Methodology for the evaluation of usability and technology acceptance

M12: 31 December 2023

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Grant Agreement nº	101087451
Project acronym	AI4EDU
Project title	Conversational AI assistant for teaching and learning
Funding Scheme	ERASMUS-EDU-2022-PI-FORWARD
Project Duration	01/01/2023 – 31/12/2025 (36 months)
Coordinator	Athina-Erevnitiko Kentro Kainotomias Stis Technologies Tis Pliroforias, Tonepikoinonion Kai Tis Gnosis (ARC)
Associated Beneficiaries	▪ LULEA TEKNISKA UNIVERSITET (LTU) ▪ ELLINOGERMANIKI AGOGI SCHOLI PANAGEA SAVVA AE (EA) ▪ PAIDAGOGIKO INSTITOUTO KYPROU (CPI) ▪ UNIVERSITY OF CYPRUS (UCY) ▪ MANAGEMENT COMMITTEE OF DRUMCONDRA EDUCATION CENTRE (DEC)

Document identifier: D4.1
Version: 2.0
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Reviewers: Dr. Spyridoula Stamouli (ARC), Anna Vacalopoulou (ARC)
Dissemination status: PU

Project no. 101087451
AI4EDU

Conversational AI assistant for teaching and learning

ERASMUS-EDU-2022-PI-FORWARD

Start date of project: 01/01/2023

Duration: 36 months

History Chart				
Issue	Date	Changed page(s)	Cause of change	Implemented by
0.1	19.12.2023	-	Draft	Gregory Milopoulos
1.0	22.12.2023	All	Changes by reviewers	Reviewers
2.0	29.12.2023	All	Final editing	Gregory Milopoulos

Validation			
No.	Action	Beneficiary	Date
1	Prepared	EA	19.12.2023
2	Approved	ARC	29.12.2023
3	Released	ARC	31.12.2023

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Table of Contents

Executive Summary

The purpose of this document, "D4.1 Methodology for the Evaluation of Usability and Technology Acceptance," is to establish a comprehensive framework for assessing how the AI4EDU applications are received and utilized in real-world educational settings. This evaluation is critical to ensure that the technology developed aligns with user needs and preferences, thus maximizing its effectiveness and impact in educational practices.

This deliverable synthesizes critical insights from the evaluation process and lays the groundwork for refining and optimizing the AI4EDU developed applications, Teacher Mate and Study Buddy, ensuring their efficacy as transformative tools in modern educational environments. It provides a detailed overview of the evaluation process for Teacher Mate and Study Buddy, the primary AI tools in the project's educational framework.

The document begins (Section 1) with an overview of the AI4EDU project that highlights the project's main objectives and the specific targets of Work package 4.

Section 2 presents the Prototype Definition for Evaluation, thoroughly exploring the features, components, and specifications of Teacher Mate and Study Buddy.

Methodology Design (Section 3) outlines the user-centered approach adopted for the evaluation, ensuring alignment with the pedagogical framework and user requirements (WP2). It also discusses specific use cases for piloting experiments, participants selection, materials, and methods employed in the evaluation process.

Technical Evaluation Criteria and Metrics (Section 4) break down the evaluation into key dimensions, including usability, technology acceptance, qualitative assessment, and the analysis of system-generated data from user interactions. This section provides a comprehensive understanding of the tools' effectiveness in various educational contexts.

Section 5, Pilot Implementation Procedures & Scenarios, details the pilot timeline, setup requirements, and the practical aspects of deploying Teacher Mate and Study Buddy in real educational scenarios. The section concludes with insights gathered during the pilot processes, offering a holistic view of the tools' performance and user interactions.

Acronyms and abbreviations

Abbreviation	Description
AI	Artificial Intelligence
AI4EDU	Artificial Intelligence for Education (project short name)
GDPR	General Data Protection Regulation
ICT	Information and Communication Technology
LLM	Large Language Model
RAM	Retrieval Augmented Generation Architecture
TAM	Technology Acceptance Model
UX	User Experience
WP	Work Package

1. Introduction

AI4EDU seeks to make learning more engaging, personalized, and ultimately, more effective. This initiative revolves around the development and assessment of AI tools, namely Teacher Mate and Study Buddy, tailored to enhance the educational experience for both educators and students.

We wish to explore, examine and understand how easy or challenging it is for teachers and students to use Teacher Mate and Study Buddy, whether they like or dislike using and engaging with them and how they feel overall. Throughout the project we are going into all the details to figure out exactly how these tools fit into the teaching and learning practice and to understand the different ways these tools can enhance teaching and learning.

The execution of tasks within WP4, particularly tasks 4.1 and 4.2, relies heavily on the active involvement of all project partners. Task 4.1 focuses on the technical evaluation of the AI tools, demanding a fusion of technical expertise and pedagogical insights. Partner participation in this task brings a diversity of perspectives, ensuring that the evaluation considers the unique requirements of varied educational systems, curricula, and contexts.

Task 4.2 shifts the focus to qualitative dimensions, aiming to capture the experiences of educators and students utilizing Teacher Mate and Study Buddy. This task is linked to the user-centered approach, underlining the significance of integrating user feedback into the iterative development process.

Usability and technology acceptance are fundamental to the success of any new tool or application. Usability refers to the ease with which users can interact with and benefit from the technology, while technology acceptance is the extent to which users are willing to employ and integrate the new technology into their existing practices. Both aspects are considered as particularly significant; even the most advanced technological innovations can fail to make an impact if they are not user-friendly or if they do not meet the practical needs and expectations of their intended audiences. In educational settings, where the diversity of users (teachers and students) and their varying degrees of tech-savviness pose unique challenges, the focus on usability and technology acceptance becomes even more crucial.

The methodology outlined in this document is geared towards understanding and optimizing these aspects. By thoroughly evaluating the AI4EDU applications for usability and technology acceptance, the project aspires to deliver tools that are not only technologically advanced but also resonate with and add value to the educational community.

All partners' collaborative efforts contribute to the evaluation process and to the ongoing refinement and optimization of the AI tools. Their engagement ensures that the tools align with diverse educational contexts in different European countries, making them widely applicable and impactful.

2. Prototype Definition for Evaluation

The technical specifications for the Study Buddy and Teacher Mate tools, shaped by user requirements, as derived from workshops with teachers and students and outlined in D2.1, create a robust framework for the educational experiences these tools aim to offer.

2.1. Features and Components

Study Buddy, conceived as a conversational AI system for student support, features functionalities such as direct instruction, educational guidance, interactive exams, and feedback on assignments. Technical specifications detail the operation of these features, ensuring a seamless user interface. Teacher Mate, tailored for educators, is equipped with features aiding exam generation, marking, and real-time student performance evaluation accessible through a Teacher Dashboard. Additional conversational features support lesson preparation, lesson plan creation, and teaching material development. Technical specifications prioritize the reliability and scalability of these functionalities, establishing a dependable AI toolset for education. Ongoing refinement of these specifications aligns them with user feedback and evolving technological standards as the project progresses.

Regarding the selection of use cases for AI applications, analysis of data collected during workshops across the four participating European countries determined the final choices. The selection of use cases is based on technological feasibility and pedagogical impact, ensuring the AI tools align with and enhance educational objectives.

Student use cases for the Study Buddy tool encompass diverse functionalities, enabling exploration of learning content, question generation, assessment, feedback provision, addressing queries, summarizing textbook content, elucidating key concepts, and adaptive learning support. Operating in three European languages—English, Greek, and Swedish—the Study Buddy tool focuses on secondary school curriculum subjects.

Teacher use cases for the Teacher Mate tool, tailored for educators, offer essential functionalities. The tool facilitates question generation, automated grading, progress monitoring, and subject-specific intervention. Supporting three European languages and focusing on secondary school subjects in Science and Humanities, the Teacher Mate integrates a conversational mode to aid teachers in daily practices like lesson planning and material creation.

The project chooses subjects from Biology, History, Social Science, Civil Education, and Sustainability, with each participating country focusing on two. This holistic approach ensures the tools' relevance and applicability across diverse educational settings.

2.2. Teacher Mate & Study Buddy Specifications

The high-level system functional specifications delineate the operational framework of the Study Buddy and Teacher Mate systems, presenting a cohesive educational platform leveraging AI for personalized learning and teaching.

The primary user roles are categorized as Students and Teachers, with the system encompassing three core functionalities:

- Question Generation,
- Question Answering, and
- Automatic Short Answer Grading.

Through the Question Generation, the system aims to create curriculum-aligned questions from textbook content for assessments. It utilizes educational content from schoolbooks to generate diverse question types, seamlessly integrating with both Study Buddy and Teacher Mate interfaces.

