

Work Package 1 - Experimentation

Deliverable D1.1- Experimentation Framework

Full scale



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1. Introduction

Foreword

The present document is an updated version of the initial document “Experimentation Framework Pilot Phase”. It incorporates the common elements and contractual guidelines, takes into account the results and the lessons learned of the pilot phase and sets the parameters under which the large-scale experimentation phase is mostly likely to succeed, providing guidance and support.

1.1 Theoretical background

On a daily basis, it is possible to find the media displaying information on an aspect of our lives that has to do in some way with the use of application based on Artificial Intelligence. If a State gets to the point of arresting a robot charging it with suspected intelligence activities¹, then it is obvious that the notion that wants AI and human machine interaction being a “thing of the future” is buried in the past. Of all the possible applications of AI, AIED (Artificial Intelligence for Education) is a relatively novel research field, the more so with the European continent, where very few experimentation programmes have been set, at least at a systemic level. Therefore, the amount of research on the subject is not massive and, for most part, quite recent, whereas Artificial Intelligence applied to other fields, such as medicine, economics, trade, and so on., can count on a much longer research history and a consistent number of studies, in many cases revised over the years.

The history of research in education dates to very recent years and is based on a limited experimentation carried out in the class. To this extent, it is crucial to obtain a picture portraying the state of the art of the overall perception, knowledge, and awareness of the aspects of teachers’ professional practices related to Artificial Intelligence.

1.2 Objectives

The project proposal presented in September 2020 and later approved by the Commission had identified three macro-objectives:

1. To give teachers a basic to solid culture about AI. There are pre-existing resources for that. The consortium has 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.

¹ <https://www.theguardian.com/world/2021/oct/20/egypt-detains-artist-robot-ai-da-before-historic-pyramid-show>



2. 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.

3. 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.

The experimentation aims at investigating whether an on purpose designed training can be of any support for teachers to deconstruct their preconceptions, develop their knowledge and encourage an informed use of AI in a setting of teaching and learning. Through a randomised-controlled-trial, the experimentation is going to compare the evolution of knowledge, perceptions, and use of AI tools for education between a treatment group, which will receive a training, and a control group, which will only in part have access to some educational material and resources on AI.

Students represent the secondary target of the experiment. Teachers are eventually going to test some AI based resources in their classrooms.

The project is going to measure the impact of the teacher training on their perceptions and use of AI in the classroom. The main objective of this protocol is to ensure that all partners can advance regularly in taking all the necessary steps to complete the experimentation. It is very important that the planned activities, the procedure, and the evaluation are carried out with the same modalities, although respecting national differences in terms of bureaucratic, educational, political and cultural context.



2. Selection of schools and teachers

2.1 General guidelines

As pointed out in the project proposal, AI4T specifically targets maths, science (where the same teacher teaches both subjects) and foreign language teachers in charge of 15 to 17-year-old students. To favour a more coherent evaluation process, in those schools where math and science is not taught by the same teacher, the consortium has chosen to recruit math teachers. The foreign language targeted is generally English, with the sole exception of Ireland, where French language teachers shall be involved.

School directors shall be actively involved into the action carried out. Such involvement is to be considered crucial and highly strategic in view of a successful participation of the teachers as well as to evaluate the directors' management capacity when challenged with such an innovative perspective in educational terms.

As teachers' participation is voluntary, school principals will be informed of the project's objectives, and it is very important that they agree with the purposes and the actions in the first place.

In this view, an accurate process of communication is necessary: the school director in fact needs to inform their school communities about the procedures, the actions and the objectives of the experimentation in order to avoid whatsoever kind of oppositional stances by either teachers or students and their families. This is crucial to avoid defections during the experimentation, or any other issue related to data use and security.

2.2. Number of schools selected and criteria for selection.

As stated in the project approved by the Commission, the number of teachers involved in the small-scale pilot varied consistently compared to that of the large-scale experimentation. Also slightly different were the selection procedure and the phases of intervention. The small-scale phase was aimed at testing the tools and the participants' responses; therefore, no quantitative evaluation was carried out at that stage. Being the numbers very limited, the selection of schools happened by direct call. The sample for the experiment was not assumed to be representative of the general population of teachers. Ministries faced multiple issues during the pilot recruitment phase. A point of discussion was how to raise interest and provide a sort of reward for the teachers participating in the project.

