D2.2 Synthesis on AI in Education

This deliverable was expected to be finished before the implementation of the large-scale experimentation. However, some obstacles prevented delivery; therefore, its methodological objective has changed. This document focuses, for now, on how AI support teachers' practices and it could allow partners and other European stakeholders to have a view on useful resources for teachers.

In D2.2 some AI tools supporting teachers' job were introduced, but this part of work should belong to the "Template for AI characterization" (D2.3). The resources and tools deemed worth sharing and possible to adapt will be described in a repository for later use during the large-scale experimentation. To help ministries doing so, the University of Lorraine will draft a report on potential inputs of AI to education in terms of practices and pedagogical scenarios.

D2.3 Template for AI characterization

Together with the ministries, the University of Lorraine's LORIA has characterised AI in pedagogical tools and listed vigilance points. The result will be a template dedicated to teachers, although the template can be modified to suit other cases following the same methodology. This was produced by Loria as "report on the requirement of collection data.pdf"

It can be found on Basecamp:
https://3.basecamp.com/3727392/buckets/22492437/uploads/5156016898

This document was also based on analyses of different licences produced by publishers:
https://3.basecamp.com/3727392/buckets/22492437/vaults/3882303385

D2.4 MOOC

This deliverable was overseen by the partner Inria. There were 3 successive deliveries:

MOOC V0 (June 2021):

MOOC "Intelligence artificielle avec intelligence" (Class'Code / Inria) in order to reach the O1 objective "to give teachers a solid culture and understanding of AI. In English"

MOOC V1 (September 2021):

Iteration on the MOOC V0 for the pilot phase in English.

MOOC V2 (October 2022):

Second literation for the large-scale experimentation phase. In English, French, German, Italian and Slovenian. Access to the resources of the MOOC on github: https://github.com/inrialearninglab/ai4t/tree/main/docs

NB:

A possible MOOC V3 would be made before the end of 2023. A third iteration would be delivered for the dissemination phase based on the feedbacks and outputs from participants to the experimentation and the partners. Its content will depend on the quality and quantity of those contributions.

D2.5 Training resources

Complementary resources to the MOOC have been discussed to fulfil objectives 2, 3, 4 and 5. This methodological choice was taken after the implementation of the pre-scale phase, to give teachers a wider panel of tools.

A training pathway has been created and led by the work package 1 leaders. It gathers all information related to the full-scale experimentation in each country (date, modalities, content, use of the MOOC and textbook, technical contact). The document is available on Basecamp: 2022-09-30 AI4T_Training pathway.docx (basecamp.com)

In addition to the MOOC, are also hosted on the GitHub repository, in 5 languages:

- The presentation of the AI educational tools used by every partner during the large-scale experimentation phase
- A bibliography on the project (the use of AI in education, its implication on teaching and learning, its ethical concerns) that will be updated until the end of March 2023.
- The review of MOOCs on AI and education (updated in December 2022)
- The presentation of the SELFIE project
- And also: According to what will be shared by partners at the end of the large-scale experimentation phase, the activities and contents of the training sessions could be hosted in the Github repository as training resources

Finally, the methodology of two of the substantial methodological inputs to the project will be shared during the dissemination phase:

- The use of a GitHub repository has a collaborative way of creating, maintaining and curating contents for online training in Education (it also allows a dynamic implementation of contents on LMS – like on the Fun-MOOC or Fun-campus platform, both based on edX)
- The methodology used to provide the textual contents of the MOOC in 5 languages (use of "markdown" language, preparation of the .md pages for a relevant use of machine translation, use of the DeepL API to generate the texts in 4 other languages, "external review" of the translation (cf. bibliography, images), validation / improvement by native speakers ie. partners).

The following resources are also to be prepared:

An interactive open textbook, prepared by the Nantes University partners as complementary pedagogical material with the contributions of the LORIA as well as other consortium partners as the Italian Ministry, the CNRS, the Irish ministry and feedback from the consortium partners. The first version was ready for the 31st of October in English.
Translation in other languages will be shared before the end of 2022.

- [AI for Teachers (usc.edu)](usc.edu)
- Sharing: the material has been prepared in order to be shared openly under an open license. Because the project needs an evaluation with a control group, the textbook will be disseminated only after the experimentation scale.

The ministries are building teaching activities with the delivered material.
- Partners are organizing live sessions and webinars during the full-scale experimentation phase.

3. Contents and Learning Objectives

The learning objectives are more concrete and aim to help teachers progress. The MOOC and the textbook were created to respond to the five objectives mentioned above. In doing so, the following contents for each tool allow the proper evaluation of the impact and progress of the objectives of this work package.

The live sessions were discussed differently as every country need to adapt the content to the specificities of the teachers in the participating countries. To provide a common framework for the evaluation of its impact, learning objectives were agreed during thematical workshops on this aspect.

3.1.   MOOC Contents

The MOOC V2 starts with a general presentation that intends to explain and engage teachers in the self-training based on the MOOC created by the project. It also helps to situate the project in a European framework, and to present the content, objectives and organisation of the MOOC.

This introductory section explains how to use the resources, the purpose of data collection and GDPR compliance and the grant and funding quotation.

Based on the feedbacks from the pilot phase, the course includes 4 modules:

The Module 1 "Using AI in education" will allow teachers to:
- Illustrate the general concern about AI in education
- Raise questioning in each teacher's own practices with a simple interactive activity
- Point out the AI-related challenges in education and core competencies required in the AI era.
- Discover the functionalities of some tools for experimentation

The Module 2 "What is meant by AI?" content round on the following aspects:
- What AI is really, its potential and limitations for education
- Present the diverse definitions of AI and its scientific fields
- Experiment the basics of AI and its limitations
- Explain where AI comes from
- List the bricks at the origin of 3 AI-based applications: Natural Interaction, Image Recognition and Autonomous Car.
- List the existing AI techniques, what are their potential or existing uses in Education

The Module 3 "How does AI work?" aims to:
- See how AI works
- Get a first understanding of AI types
- Identify AI approaches and how they relate to each other
- Get a first understanding of what are data and how they are used.