Question Answering utilizes a conversational AI model and the Retrieval Augmented Generation Architecture (RAG) to interact with students, offering explanations, clarifications, and answers by interpreting questions and searching through textbook content.

The Automatic Short Answer Grading System evaluates and grades students' written responses automatically, analyzing answers against predefined criteria and providing immediate feedback within the Teacher Mate environment.

The interfaces provided to users include Study Buddy, a dialogue system interacting with students in natural language, available in the forms of a chatbot, a voice assistant, and an embodied virtual character, and Teacher Mate, a web-based educational environment offering a dialogue interface, as well as a dashboard for teachers. Study Buddy, functioning as a mentor and tutor, facilitates interaction through a wide range of prompts, offering assistance in everyday studying, support for individual projects, and preparation for tests or exams. The Study Buddy encompasses a test interface, controlled by the teacher, which offers a stress-free and intuitive platform for students to take low stakes tests, ensuring security, integrity, and privacy. Teacher Mate offers an environment for automatic test creation and administration, as well as monitoring students' performance and progress. Teacher is in the loop of the assessment procedure, being able to select and modify questions, providing model answers and assessment criteria, evaluating and modifying the automatically assigned grades and personalising feedback. Conversational features of Teacher Mate provide aids in lesson preparation, creation of teaching materials, and provides personalized feedback based on student performance.

Non-functional specifications are vital for overall system performance. Usability ensures an intuitive interface for efficient navigation, scalability handles increased data and user volume, and reliability minimizes downtime and errors. Security protocols safeguard sensitive educational data, compatibility ensures accessibility across devices and platforms, and performance optimizes speed and efficiency. Data backup and recovery prevent loss, while documentation and support aid user understanding, and user support services enhance troubleshooting capabilities for teachers.

These specifications form the technological background of the AI4EDU system, balancing functionality with reliability, security, and usability to provide an effective educational toolset.

3. Pilot Methodology Design

The pilot methodology is designed to fit within the regular educational activities without causing significant disruptions. It will be integrated into the curriculum where possible, with specific time slots allocated for the use of the applications. The implementation plan is designed to offer flexibility, allowing to accommodate the varying schedules and constraints of the participating schools.

3.1. User-Centered Approach Definition

The evaluation methodology in Work Package 4 (WP4) of the AI4EDU project is grounded in a user-centered approach. This approach prioritizes the needs, experiences, and feedback of the end-users — primarily teachers and students — who will interact with the AI4EDU applications, Teacher Mate and Study Buddy.

Key elements of the user-centered approach in WP4 include:

- Engagement with End-Users: Direct involvement of teachers and students in the evaluation process to gather authentic feedback.
- Iterative Feedback Loops: Utilization of continuous feedback to refine and improve the applications throughout the development cycle.
- Empathy and Understanding: A focus on empathizing with the end-users to understand their challenges, needs, and expectations from the AI4EDU applications.

Part of this approach involves inquiring into teachers' experiences with Teacher Mate. We seek to investigate their views on its usability, their confidence in its use and identify potential challenges. In the case of students, we analyse their interactions with the Study Buddy, considering factors such as comprehension, frequency of use, and preferences in terms of the functionalities offered. Our focus extends beyond quantitative data, since we also seek to investigate the collaborative dynamics between teachers and students when engaging with these tools, providing insights into their respective roles and the impact of these tools on the teaching and learning processes. After using the tools, we ask teachers and students for their thoughts in follow-up conversations. This helps us get more detailed insights, as a way to improve the tools based on real experiences.

Teachers serve as valuable stakeholders who not only utilize the tools but also are in the loop of their ongoing development with a significant contribution. Their pedagogical and teaching experience plays a critical role in enhancing the efficacy of our technology within the educational context. Likewise, students assume an active role as participants, aiding us in refining the Study Buddy application to enhance its effectiveness as an educational tool.

This approach ensures that the development of the AI4EDU applications is not just technologically driven but is also responsive to the practical and pedagogical needs of its users.

3.2. Relationship with the Pedagogical Framework and other WPs

WP4 is intricately linked with other work packages in the AI4EDU project, establishing a synergistic relationship that enhances the overall project's efficacy.

WP4 builds upon the outcomes of Work Package 2 (WP2), which focuses on the pedagogical framework, deployment of user requirements, and technical specifications of the AI4EDU applications. The insights gained from WP2 are instrumental in shaping the evaluation criteria and methods used in WP4.

The close connection between the evaluation methodology of WP4 and the expected outcomes of Work Package 2 (WP2) plays a crucial role in ensuring that AI4EDU's objectives remain clear and consistent. This alignment is not just a theoretical exercise; it is a deliberate effort to combine real-world classroom insights with the broader goals outlined in WP2.

WP2, as outlined in the deliverables D2.1 and D2.2, presents a comprehensive framework of the pedagogical and technical foundations of AI4EDU regarding AI technology's development in education, encompassing digital competencies, adaptive pedagogy, and the broader context of technology's influence in education.

WP4 evaluation methodology integrates with WP2, where user requirements and insights from stakeholders are collected. This systematic approach involves various aspects of user needs and requirements, including potential benefits, risks, acceptance levels, suggested use cases, recommended features, and overall conclusions drawn from the initial investigation of teachers' and students' needs. This iterative process ensures that the evaluation methodology followed in WP4 is an extension of the collaborative efforts outlined in WP2.

Furthermore, our alignment with educational paradigms such as student-centred education, inquiry-based education, dialogic education, scaffolding education, and special needs and inclusive education underscores AI4EDU's commitment to evaluating the practical implications and effectiveness of AI tools in these diverse contexts.

The findings and recommendations emerging from WP4 directly inform the technical upgrades and refinements undertaken in Work Package 5 (WP5). WP5's focus on the technical enhancement of the AI4EDU applications is guided by the usability and acceptance insights provided by WP4.

While WP4 concentrates on the usability and technology acceptance of the AI4EDU applications, Work Package 6 (WP6) focuses on evaluating the impact of these applications on teaching and learning outcomes. Together, WP4 and WP6 provide a comprehensive assessment of the AI4EDU project from both a technological and educational perspective.

3.3. Specific Use Cases for Piloting Experiments

The AI4EDU project focuses on developing conversational AI tools, namely Teacher Mate for educators and Study Buddy for students, tailored to subjects within applied science (specifically Biology) and humanities/social sciences (History, Social Sciences, Civil Education, and Sustainable Development) at various secondary education grade levels. In applied science, such as Biology, the tools aim to facilitate practical application, data analysis, and problem-solving, serving as facilitators for active engagement and real-world scenario exploration.

For humanities and social sciences, the emphasis is on fostering critical thinking, analysing societal structures, and understanding human behaviour. The project partners collaboratively address the unique needs of each subject, ensuring a tailored approach to applied science and humanities/social science education.

The selected secondary education subjects include Sustainable Development, Biology, Social Sciences, Civil Education, and History, spanning various grade levels in partner countries (Ireland, Cyprus, Sweden, and Greece). The evaluation of the tools will focus on these subjects, assessing both usability and educational impact.

Table 1: Selected school subjects to be covered by the AI4EDU tools

Partner (Country)	Subject (Science)	Grade (Years)
DEC (Ireland)	Sustainable Development	Junior and Senior Secondary (12-17)
UCY & CPI (Cyprus)	Biology	Lower secondary (14-17)
LTU (Sweden)	Biology	Gymnasium (16-17)
EA (Greece)	Biology	Lower secondary (13-15)

Partner (Country)	Subject (Humanities & Social Sciences)	Grade (Years)
LTU (Sweden)	Social sciences	Gymnasium (16-17)
DEC (Ireland)	Civil Education & Sustainability	Junior and Senior Secondary (12-17)
CPI (Cyprus)	History	Lower Secondary (14-17)
EA (Greece)	History	Lower secondary (13-15)

3.4. Participants, Materials and Methods

The implementation plan is designed to integrate the Teacher Mate and the Study Buddy into each of the chosen schools' curricula.

The primary participants in the evaluation process will be teachers and students from selected collaborating schools in the four project countries. Teachers will have experience in the selected school subjects of secondary education, while students' age groups will be corresponding to the selected school grades per country (see Table 3). There are no exclusion criteria for participants of the pilot activities. All participants should be either native or proficient speakers of the respective project language, i.e. English, Greek and Swedish, so they can efficiently interact with the educational applications, and provide their input and feedback on their use through questionnaires and interviews.

Especially in the case of student participants, effort will be made to include students with diverse educational needs, such as students with learning difficulties or any other special education needs, to ensure inclusive and non-discriminatory testing of usability and user-experience of the AI4EDU applications.