In the large-scale experimentation phase ministries will do an extra effort in recruiting schools located in different areas and with heterogeneous social composition and will try to increase the number of dissemination activities.

Also, it will be made a more consistent use of the social media to promote the project (Twitter and LinkedIn)



2.2.1. Small-scale phase

The schools selected in this phase were slightly over 20:

- Italy 8 schools for a total of 39 teachers
- France 8 schools for a total of 20 teachers
- Slovenia 4 schools for a total of 24 teachers
- Ireland 2 schools for a total of 6 teachers
- Luxembourg 2 schools for a total of 6 teachers

The criteria and procedure of selection depended on individual choices taken by each ministry, not always the sample selected resulted to be representative for the randomisation criteria (general/vocational, rural/urban, % of disadvantaged students, location). Ministries have collected mainly the following information about the schools during the small-scale phase:

- location, type of school (vocational/general/polyvalent)
- number of volunteer teachers in the school.

But it was not possible to collect setting (rural/urban) and % of disadvantaged students in the school (or other criteria to assess the social composition of the school)

Additional information collected on teachers were:

- gender.
- age.
- subject taught

2.2.2 Large scale experimentation phase

In the large-scale experimentation phase, where a much larger number of schools should be selected, according to the project proposal, it was originally planned to have around 350 volunteer schools recruited by the Ministries among the 5 participating countries with the following ratio:

Initial forecast of volunteer schools (it might change during the course of the large-scale experimentation phase.

- 100 schools in France
- 100 schools in Italy
- 100 schools in Slovenia
- 30 schools in Ireland
- 20 schools in Luxembourg



From the very beginning of the large-scale implementation phase the above planned numbers have revealed quite challenging due to multiple reasons, among which overload of teachers' daily activities and concurrent trainings and formation paths.

The following “in progress” document will keep track of the progresses of the recruitment and the implementation of the large-scale implementation phase.

<https://3.basecamp.com/3727392/buckets/22492437/uploads/5639997800>

2.2.3 Involvement of teachers

In each school, at least 2 mathematics and 2 foreign language teachers with classes of pupils aged around 15 to 17 will be identified to participate in the experiment. The foreign language chosen is English, with the sole exception of Ireland where French teachers shall be recruited.

If the geographical and social localization of schools was of less importance in the small-scale experimentation, it will be very important to set precise criteria to define selection in the phase when ministries will have to issue a public call.

The school sample will have to be representative of the whole national territory: they shall have to be located both in urban and in rural areas. The schools located in urban areas shall have to represent both city centres and outskirts.

In countries where there is a difference between subjects taught, lyceum, professional schools and technical schools must all be represented.

Each ministry will issue a public call of interest within end of 2022. The results shall be elaborated by a commission appointed by the person responsible in the Ministry. The evaluation shall follow precise criteria, very similar to those followed for the selection of the schools during the small scale. The uniformity of geographical localization and social provenience shall be much more relevant in this phase.

Also the following elements will be taken into account for the randomization procedure during the large scale implementation:

- Region
- Type of schools (academic/vocational)
- An indicator of the social composition of the school
- The number of volunteer teachers
- Teachers' personal information (sex & teaching experience)

The criteria may vary from one country to the other depending on data availability and national contexts.



2.2.4 Involvement of school leaders

School leaders will favour and encourage the participation of as many teachers as possible to meet the required criteria. Each teacher will experiment in one specific class designated by their school leader. The involvement of school leaders is crucial and strategic in view of a successful participation of teachers and an active involvement of the students.

An accurate process of communication is necessary: the school director in fact needs to inform their school communities about the procedures, the actions, and the objectives of the experimentation to avoid whatsoever kind of oppositional stances by either teachers or students and their families. This is crucial to avoid defections during the experimentation.

A questionnaire will be administered to school leaders from the treatment group and control group at the end of the experimental phases. The main aim of this questionnaire is to investigate the school leaders' perception of Artificial Intelligence in Education, the degree of support the school has given for the implementation of the experiment, and the degree of protection of pupils' data collected by AI and its possible use at the school level.