- Experiment how machine learning and program training works and test the importance of properly prepared data sets.

Understand how does an artificial neural networks work?
Identify the different biases risks

<u>The Module 4 "AI at our service as teachers?"</u> intends to allow teachers to:
- Understand how decision-making tools change practices or can improve them and have to be questioned
- Understand what can be done with AI raising feasibility and ethics issues (questioning)
- Understand the impact of using decision-making AI tools and the necessary precaution of use
- Be aware that too many tools can lead to a mental overload (for AI as for all digital tools)
- Identify some specific AI software for use in Education
- Use of the Template for AI Characterisation to analyse an AI software tool

The concluding part of the MOOC is dedicated to:
- Presentation the future of education (an interview with one of the project promoter - Alain Thillay).
- Introduce the Textbook.

3.2. Textbook

The textbook is presented in 6 modules whose objectives are linked to the general work package aims. Therefore, the following description of its content reflects this purpose.

<u>Module 1 "Why Learn About AI"</u>
Lays out the reasons for learning about AI, along with a brief introduction to AI and the historical timeline of AI techniques. The reasons address both those who are afraid of AI and those who are convinced of its advantages.

<u>Module 2 "Finding Information"</u>
Addresses search engines, available options and settings, and a brief overview of how search works. Behind the Lens touches on the ethics of search and the business model of search engines.

<u>Module 3 "Managing Learning"</u>
Starts with the 2 common examples of Moodle with ML add-ons and Google Classroom: on to LA, EDM and scheduling and then the technical and ethical aspects of data handling.

<u>Module 4 "Personalising Learning"</u>
Starting with the general idea of personalisation and technology assisted personalised learning, we take up ALS (mostly ITS) and then use Youtube recommenders and models to explain how an ALS works. The flip side of ALS discusses some potential problems of overuse thus leading to collob. Learning which includes clustering.

Module 5 "Speaking, Listening and Writing". Language is something which AI is getting good at. And language is also a key element in education. This module explains why AI is good at language and visits a number of language linked tools whose impact on education is important.

Module 6 "The Next Steps"
Can AI play a creative role?
AI going to change the way we teach?
How to convince parents and collaborate with them

3.3.   Training resources: Live sessions, Webinars (co-created with WP1)

Reminder: Objectives of the training sessions as defined by WP1
At the end of the large-scale experimentation, the project expects that teachers will be able to:

1. Being able to express ones understanding and attitude towards AI and discuss it
2. Being able to understand the basic principles of AI system
3. Being aware of AI educational applications and key considerations when identifying, assessing and selecting their AI for teaching, learning and assessment
4. Being aware of legal considerations when using AI in educational setting
5. Being aware of ethical considerations when using AI in educational setting
6. Being aware of generic AI tools and being able to reflect on their impact on education to critically consider the possibilities for AI tools on the education (new outcome)

4. Hosting platforms

4.1. MOOC

During all the project's life, the MOOC resources are delivered to partners on a Github repository. It's possible to visualize and browse through its content in 5 languages (no authentication is needed – during the experimentation phase, partners were asked not to share this link outside the consortium in order to protect the evaluation protocol:

https://inrialearninglab.github.io/ai4t/index.html

All the MOOC contents can be downloaded at the following address:
https://github.com/inrialearninglab/ai4t

In addition, the following elements were shared with partners to help them make the most of the MOOC resources for their national large-scale experimentation phase: https://public.3.basecamp.com/p/RmoY6KjvEXEWASY7wCSMrP8V

A collaborative workflow on Github was proposed to partners to review the MOOC contents in every language with two aims:

1. **Validate the translation of contents** in the 5 languages (contents in English were machine translated to French, German, Italian and Slovenian with DeepL then partners were in charge of reviewing the proposed translation and improve it when needed)
2. **Adapt the contents to local context**: localisation was planned in the project application form in order to better fit the national teaching context.

Workflow tutorial:

The Inria team provides support (general technical meetings, mail and conference call discussions for specific needs) to partners when required in order to facilitate the national implementations.

The workflow tutorial is available at the following address:

https://docs.google.com/document/d/1X9X30SuBSK0WNduSOmr1up5OjCzDrXzX/edit?usp=sharing&ouid=102222241005750199876&rtpof=true&sd=true

For the Large-Scale experimentation phase

Taking the feedback from the pilot phase and following the discussion during the technical meeting of this work package, partners agreed to use the following platforms to host the MOOC V2:

	Italy	France	Luxembourg	Slovenia	Ireland
Hosting platform for the MOOC (and/or other resources)	Moodle (CNR)	Fun Campus (Access with ID / Only recruited teachers can access to the resource)	Moodle (training delivered on two platforms in line with the Luxembourg bilingual status: one platform in French and one in German.	Moodle	Teachers training national Moodle platform

National measures are being taken to allow the collection of traces in each platform.

For the dissemination phase, the application form mentioned a MOOC in 5 languages hosted on a European Platform. The dissemination strategy on this matter will depend on the relevant European platforms available.

Access to the MOOC resources will however be possible after the large-scale experimentation phase:

- On the GitHub repository dynamic webpages
- On the AI4T.eu website

4.2. Textbook

The textbook is hosted on the AI4T website: https://www.ai4t.eu/book/. The textbook will be available in German, Slovenian, Italian and French on the same platform.

Access details:

https://ai4t.eu/book/
Sign in name: chaireunescorelia@univ-nantes.fr
Password: 12345