The materials used in the evaluation will include:

- AI4EDU Applications (Teacher Mate and Study Buddy): The actual software applications to be evaluated.
- Evaluation Tools: Questionnaires, interview guides, and observation checklists designed to capture detailed feedback on usability and technology acceptance.
- Instructional Materials: Guides and tutorials to help participants understand and use the AI4EDU applications effectively.

Thus, the evaluation will employ a mix of quantitative and qualitative methods, including:

- Surveys and Questionnaires: To quantitatively assess user satisfaction, ease of use, and the perceived utility of the AI4EDU applications.
- Interviews and Focus Groups: To gather in-depth qualitative insights into the user experience and suggestions for improvement.
- Observational Studies: To document how teachers and students interact with the applications in real-time, providing insights into user behavior and application performance in naturalistic settings.

The methodology encompasses brief introduction sessions, interactive demonstrations, and a feedback collection mechanism, both formalized through questionnaires and informal discussions. These methods are designed to provide a comprehensive understanding of how the AI4EDU applications are perceived and used by teachers and students, which is critical for assessing their usability and acceptance in educational environments.

3.5. Ethical Considerations

The evaluation activities of WP4 adhere to the EU ethical standards, regulations and recommendations on the use of AI and data in teaching and learning[1], particularly since minors are involved in piloting activities. This includes fully informing participants on the pilot

[1] European Union, 2022: Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for Educators (https://education.ec.europa.eu/news/ethical-guidelines-on-the-use-of-artificial-intelligence-and-data-in-teaching-and-learning-for-educators, accessed 21/12/2023)

procedure and its objectives, obtaining informed consent from participants, ensuring fairness, non-discrimination and transparency, respecting participants' privacy and autonomy, addressing potential risks or discomforts and ensuring data protection. Special attention is given to creating a safe and open environment for participants during pilots.

Participants are fully informed about the AI4EDU pilot, its purpose, voluntary nature, the specific activities they will be engaged in and their estimated duration, the technologies used, their or other parties' benefits, as well as the measures applied for safeguarding their data privacy. Informed consent will be obtained by teachers and students. Especially in the case of students, informed consent will be obtained also from their parents or guardians (see Appendix 2 for Information Sheets and Consent Forms).

Data collected and analysed during pilots are listed and explained in section 4.5. No sensitive data, personal data or other personally identifiable information will be collected in any of the pilot activities. Secure survey tools will be used to collect information from participants, which will not contain names or any other personal information. Student and teacher participants in pilots will be assigned a study identification number, which will be connected to their interactions with the AI4EDU applications.

All participants' interactions with the AI4EDU applications will be under strict supervision by authorised researchers. Data acquired pilots will be shared with the project partners involved in the respective WPs for research and development purposes only, under secure data access provisions. More specifically:

Secure data storage systems will be used to protect data from unauthorized access or tampering, such as firewalls and intrusion detection systems. The choice of storage media will depend on the size and type of data. Small amounts of text data will be stored in gitlab, while large amounts of data will be stored in secure servers or in the cloud (AI4EDU Microsoft SharePoint). Cloud storage solutions will be also used to store anonymized and free of personal and personally identifiable information. These services will offer additional security, including encryption, access controls, and monitoring.

Apart from project-internal data sharing, the creation of publicly available educational datasets is considered as a particularly important project result, addressed to the research community, as part of the project outcomes. These datasets will be fully anonymized, free of personal or personally identifiable information and will be shared through open repositories. Data generated from individual interactions with the project's AI tools during the piloting activities, will only be made available with the explicit permission from the end user.

Contact details of the AI4EDU researchers and the respective Data Protection Officers from each country will be provided to all participants in their informed consent form, in case they wish to report a complaint or a concern regarding their participation in piloting activities.

Finally, since participation in user pilots requires teachers and students to take time out of their regular academic schedules, researchers will ensure that possible educational disruption is minimal and does not negatively impact the students' academic progress or teachers' duties. The duration of each activity of the pilots is clearly stated in the Participant Information Sheet.

4. Technical Evaluation Criteria and Metrics

4.1. Criteria for Evaluation

The evaluation of usability and technology acceptance within Work Package 4 (WP4) of the AI4EDU project yields critical data on the performance and reception of the AI4EDU applications, Teacher Mate and Study Buddy. This evaluation focuses on how these applications are used, perceived, and accepted by the end users — teachers and students — in various educational settings.

The results are analysed to assess key aspects such as the intuitiveness of the applications, the ease with which users can accomplish their tasks, and the overall satisfaction with the user experience. Additionally, the evaluation seeks to understand the degree to which these applications are accepted and integrated into daily educational practices. Therefore, the piloting procedures aim to ensure that the AI4EDU applications are not only technologically advanced but also resonate with the needs and preferences of the end-users, ultimately leading to effective and widespread adoption in educational settings.

The evaluation during the piloting phase is guided by specific criteria centred around user experience, usability, and technology acceptance. These criteria are defined as follows:

- Usability: Evaluating how easy and efficient it is for users to achieve their goals using the applications. This includes assessing the clarity of instructions, and the effectiveness of the applications in facilitating educational tasks (see section 4.2 for details).
- Technology Acceptance: Determining the extent to which users are willing to adopt and integrate the AI4EDU applications into their daily educational practices. This involves understanding users' perceptions of the usefulness and relevance of the applications in their teaching and learning processes (see section 4.3 for details).
- User Experience (UX): Assessing the overall satisfaction, engagement, and responsiveness of users while interacting with the applications. Factors such as intuitive design, ease of navigation, and the appeal of the user interface are considered (see sections 4.4 & 4.5 for details).

4.2. Usability

The usability testing experiments aim to investigate the degree to which the AI4EDU applications are user-friendly, engaging, and effective in educational settings. The evaluation criteria for the usability testing experiments are aligned with the overarching goals of the AI4EDU project and include:

- Ease of Use: Assessing how easily users can navigate and interact with the applications, including the intuitiveness of the interface and the clarity of instructions.
- User Engagement: Evaluating the level of engagement and interest users show while using the applications, which is indicative of the applications' ability to capture and retain user attention.
- Effectiveness: Determining how effectively the applications facilitate educational tasks, enhance learning experiences, and meet the intended pedagogical objectives.
- User Satisfaction: Measuring the overall satisfaction of users with the applications, including their willingness to continue using them and recommending them to others.
- Technology Integration: Assessing how well the applications integrate with existing educational practices and technology ecosystems.

4.3. Technology Acceptance

AI4EDU will utilize a Technology Acceptance Model (Davis, 1989) or TAM. TAM is an information systems theory that models how users come to accept and use a technology. According to TAM, when users are exposed to a new technological solution, certain factors impact their decision regarding how and when they will use it. The most common ones concern the perception that the technology does something useful (perceived usefulness) and that a given technology is easy to use (perceived ease of use).

The questionnaires designed for evaluating the technology acceptance of the Teacher Mate and Study Buddy tools in the AI4EDU project play a pivotal role in obtaining valuable insights for the project's evaluation in Work Package 4. These questionnaires are designed to measure various dimensions, providing a comprehensive understanding of the user experience and perceptions.

The Teacher Mate usability aspects questionnaire encompasses critical factors such as frequency of use, perceived complexity, ease of navigation, need for facilitator support, integration of functions, and user confidence. Each question contributes to the assessment of the tool's usability from the perspective of teachers. Simultaneously, the Study Buddy usability aspects questionnaire targets students, covering similar dimensions. The aim is to evaluate the tools' user-friendliness, efficiency, and overall effectiveness in supporting learning and teaching activities.

The Technology Acceptance section explores users' perceptions using a Likert scale, offering a nuanced view of their interactions with Teacher Mate and Study Buddy. This section breaks down into Effort Expectancy, Performance Expectancy, Attitude Toward Using Technology, Social Influence, Facilitating Conditions, Self-Efficacy, Perceived Credibility, and Behavioural Intention.

The data collected through these questionnaires will be fundamental for evaluating the effectiveness of Teacher Mate and Study Buddy in real-world educational settings. The responses will aid in identifying strengths, weaknesses, and areas for improvement, enabling the project team to make informed decisions for further development and refinement. In essence, these questionnaires act as a structured mechanism to gather user feedback, fostering iterative enhancements that align with the ultimate goal of creating impactful and user-friendly AI tools for education.

4.4. Qualitative Evaluation

The qualitative evaluation aims to provide a comprehensive understanding of the Teacher Mate and Study Buddy tools from the perspectives of teachers and students. The plan ensures a thorough assessment, leading to informed refinements and improvements in the AI4EDU project. This plan outlines the approach to be taken, focusing on teachers and students separately.