2.2.5 Involvement of students

The involvement of students is different in the two phases of the experimentation. In the large-scale experimentation, a questionnaire will be administered also to the students whose teachers belong either to the treatment group or to the control group. This activity will be carried out at the beginning and at the end of the experimentation.

Aim of the questionnaire is to get a picture of the students' perception of AI and its possible uses in the classroom.

2.3 Anonymization process

Ministries are responsible for managing and coordinating the process to assign anonymizing numbers to each participant (token / identifier). They will manage a participants' table containing the participants' names and their tokens.

All anonymising numbers must contain 3 digits that identify the participant's school and 1 digit that indicates whether they are a student, teacher, or school leader. Teachers' and pupils' tokens will contain two additional digits that will identify them individually.

Ministries will communicate their tokens to participants and the anonymised list of participants to the evaluation partners.

2.4 Randomization process

In each country, the sample will be randomised into two groups: a treatment group and a control group. Ministries are responsible for providing the anonymized list of participating



schools to the evaluation partners and associating each school with the administrative data necessary for randomisation. Each national evaluation partner will then contact the school leaders and the teachers involved into the experimentation and those listed in the control groups.

2.5 Role and activity of the treatment group

Following the general objectives provided by the partners responsible for the content, a general understanding of AI and its mechanisms and a practical use of it will be given to the participants to the project who will have access to the MOOC, to interactive material and face to face sessions with experts and trainers.

2.6 Role and activity of the control group

The control group will be given the preliminary questionnaire and the end of activities questionnaire. No activity or document is provided for the control group. Eventually they will have the opportunity of having access to the MOOC and the textbook at the end of the large-scale experimentation phase, once the project is over.

2.7 Teachers involvement

Teachers' participation is on a voluntary base, although every teacher, by joining the experimentation, commits themselves to completing their participation in the experimentation. Teachers from the treatment and control group will receive a pre-test and a post-test questionnaire. The corresponding questions will focus on their knowledge and familiarity with AI, their feelings towards AI and perceptions of its benefits and risks, their use of AI tools to teach, their satisfaction and engagement in training received (only treatment group).



3. Tools and resources, learning objectives

During the large phase scale implementation, the following tools and resources will be at the core of the project:

Version 2 of the initial version of the online course in asynchronous modality (hybrid MOOC) used during the pilot phase, focused on a general understanding of AI in education. MOOC version 2 will be delivered within end of October 2022 and translated in each language according to the countries' contextual necessities, replacing the initial version of the MOOC and incorporating improvements and updates on the basis of the learning objectives shared in the Methodological Framework. The average duration of the MOOC version 2 will be around 3 hours.

In addition, an interactive textbook will be made available during the large scale experimentation phase as a guideline for the design of interactive activities with the teachers in the context of the webinars or the face to face meeting, or as a resource for the trainers.

Also, a set of interactive activities according to the guidelines provided by University of Nantes will be set up. A common framework of face to face or online training activities will give the common guidelines to the different countries. WP1 and WP2 will work on a joint programme to deliver a common framework for the teacher training activities where there will be compulsory activities and optional activities.