Teachers' Qualitative Evaluation Plan

- Ensure all teachers actively participate in the Teacher Mate evaluation process. Distribute a detailed guide on the evaluation process, highlighting its importance and soliciting full engagement from each teacher.

- Verify that all participants align with the predefined aims of the Teacher Mate pilot. Clearly communicate the objectives and expected outcomes of the pilot to teachers before the evaluation begins. Emphasize the importance of staying true to these aims.
- Identify if teachers face confusion regarding definitions or instructions within the Teacher Mate tool. Incorporate questions probing teachers' understanding of key terms and instructions. This will provide insights into areas that may need clarification.
- Ensure that teachers adhere to assigned roles during the evaluation. Clearly define roles for each teacher and provide guidelines on their responsibilities. Regularly check-in to confirm adherence and address any concerns or issues.
- Craft questions that assess teachers' comprehension of fundamental concepts. This will provide valuable insights into the effectiveness of the tool in conveying essential information.

Students' Qualitative Evaluation Plan

- Ensure active participation of all students in the Study Buddy evaluation. Design engaging activities or incentives to motivate students. Clearly outline the benefits of their participation in the study.
- Confirm that the student participants align with the predefined aims of the Study Buddy pilot. Clearly communicate the objectives and expected outcomes of the pilot to students. Emphasize the importance of their contribution to achieving these aims.
- Assess whether the students encounter confusion about the processes involved in the Study Buddy pilot. Include questions in the questionnaire that explore specific processes within Study Buddy. Collect qualitative data to uncover any areas of confusion.
- Identify if students face confusion regarding definitions or instructions within the Study Buddy tool. Incorporate questions probing students' understanding of key terms and instructions. This will provide insights into areas that may need clarification.
- Ensure that students adhere to assigned roles during the evaluation. Clearly define roles for each student and provide guidelines on their responsibilities. Regularly check-in to confirm adherence and address any concerns or issues.
- Implementation: Craft questions that assess students' comprehension of fundamental concepts. This will provide valuable insights into the tool's effectiveness in conveying essential information.

4.5. System-generated data from user interactions

The system collects data from user interactions. The analysis of this data will be based on metrics that collectively contribute to a thorough evaluation of Teacher Mate and Study Buddy, offering valuable insights into their effectiveness and impact on the learning experience. Each metric plays a specific role in assessing different facets of the AI tools, and their inclusion is justified by their significance in ensuring the reliability, efficiency, and overall quality of the educational support provided.

Response Accuracy: This metric focuses on assessing the accuracy of responses provided by Teacher Mate and the correctness of Study Buddy's responses and information. This metric aims at investigating the degree to which the educational content generated aligns with

learning objectives, providing reliable and accurate information to users. AI4EDU tools will be evaluated regarding accuracy with the contribution of collaborating teachers, specialized in the instruction of the selected school subjects per country. Teachers will be asked to rate a sample of the generated responses of the Study Buddy and Teacher Mate on the basis of a set of quality criteria, such as accuracy, relevance, clarity, completeness, reliability and language correctness.

Response Time: The time taken by Teacher Mate to respond to queries and the speed of Study Buddy in providing responses are crucial aspects of user experience. Quick response times enhance user engagement by ensuring timely support. Longer response times may indicate areas for improvement in efficiency. This metric's inclusion is justified by its impact on overall responsiveness and user satisfaction with the educational support provided.

System Uptime and Usage Patterns: Monitoring system uptime and identifying any downtime periods for Teacher Mate and tracking Study Buddy's usage patterns, including peak usage times and potential downtimes, help optimize system availability. Identifying usage patterns aids in resource allocation and system improvements. The justification lies in ensuring optimal accessibility of educational support resources and making informed decisions for system enhancements.

User Interactions: Understanding how users interact with Teacher Mate during conversations and analysing the purpose and frequency of user interactions with Study Buddy provides insights into user preferences. This information helps refine the AI's conversational abilities and tailor educational content to meet user needs. The justification lies in enhancing user engagement and adapting the AI's responses to user preferences. To this end, a tool for labelling user interactions regarding several aspects of use, such as the purpose of the user questions, the type of information asked (e.g. lesson plan, definition, example, help with essay etc), as well as the relevance of the interaction to the educational context (e.g. off topic questions), is designed and will be used to annotate a sample of users' interactions and draw valuable conclusions on the content of users conversations with the AI tools.

Usage per User: Tracking the time spent by each user, the number of questions asked, and responses received in both Teacher Mate and Study Buddy provides insights into individual usage patterns. This supports the personalization of content based on individual learning patterns. The justification lies in adapting the educational experience to individual user behavior, promoting a more personalized and effective learning journey.

Number of Words in Q&A: Examining the length of questions and answers in Teacher Mate conversations and assessing the complexity and depth of interactions in Study Buddy based on word counts provide insights into the depth of engagement with educational content. Longer, more detailed interactions may indicate a deeper understanding of the material. The justification lies in understanding the level of user involvement and the comprehensiveness of the AI's responses.

Number of Tokens: Measuring the number of tokens (words or characters) exchanged in each conversation for both Teacher Mate and Study Buddy helps quantify the richness and complexity of conversations. Higher token counts may indicate more in-depth discussions, contributing to a more comprehensive learning experience. The justification lies in quantifying the depth and richness of educational interactions facilitated by both AI tools.

Conversation Duration: Evaluating the total time taken for a conversation with Teacher Mate and examining the duration of Study Buddy interactions from start to finish provides insights into engagement levels and the depth of educational interactions. Longer conversation

durations may suggest in-depth discussions or complex queries. The justification lies in understanding user engagement levels and the depth of educational interactions facilitated by both AI tools.

Aggregate User Measures: Aggregating metrics such as user interactions, questions asked, and responses received, provides a holistic view of overall user engagement and system utilization for both Teacher Mate and Study Buddy. Understanding overall user behavior and preferences supports comprehensive evaluations of the educational impact of both AI tools. The justification lies in offering a comprehensive view of the effectiveness and impact of the tools on the learning experience.

Table 2 outlines key evaluation metrics, their respective assessments for both Teacher Mate and Study Buddy, and the justification for their inclusion in the evaluation framework.

Table 2: Key evaluation metrics

Metric	Teacher Mate Evaluation	Study Buddy Evaluation	Justification
Response Accuracy	Assess the accuracy of Teacher Mate's responses to queries.	Evaluate the correctness of Study Buddy's responses and information provided.	High accuracy indicates the effectiveness of the AI in understanding and addressing user queries, leading to reliable educational support.
Response Time	Analyze the time taken by Teacher Mate to respond to queries.	Examine the speed of Study Buddy in providing recommendations and information.	Quick response times enhance user experience, ensuring timely support and maintaining engagement.
System Uptime and Usage Patterns	Monitor system uptime and identify any downtime periods.	Track Study Buddy's usage patterns, identifying peak usage times	Analysing usage patterns helps optimize system availability
User Interactions	Understand how users interact with Teacher Mate during conversations.	Analyze the nature, content and frequency of user interactions with Study Buddy.	Insights into user interactions help refine the AI's conversational abilities and tailor educational content to meet user preferences and needs.
Usage per User	Track the time spent by each user, the number of questions asked, and responses received.	Monitor user engagement in Study Buddy, including time spent and the frequency of interactions.	Individual usage patterns provide insights into user preferences, allowing for personalized adaptations in both Teacher Mate and Study Buddy.
Number of Words in Q&A	Examine the length of questions and answers in Teacher	Assess the complexity and depth of interactions in	Longer, more detailed interactions may indicate a deeper engagement with the educational

	Mate conversations.	Study Buddy based on word counts.	content. Analyzing the length of Q&A sessions provides insights into the level of user involvement.
Number of Tokens	Measure the number of tokens (words or characters) exchanged in each conversation.	Assess the token count for Study Buddy interactions to understand content depth.	Tracking tokens helps quantify the richness and complexity of conversations. Higher token counts may indicate more in-depth discussions.
Conversation Duration	Evaluate the total time taken for a conversation with Teacher Mate.	Examine the duration of Study Buddy interactions from start to finish.	Longer conversation durations may suggest in-depth discussions or complex queries. Analyzing conversation duration aids in understanding user engagement levels and the depth of educational interactions facilitated by AI4EDU's tools.
Aggregate User Measures	Aggregate metrics such as user interactions, questions asked, and responses received.	Summarize aggregate measures for Study Buddy, including user engagement and content interactions.	Aggregated metrics provide a holistic view of user engagement and system utilization. Understanding overall user behavior and preferences supports comprehensive evaluations of the educational impact of AI4EDU's tools.

4.6. Methods of Analysis

The data collected through usability testing experiments will be analyzed using both quantitative and qualitative methods:

- Quantitative Analysis: Employing statistical methods to analyse survey responses, usage data, and other quantifiable metrics. This analysis helps in understanding trends, preferences, and general user behaviour patterns.
- Qualitative Analysis: Conducting thematic analysis of interview transcripts, open-ended survey responses, observation notes and annotations of user interactions with the AI4EDU tools. This analysis provides deeper insights into user attitudes, perceptions, and experiences.
- Comparative Analysis: Comparing data across different user groups, application versions, and usage contexts to identify significant differences and commonalities.

5. Pilot Implementation Procedures & Scenarios

The first cycle of piloting focuses on the evaluation of the initial version of the AI4EDU applications. This cycle is crucial for gathering initial reactions and feedback, which will inform subsequent refinements. The key aspects of this phase include:

- Implementation: Deploying the first version of Teacher Mate and Study Buddy in the selected pilot sites for a defined period.
- Data Collection: Gathering data through various methods such as questionnaires, interviews, and usage analytics to assess how the applications are used and perceived.
- Feedback Gathering: Actively collecting feedback from users on their experiences, challenges, and suggestions for improvement.

The piloting procedures are designed to ensure a thorough and effective evaluation of the AI4EDU applications, Teacher Mate and Study Buddy. The design and planning phase includes several key steps:

- Selection of Pilot Sites: Identifying diverse educational settings across different countries and educational levels to ensure a wide range of user experiences.
- Participant Recruitment: Enlisting schools, teachers and students who will use and evaluate the applications, ensuring representation from various demographic and educational backgrounds.
- Training and Orientation: Providing participants with the necessary training and resources to use the AI4EDU applications effectively, including detailed guides and support sessions.
- Pilot Implementation Plan: Developing a detailed timeline and procedure for the pilot testing, including the duration of use, data collection schedules, and feedback mechanisms.

5.1. Pilot Timeline

In preparation for the AI4EDU project's extensive pilot implementation, a timeline has been set to ensure a smooth deployment of the Teacher Mate and Study Buddy tools. The timeline spans to four Phases which are described in Table 3.

Table 3. Pilot phases and timeline

Implementation Phase	Time frame	Activities
Phase 1: Preparation and Tool Deployment (Feb 2024)	February 1-23	Finalize the development of the Teacher Mate and Study Buddy tools. Conduct internal testing and quality assurance. Finalize training materials for teachers and students.
Phase 2: Training and Release (Feb 19 - March 1)	February 26 - March 1	Conduct training sessions for teachers on tool usage. Training sessions for students on how to interact with Study Buddy.
Phase 3: Pilot Implementation (March - April 2024)	March 4	Full-scale pilot implementation begins.
	March 4 - April 25	Conduct eight pilot sessions, two in each country, with one subject per session.
Session	**Date**	**Country**
1 – Citizenship & Sustainability	4/3 - 8/3	Ireland (DEC)
2 - Biology	11/3 - 15/3	Sweden (LTU)
3 – Biology	18/3 - 22/3	Cyprus (UCY & CPI)
4 - Biology	26/3 - 29/3	Greece (EA)
5 – History	1/4 - 5/4	Cyprus (CPI)
6 – History	8/4 - 12/4	Greece (EA)
7 – History	15/4 - 19/4	Sweden (LTU)
8 – Civil Education	22/4 - 26/4	Ireland (DEC)
Phase 4: Analysis and Reporting (April - June 2024)	April 29 - May 17	Gather and analyze data from completed pilots.
	May 20 - May 31	Synthesize pilot results and generate preliminary insights.
	June 3 – June 7	Produce the TOC & Initial Draft of the Deliverable D4.2
	June 10 - June 14	Refine the Deliverable D4.2, incorporate feedback, and finalize findings.
	June 17 - June 29	Produce Final version of the Deliverable D4.2

Phase 1, running from February 1 to 23, focuses on finalizing tool development, conducting internal testing, and ensuring the quality of the tools. Simultaneously, efforts are made to complete training materials for teachers and students. This thorough preparation lays the foundation for the subsequent phases, highlighting the project's commitment to readiness.

Moving to Phase 2, taking place from February 19 to March 1, the emphasis shifts to training and the official release of the tools. From February 26 to March 1, dedicated training sessions are held for teachers, providing them with the necessary knowledge and skills for effective tool use. Concurrently, students go through training sessions to understand how to interact with the Study Buddy tool. This phase acts as a crucial link, fostering familiarity and competence among educators and students.

Entering March, Phase 3 marks the start of the full-scale pilot implementation on March 4, a highly anticipated milestone in the project. Over the subsequent eight weeks, from March 4 to April 25, a series of pilot sessions will unfold, with two sessions scheduled in each participating country, focusing on a specific subject per session.

The organized schedule ensures a comprehensive and diversified evaluation across various educational contexts.

As the pilot sessions progress, Phase 4, spanning from April to June 2024, takes center stage, delving into critical aspects of analysis and reporting. Starting from April 29 to May 17, the project team diligently gathers and scrutinizes data from completed pilot sessions.

Following this, between May 20 and May 31, the synthesis of pilot results occurs, generating preliminary insights that lay the foundation for subsequent deliverables.

June brings a crucial juncture with a series of activities dedicated to producing the project's Deliverable D4.2.

From June 3 to June 7, the team generates the Table of Contents and an initial draft of the Deliverable D4.2. Subsequently, between June 10 and June 14, the focus shifts to refining Deliverable D4.2, incorporating valuable feedback from stakeholders, and crystallizing the project's findings.

The closing days of June, from June 17 to June 29, witness the culmination of this exhaustive process with the production of the final version of Deliverable D4.2.

The pilot phases and timeline are illustrated in Figure 1.

Figure 1: Pilot phases and timeline

5.2. Piloting Protocol

In this section a comprehensive Pilot Implementation Protocol is presented. This protocol is created in the form of a handbook addressed to the project team members who will be involved in piloting activities of WP4, aiming to ensure everyone's adherence to common methodological principles and uniformity of pilot implementation across countries and partners.

INTRODUCTION

Welcome to the AI4EDU Pilot Implementation Protocol, a comprehensive guide designed to ensure a seamless and effective deployment of the Teacher Mate and Study Buddy in real educational settings.

This protocol outlines the steps, methodologies, and evaluation criteria to be followed by facilitators, teachers, and students involved in the pilot phase.

The evaluation process encompasses usability aspects and technology acceptance to gather valuable insights into the performance, user experience, and acceptance of the AI-driven educational tools. By adhering to this protocol, facilitators and participants will contribute valuable data and feedback that will inform the refinement and enhancement of the Teacher Mate and Study Buddy, ensuring their effectiveness and usability in diverse educational settings.

Thank you for your dedication to the AI4EDU project, and we look forward to a successful pilot implementation.

STEP 1 - ARRANGE THE DATE, THE DURATION AND THE PLACE

The initial step for AI4EDU implementation involves scheduling meetings with school administrators and relevant colleagues participating in the pilot.

It is essential to coordinate a specific date and venue where students can engage with the AI-driven educational tools.

Consideration should be given to allocating two school hours (90 minutes) for optimal participation.

In the event that only a one-hour session is feasible, a subsequent session can be arranged, as the AI4EDU tools seamlessly record data from one session to another.

The target demographic for this initiative is students aged between 11 and 16. It is crucial to emphasize that, for continuity across multiple sessions, students (not teachers) must retain their usernames and passwords. This ensures a seamless transition and consistent data tracking as participants progress through subsequent sessions.

STEP 2 - GATHERING CONSENT FORMS

The AI4EDU project requires explicit consent from both students and their parents or guardians, as well as for teachers, for the collection and processing of data. Through this procedure the AI4EDU project is committed to implement an ethical approach to all project activities which involve data collection, with the aim to foster transparency and ensure respect to the rights of students and teachers. This protocol outlines the steps to ensure compliance and understanding.

2.1. Consent Documents Overview

Provide documents explaining the project's objectives and the use of collected data. Documents include Participants Information Sheet and Informed Consent Form.

2.2. Dual Consent Approach

Regardless of national legal regulations on children's consent, both parental and child's consent are mandatory.

Even if a child could legally consent independently, an additional layer of parental consent adds a safeguard and is often legally required.

2.3. Explanation in Simple Terms

Communicate the content of the consent forms in straightforward language. Offer oral explanations to ensure understanding, allowing students to ask questions for clarification.

2.4. Visual Facilitation

Encourage the use of visual aids or other facilitators to enhance comprehension, especially for younger participants. Visual elements can simplify complex information and make it more accessible.