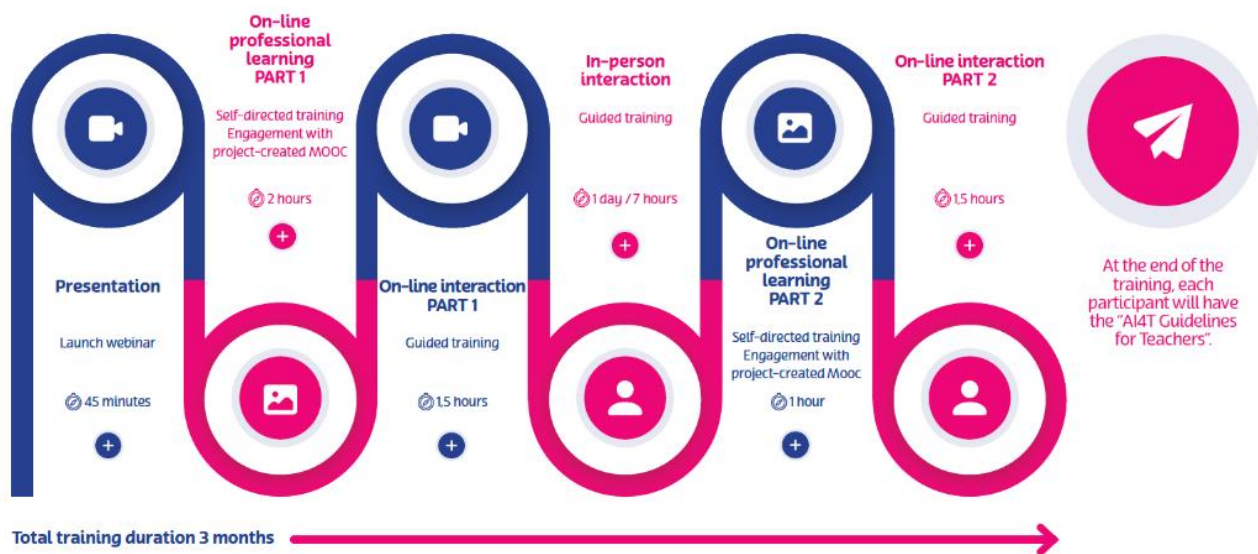
The document attached is a work in progress document with the possible proposed activities [Materials for training session - Fogli Google](#) (in progress document) and the agreed learning objectives, which are reported below.

- Being able to express ones understanding and attitude towards AI and discuss it.
- Being able to understand the basic principles of AI system
- Being aware of AI educational applications and key considerations when identifying, assessing and selecting their AI for teaching, learning and assessment.
- Being aware of legal considerations when using AI in educational setting.
- Being aware of ethical considerations when using AI in educational setting.
- 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)

Within the agreed learning objectives and the common framework of proposed activities, on the basis of the local context, each partner will decide: the type of activities, the resources, the modality of interaction with the teachers (online, blended, in presence) and the degree of involvement of students and their participation in the training activities.

The image below shows the overall training path comprehensive of the MOOC, the webinars and the face to face or online meetings, coherently with the reported learning objectives (as defined in the Methodological Framework).





These resources correspond to the learning objectives of the complete training pathway and MOOC:

- O1 To give teachers a basic to solid culture about AI
- O2 To help teachers with their usual professional practices and reflective approaches on the ethics and culture of the associated data
- O3 To promote the use of digital educational resources using AI bricks in real classroom situations
- O4 To allow teachers to be aware of the indirect effect of AI on education
- O5 To understand the ethical challenges and discussions around the use of AI in education

3.1 AI tools and resources, use and selection.

The ministries in cooperation with the technical team and on basis of the research done to gather relevant materials (either calls for interest addressed to publishers or through universities or research bodies or other sources) will select a set of educational resources and tools which will be used by the teachers in their classrooms. The selection of teacher resources is crucial to allow teachers to work with applications tailored to their own needs and to their countries' context and level of engagement in the digital transition and the use of AI in education practices. However, the ministries will try to use the same resources across the different countries where the above-mentioned contexts are more similar and to maximize the

A brief document with the possible resources which might be used in each country and a set of recommendations on how to list and select them - provided by INRIA- will be shared and agreed by all partners.

[https://3.basecamp.com/3727392/buckets/22492437/vaults/5408686458,](https://3.basecamp.com/3727392/buckets/22492437/vaults/5408686458)

(In progress document).

The AI resources will be selected from the ministries and used during the face-to-face meeting coherently with the framework and learning objectives agreed.



4. Running the project

The overall timeline of the project for the full experimentation phase has been planned as follow. Possible delays and rescheduling of planned dates will be reported during the WP1 and Board meeting in order to keep the partners updated and to plan and agree on possible mitigation actions.