2.5. Opportunity for Questions

Provide a platform for students to ask questions about the consent forms. Address any concerns or uncertainties to ensure informed decision-making.

2.6. Template Nature of Consent Forms

Emphasize that consent forms are templates and not ready for immediate use. Fields must be completed, and forms must be translated into the language understood by the target group.

2.7. Adaptations and Changes

Acknowledge that small changes or adaptations may be necessary based on specific situations. Any modifications must be reviewed and approved by responsible members of the AI4EDU consortium.

STEP 3 - Introduction, User Manual and Training Scenarios Distribution
To ensure a structured and informative process for introducing users to the AI4EDU tools, we need to set a solid foundation for the pilot implementation. **3.1 Introduction Session:** Begin the pilot session with a short introduction to the AI4EDU project, emphasizing the objectives and characteristics of the Teacher Mate and Study Buddy applications in the educational context. **3.2 User Manuals Distribution:** Provide each participating teacher with a copy of the Teacher Mate User Manual. Distribute Study Buddy User Manuals to all students involved in the pilot. **3.3 Training Scenarios Overview:** Dedicate a segment to explain the training scenarios included in both Teacher Mate and Study Buddy. Highlight the objectives and expected learning outcomes for teachers and students. **3.4 Interactive Demonstration:** Conduct an interactive demonstration of the key features of Teacher Mate for teachers. Simultaneously, guide students through a demonstration of Study Buddy functionalities. **3.5 Hands-on Practice:** Allow teachers to engage in hands-on practice with Teacher Mate, navigating through various scenarios. Encourage students to explore Study Buddy and interact with the application during this training phase. **3.6 Q&A Session:** Facilitate a question-and-answer session to address any queries or concerns from both teachers and students regarding the applications. **3.7 Distribution of Materials:** Hand out physical copies or provide digital access to the training scenarios that align with the subjects and grades involved in the pilot. **3.8 Clarification on Usage:** Emphasize the importance of adhering to the usage guidelines outlined in the manuals and training materials. Encourage teachers and students to seek clarification on any aspects that may seem unclear. **3.9 Feedback Mechanism:** Establish a feedback mechanism for continuous communication throughout the pilot phase. Encourage users to report any challenges or share positive experiences. **3.10 Reminders for Next Sessions:** Remind participants to retain their usernames and passwords for subsequent sessions, emphasizing the need for consistency in data tracking.

STEP 4 - Software & Hardware Setup

AI4EDU Tools Access Guide for PCs:

To facilitate the pilot sessions, the AI4EDU tools, Teacher Mate and Study Buddy, can be easily accessed through a web application. The setup process involves the following steps:

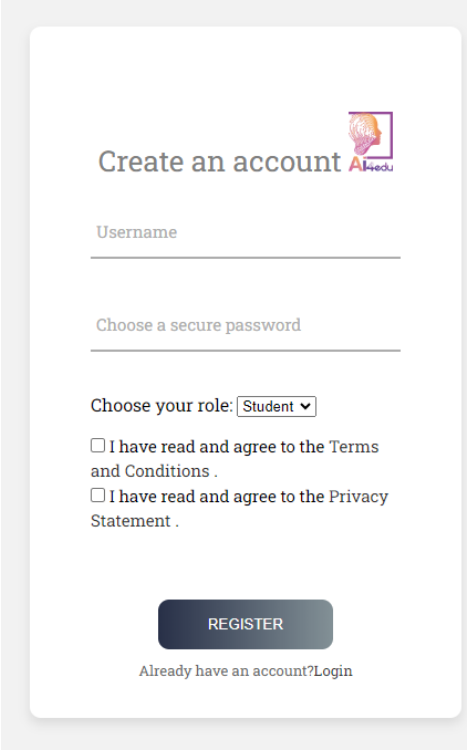
4.1. Access the Provided Link: Athena Research Center will share a direct link to access the AI4EDU web application.

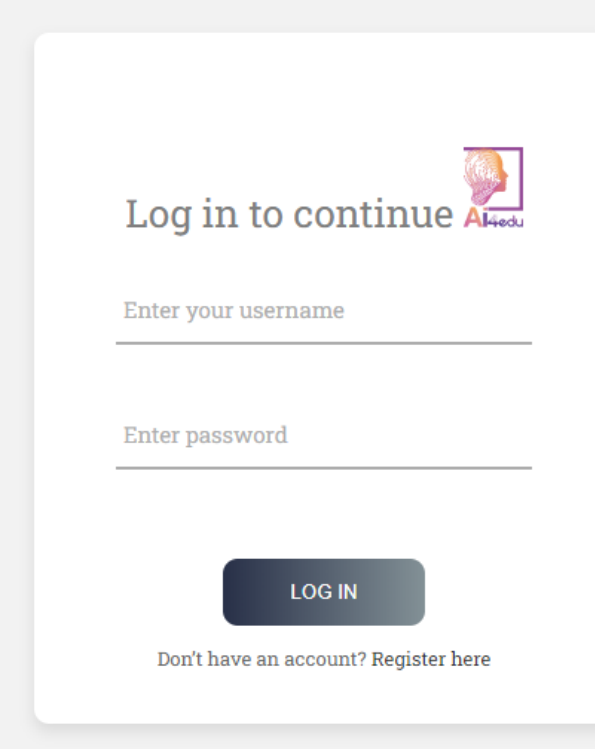
4.2. Open the Web Browser: Launch the web browser on the designated PCs.

4.3. Navigate to the AI4EDU Web Application: Type or paste the provided link into the browser's address bar. Press Enter to navigate to the AI4EDU web application.

4.4. Create Shortcuts (Optional): For convenience, consider creating desktop shortcuts for quick access to the Teacher Mate and Study Buddy.
Right-click on the webpage and select "Create Shortcut" for each tool.

4.5. Access Credentials: After completing the registration form, students will receive credentials for logging into the AI4EDU tools.
Students need to remember or securely store these credentials.





4.6. Minimum System Requirements: Ensure that the PCs or laptops meet the following minimum specifications for optimal performance of the AI4EDU web application: Web Browser: Use a modern and updated web browser such as Google Chrome, Mozilla

Firefox, or Microsoft Edge. Internet Connection: A stable internet connection is required for seamless access.

STEP 5 - AI4EDU Introduction and Consent Explanation Protocol
At the start of each session, it is crucial to provide a concise introduction to the AI4EDU project and explain the process that participants will undergo. Utilize the following statements: **5.1. Introduction to AI4EDU Concept:** "You are about to engage with an interactive educational tool developed as part of the AI4EDU project. This web application, designed for both educators and students, plays a key role in advancing education through innovative technology." **5.2. Consent Form Acknowledgment:** "To participate in this session, we requested your consent. Your willingness to engage with the AI4EDU tools is vital to the success of this educational initiative." **5.3. Honesty in Interaction:** "As part of the research, we kindly ask for your sincere and thoughtful interaction with the AI4EDU tools. Your genuine engagement contributes significantly to the insights we gather for educational improvement." **5.4. Real-life Scenarios in the Application:** "When navigating through different aspects of the application, approach it as you would real-life educational scenarios. Your authentic interactions help shape the effectiveness of AI4EDU in practical learning experiences." **5.5. Time Consideration:** "This introductory segment should not exceed 10 minutes, ensuring a smooth transition into the educational application experience." **5.6. Privacy Note: "**While interacting with the AI4EDU tools you are strongly advised not to include any of your or other individuals' personal data or information that may reveal your or other individuals' identity." **5.7. Important Note:** "Throughout the interaction, be attentive to any signs of discomfort. Emphasize the importance of reporting such instances at both the beginning and end of the session to teachers, parents, or other trusted individuals."

STEP 6A - Registration Process for Teachers (to the Teacher Mate)
Follow these simple steps to create your AI4EDU account: **6A.1. Visit the Registration Page:** Go to the registration page using the following link: [*AI4EDU Registration link*]. **6A.2. Account Information:** Choose a unique and easy-to-remember username. You are advised not to use your actual name. Create a secure password to protect your account. **6A.3. Role Selection:** Select your role as a Teacher from the options provided. **6A.4. Terms and Conditions:** Read and agree to the Terms and Conditions by checking the corresponding box. **6A.5. Privacy Statement:** Read and agree to the Privacy Statement by checking the corresponding box. **6A.6. Registration:** Click on the REGISTER button to complete the registration process. **6A.7. Already Registered? Login:** If you already have an account, click on Login. You are now all set to explore the AI4EDU tools tailored for educators. If you come across any challenges or have inquiries, don't hesitate to reach out to the AI4EDU team or your designated support channels. Happy teaching!

STEP 6B - Registration Process for Students (to the Study Buddy)
Follow these simple steps to create your AI4EDU account: **6B.1. Visit the Registration Page:** Go to the registration page using the following link: [*AI4EDU Registration link*]. **6B.2. Account Information:** Use the username and password provided to you. **6B.3. Role Selection:** Select your role as a Student from the provided options. **6B.4. Terms and Conditions:** Read and agree to the Terms and Conditions by checking the corresponding box. **6B.5. Privacy Statement:** Read and agree to the Privacy Statement by checking the corresponding box. **6B.6. Registration:** Click on the REGISTER button to complete the registration process. **6B.7. Already Registered? Login:** If you already have an account, click on Login. That's it! You are now ready to explore and engage with the AI4EDU tools. If you encounter any issues or have questions, feel free to reach out to your teachers or any support provided by the AI4EDU team. Happy learning!

STEP 7A -Implementing the Teacher Mate Scenarios
7A.1. Scenario Overview: Begin by presenting an overview of the Teacher Mate scenarios to participating teachers. Highlight the specific learning objectives and outcomes associated with each scenario. **7A.2 Distribution of Scenarios:** Provide teachers with printed or digital copies of the Teacher Mate scenarios relevant to the selected subjects and grade levels. Ensure clarity on the sequence of scenarios. **7A.3. Guidance on Integration:** Guide teachers on how to seamlessly integrate the scenarios into their existing curriculum. Emphasize the role of Teacher Mate as a supplementary tool to enhance the teaching experience. **7A.4. Subject-Specific Engagement:** Encourage teachers to customize their approach based on the subject, following the provided use-case scenarios. **7A.5. Interactive Sessions:** Promote interactive sessions where teachers actively engage with the scenarios, fostering discussions and encouraging them to explore real class applications. **7A.6. Data Collection Guidance:** Guide Teachers on the proper way to interact with the Teacher Mate, ensuring that their responses contribute valuable data for evaluation. Emphasize the confidentiality of their input. **7A.7. Continuous Support:** Establish a support system for teachers to seek assistance in case of technical issues or uncertainties about using the Teacher Mate. Encourage a collaborative learning environment. **7A.8. Data protection**: Ensure teachers that the data they provide will be strictly used for research and development purposes within the scope of the AI4EDU project and that the project consortium adheres to EU regulations and standards for the protection of their data privacy. Moreover, strongly advise them not to include any of their own or other individuals' personal data or information that may reveal their own or other individuals' identity.

STEP 7B -Implementing the Study Buddy Scenarios
7B.1. Scenario Overview: Introduce the Study Buddy scenarios to students, emphasizing the interactive and engaging nature of the application. Clearly outline the learning goals associated with each scenario. **7B.2. Distribution of Scenarios:** Distribute printed or digital copies of the Study Buddy scenarios to students. Ensure that each student has access to the relevant scenarios corresponding to their grade and subject. **7B.3. User Registration:** Remind students to use their registered usernames and passwords to access Study Buddy. Provide support for any login issues during this phase. **7B.4. Interactive Exploration:** Facilitate sessions where students can explore Study Buddy independently. Encourage them to interact with the AI, ask questions, and delve into the scenarios. **7B.5. Encouraging Real-Life Responses:** Emphasize the importance of responding to scenarios as they would in real-life situations. Encourage genuine reactions and thoughtful engagement. **7B.6. Data Collection Guidance:** Guide students on the proper way to interact with Study Buddy, ensuring that their responses contribute valuable data for evaluation. Emphasize the confidentiality of their input. **7B.7. Continuous Support:** Establish a support system for students to seek assistance in case of technical issues or uncertainties about using the Study Buddy. Encourage a collaborative learning environment. **7B.8. Data protection**: Ensure students that the data they provide will be strictly used for research and development purposes within the scope of the AI4EDU project and that the project consortium adheres to EU regulations and standards for the protection of their data privacy. Moreover, strongly advise them not to include any of their own or other individuals' personal data or information that may reveal their own or other individuals' identity.

STEP 8A - Gathering Feedback from teachers
8A.1. Usability: Guide teachers to fill in the Usability Questionnaire (Follow the link found at the Teacher Mate) **8A.2. Technology Acceptance:** Guide teachers to fill in the TAM Questionnaire (Follow the link found at the Teacher Mate) **8A.3. Qualitative Feedback:** Talk with teachers after the pilot to fill in the Qualitative Questionnaire

STEP 8B - Gathering Feedback from students
8B.1. Usability: Guide Students to fill in the Usability Questionnaire (Follow the link found at the Study Buddy) **8B.2. Technology Acceptance:** Guide Students to fill in the TAM Questionnaire (Follow the link found at the Study Buddy) **8B.3. Qualitative Feedback:** Talk with students after the pilot to fill in the Qualitative Questionnaire

References

AI4EDU Deliverable D2.1

AI4EDU Deliverable D2.2

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Appendix 1: Pilot Questionnaires

In this section we will present the types of questionnaires that will be used in all AI4EDU's pilots.

USABILITY Questionnaires

TEACHER MATE Usability Aspects	*Scale 1-5 (1 worst – 5 best)*
1. I think that I would like to use the Teacher Mate frequently.	
2. I found the Teacher Mate scenarios unnecessarily complex.	
3. I thought the Teacher Mate scenarios were easy to navigate.	
4. I think I would need the support of a facilitator/expert to be able to use the Teacher Mate.	
5. I found the functions in the Teacher Mate were well integrated.	
6. I thought there was too much inconsistency/confusion in the Teacher Mate.	
7. I would imagine that many other teachers would like to use the Teacher Mate.	
8. I found the Teacher Mate very awkward to use.	
9. I felt very confident using the Teacher Mate.	
10. I needed to learn a lot of things before I could get going with the Teacher Mate.	
11. I felt rather safe when using the Teacher Mate.	
12. I felt a bit stressed at various points when using the Teacher Mate.	

Study Buddy Usability Aspects	*Scale 1-5 (1 worst – 5 best)*
1. I think that I would like to use the Study Buddy frequently.	
2. I found the Study Buddy scenarios unnecessarily complex.	
3. I thought the Study Buddy scenarios were easy to navigate.	
4. I think that I would need the support of a facilitator/expert to be able to use the Study Buddy.	
5. I found the functions in the Study Buddy were well integrated.	
6. I thought there was too much inconsistency/confusion in the Study Buddy.	
7. I would imagine that many other students would like to use the Study Buddy.	
8. I found the Study Buddy very awkward to use.	
9. I felt very confident using the Study Buddy.	
10. I needed to learn a lot of things before I could get going with the Study Buddy.	
11. I felt rather safe when using the Study Buddy.	
12. I felt a bit stressed at various points when using the Study Buddy.	

TECHNOLOGY ACCEPTANCE Questionnaires

Technology Acceptance (Teacher Mate)

Indicate how you have perceived your actions towards the Teacher Mate using a 7-point Likert scale from 1 to 7 (1=strongly disagree, 7=strongly agree).

1. Effort Expectancy

EE1 My interaction with the Teacher Mate is clear and understandable.

EE2 It is easy for me to become skillful at using the Teacher Mate.

EE3 I find the Teacher Mate easy to use.

EE4 Learning to operate the various commands is easy for me.

2. Performance Expectancy

PE1 I find the Teacher Mate useful for my purposes (in my daily teaching practice).

PE2 Using the Teacher Mate enables me to know more about the subject that I am teaching

PE3 Using the Teacher Mate empowers me to become an efficient user of Artificial Intelligence

PE4 By using the Teacher Mate, the quality of my everyday teaching tasks will be improved.

3. Attitude Toward Using Technology

AT1 Using the Teacher Mate is a good idea.

AT2 Using the Teacher Mate makes online experience more interesting.

AT3 Using the Teacher Mate is fun.

AT4 I enjoy playing the Teacher Mate.

4. Social Influence

SI1 The school and teachers have been supporting us in using the Teacher Mate.

5. Facilitating Conditions

FC1 I have the necessary resources (PC, Mobile device, Internet Connection, Data) to use the Teacher Mate.

FC2 I have the necessary knowledge to use the Teacher Mate.

FC3 The Teacher Mate is compatible with other systems I use.

FC4 A specific person (or group) is available for assistance with difficulties when using the Teacher Mate.

6. Self-Efficacy

SE1 I could use the Teacher Mate, even if there was no one around to support me.

SE2 I could use the Teacher Mate, if I could call someone for help if I got stuck.

SE3 I could use the Teacher Mate, if I had a lot of time to get familiar with it.