Countries	Pilot phase	Full-scale										Post AI4T
	Sept 2021 - August 2022	Septembre 2022	Octobre 2022	Novembre 2022	Decembre 2022	January 2023	February 2023	March 2023	April 2023	May 2023	June 2023	Sept 2023- August 2024
France												
Italy												
Slovenia												
Ireland												
Luxemburg												

Legend:

	Pilot phase
	Recruitment
	Baseline survey (teachers)
	Endline survey (teachers, school leaders & students)
	Professional learning for the intervention group
	Professional learning for the control group
	Interviews (teachers, school leaders)

The Work packages, as well as the main Steering Committee, will meet on a regular base, the former on a monthly base, the latter every fortnight.

Effective realisation of the A14T project requires that some actions run in parallel and that partners remain in constant communication to ensure that outcomes are consistent with stakeholders' request. It also demands efficient multi-disciplinary cooperation between consortium members as well as strong management in terms of decision-making and project implementation.

5. Partners in charge

5.1 Project Coordinator

France Education International (FEI) coordinates the project. The Project Coordinator (FEI) operates at the strategic project management level, having the overall project responsibility; it coordinates and ensures the collaboration between the appointed work package leaders and their teams. Furthermore, the Project Coordinator represents the project to the European Commission or elsewhere as required and coordinates the dissemination and exploitation of project outcomes.

5.2 Steering Committee or Management Board

The Steering Committee is composed of one representative from each member of the Consortium. It makes strategic decisions concerning project implementation and risk management. Decisions are made by consensus among partners; if there is a major disagreement, a vote will be organised. The voting rule is simple majority. When an issue arises that must be dealt with rapidly, the Steering Committee may not have the time to meet to vote. In this case, partners will be consulted at a distance, using an online platform that allows them to express their views, as for instance, the platform www.doodle.com which allows each partner to give one vote.

5.3 Working Groups

Five main working groups have been created to coordinate the delivery of key project activities:

- WP1 Experimentation WG comprising ministerial entities and the coordinator.
- WP2 Training WGs - comprising the training organisations and ministerial entities, that will work on both online and face-to-face training content development.
- WP3 Evaluation WG - composed of evaluators to carry out the impact study. The results generated by this evaluation done by this team will concretely determine the qualitative and quantitative outcomes of the implemented measure.
- WP4 – Dissemination and upscaling. The team will elaborate strategy to promote the project outside the partnership. And to facilitate the creation of a European network of “AI teachers”.
- WP5 – Quality Assurance This last work package has been added between the pre-proposal and the full proposal stages. It comprises: - Risk strategy and tools: to anticipate and mitigate any risk - Quality strategy: to ensure the quality of results.



The Steering Committee may decide to create additional ad hoc working groups dedicated to specific areas of the intervention, if needed. The exchange of knowledge and information will be ensured through a web based collaborative environment that will serve 4 purposes:

- Internal communication: To allow remote synchronous and asynchronous communication between individuals and within the partnership.
- Storage: To provide a shared online repository for project documents, resources, materials.
- Cooperation: To allow cooperative online editing of documents.
- Monitoring: To permit progress monitoring.

The common official platform for collaborative working will be Basecamp.

4.4 Work Packages and their leaders

For each work package (WP) there is a leader responsible for the management and coordination of the tasks comprising the work package (Table 1).

The work package leaders coordinate the work tasks pertaining to the WP and are responsible for the timely delivery of project outputs. This includes ensuring that outputs are developed under the processes and criteria set in the Quality Plan issued by H2Learning.

Following, a scheme of all the work package and their leaders:

WP	Title	WP Leader
<i>WP0</i>	Project Management:	France Education International (FEI) Evelyne Huréhure@franceducationinternational.fr
<i>WP1</i>	Experimentation	Italian Ministry of Education Giuseppina Russo giuseppina.russo124@posta.istruzione.it

WP2	Training architecture and resources	Université de Nantes Colin de la Higuera cdlh@univ-nantes.fr
WP3	Evaluation	Cnesco-Cnam Aurelie Paris aurelie.paris@lecnam.net
WP4	Dissemination and upscaling	Ministry of Education, Science and Sport (MESS) Slovenia Borut Campelj, Petra Bevek Borut.Campelj@gov.si Petra.Bevек@gov.si
WP5	Quality Assurance	H2 Learning (H2) Maria Fojk, Michael Hallissy mfojk@h2.ie mhallissy@h2.ie