7. Perceived Credibility

PC1 I believe my information is kept confidential, when using the Teacher Mate.

PC2 I believe it is safe to use the Teacher Mate.

8. Behavioural Intention

BI1 I intend to use the Teacher Mate in the next 6 months.

BI2 I predict I will use the Teacher Mate in the next 6 months.

BI3 I plan to use the Teacher Mate in the next 6 months.

Technology Acceptance (Study Buddy)

Indicate how you have perceived your actions towards the Study Buddy using a 7-point Likert scale from 1 to 7 (1=strongly disagree, 7=strongly agree).

1. **Effort Expectancy**

EE1 My interaction with the Study Buddy is clear and understandable.

EE2 It is easy for me to become skilful at using the Study Buddy.

EE3 I find the Study Buddy easy to use.

EE4 Learning to operate the various commands is easy for me.

2. **Performance Expectancy**

PE1 I find the Study Buddy useful for my purposes (in my daily homework).

PE2 Using the Study Buddy enables me to know more about the subjects that I am learning

PE3 Using the Study Buddy empowers me to become an efficient user of Artificial Intelligence

PE4 By using the Study Buddy, the quality of my everyday study will be improved.

3. **Attitude Toward Using Technology**

AT1 Using the Study Buddy is a good idea.

AT2 Using the Study Buddy makes online experience more interesting.

AT3 Using the Study Buddy is fun.

AT4 I enjoy playing the Study Buddy.

4. **Social Influence**

SI1 The school and teachers have been supporting us in using the Study Buddy.

5. **Facilitating Conditions**

FC1 I have the necessary resources (PC, Mobile device, Internet Connection, Data) to use the Study Buddy.

FC2 I have the necessary knowledge to use the Study Buddy.

FC3 The Study Buddy is compatible with other systems I use.

FC4 A specific person (or group) is available for assistance with difficulties when using the Study Buddy.

6. **Self-Efficacy**

SE1 I could use the Study Buddy, even if there was no one around to support me.

SE2 I could use the Study Buddy if I could call someone for help if I got stuck.

SE3 I could use the Study Buddy, if I had a lot of time to get familiar with it.

7. **Perceived Credibility**

PC1 I believe my information is kept confidential, when using the Study Buddy.

PC2 I believe it is safe to use the Study Buddy.

8. **Behavioral Intention**

BI1 I intend to use the Study Buddy in the next 6 months.

BI2 I predict I will use the Study Buddy in the next 6 months.

BI3 I plan to use the Study Buddy in the next 6 months.

QUALITATIVE Questionnaires

For the Teacher Mate

Having observed the teachers using the Teacher Mate, answer the following questions:	
Observing teachers	*Reactions*
1. All teachers participated in the process (by using the Teacher Mate).	
2. The group did not deviate from the Teacher Mate pilot aims	
3. The group seemed confused about the processes of the Teacher Mate Pilot.	
4. The group seemed confused about definitions/instructions in the Teacher Mate tool.	
5. The group adhered to the role assignments.	
6. The group seemed to understand the core concept and/or definitions of the Teacher Mate tool.	
7. Other observations	

For the Study Buddy

Having observed the students using the Study Buddy, answer the following questions:	
Observing students	*Reactions*
1. All students participated in the process (by using the Study Buddy).	
2. The group did not deviate from the Study Buddy pilot aims	
3. The group seemed confused about the processes of the Study Buddy Pilot.	
4. The group seemed confused about definitions/instructions in the Study Buddy tool.	
5. The group adhered to the role assignments.	
6. The group seemed to understand the core concept and/or definitions of the Study Buddy tool.	
7. Other observations	

Appendix 2: Information Sheets and Informed Consent Forms of Students, Parents/Guardians and Teachers [Templates]

Student information Sheet

Title:	**AI4EDU: Conversational AI assistant for teaching and learning**
Researchers:	**[Researcher Name],** ILSP/Athena R.C., [Role in the project]
Collaborating Bodies	Luleå Tekniska Universitet (Sweden), Ellinogermaniki Agogi (Greece), University of Cyprus (Cyprus), Cyprus Pedagogical Institute (Cyprus), Management Committee of Drumcondra Education Center (Ireland)
Funding authority:	European Commission, European Education and Culture Executive Agency (EACEA). Call: ERASMUS-EDU-2022-PI-FORWARD - Partnerships for Innovation - Forward Looking Projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: AI in education.

You have been invited to participate in a study conducted by [Researcher name], Researcher at the Athena Research Centre/Institute for Language and Speech Processing.

This document will give you all the necessary information you need, to understand why this study is taking place and why you have been invited to participate. It also describes what your participation means and what you should do. Please take as much time as you need to read it, think about it, and ask any questions you want either now or at some other time/at any time. If you decide to participate, you will be asked to sign this form and you will receive a copy.

1. What is the purpose of the study?

The purpose of this research project is:

- to develop and evaluate intelligent educational assistants, powered by AI technologies, which will be able to conversationally interact with students and to support teachers, making teaching and learning more engaging, flexible and effective.

- to investigate -in real educational settings- the ethical implications of the AI adoption for teaching and learning and to produce evidence-based recommendations addressed to the educational community for the ethical, transparent, inclusive, and equitable use of AI in education.

2. Who participates in the study/Why have I been invited?

Secondary school students participate in the study. You have been invited to use educational AI applications in activities related to various school subjects and to give us your opinion on their use, as well as information about your own needs and requirements from such applications. It's important for us to know the needs of end users so we can design our applications in a way that meets them. There are no special skills or knowledge you need to have to participate.

3. How do I participate in the study? What will I be asked to do?

You are invited to participate in a workshop addressed to students. In this workshop, you are invited to participate in the following activities, step by step:

A. Researchers will introduce you to AI technologies and their applications in education, with short talks, examples, and demonstrations of applications such as ChatGPT. (about 20 minutes)
B. You will be asked to use a conversational artificial intelligence application in activities related to various school subjects. This application uses the Chat GPT API [2]. As part of these activities you will interact with the chatbot by asking questions about topics from different school subjects and asking it to perform various school-related tasks, such as explaining a definition, asking for examples and clarifications, asking for information on a topic you are interested in, etc. (approx. 50 minutes)
C. At the end of the workshop you will be asked to fill in a questionnaire, with questions related to your experience using the chatbot, in order to evaluate its performance, its usability, its potential to support you in your learning goals and school tasks and suggest improvements. The questionnaire will not contain any of your personal data. You can skip any question you don't feel comfortable answering. (about 20 minutes)

4. Do I have any benefit from participating in the study?

Your participation will have no positive or negative impact on your school performance. With your participation you will have the opportunity to get acquainted with the most advanced artificial intelligence technologies, used in a conversational educational assistant for students. We hope that through your participation we will promote the acceptance of AI systems as learning assistants and help the educational community realize the human role in developing, using and improving AI applications.

5. Are there any risks or costs/charges involved in participating in the study?

No, there are no risks associated with your participation in the study. Your participation does not entail any cost or charge for you, beyond the time you will devote to your participation in it.

[2] ChatGPT is an artificial intelligence program designed to conduct conversations with users in text format, using natural language processing technologies to understand and respond to users' questions and answers.

6. Is it mandatory to participate?

Your participation in the above activities is completely voluntary. You can refuse to participate without any justification. However, if you agree to participate, please read carefully this Information Sheet and sign the Informed Consent Form. In order to be able to participate, another Informed Consent Form needs to be signed by your parents/guardians.

Even after you agree to participate, you can change your mind at any time and leave the study without any justification or excuse and without any consequences for you. In this case, you can request that the data and information we have collected from your participation destroyed. Your request to destroy the information you have given us can be satisfied at any time.

In case you wish to have your data or the information you have given us destroyed, you can contact [contact person name], member of the research team of the Institute for Language and Speech Processing / Athena Research Center, tel. [phone number], email: [email address], address: [postal address].

7. How will my privacy and personal data be safeguarded?

As part of the activities in which you are invited to take part, we will not collect any kind of personal data, such as your name, address and telephone number. To participate in the activities described above, you will be using the account credentials created for you, including a username and a password. Your real name will not be used in these credentials.

From the questionnaires you fill out, we will collect information about your school grade, gender and age.

In addition, we will collect your interactions with the conversational AI system developed in the project. This conversational system uses OpenAI's ChatGPT Application Programming Interface (ChatGPT API)[3]. The data collected using the ChatGPT API is subject to the terms of use of this program, which are available at https://openai.com/policies/terms-of-use. Under these terms, the content you provide or receive from the ChatGPT API is not used to develop and improve OpenAI's services.

During your interactions with the conversational AI system, we strongly recommend that you do not include personal data of yourself or others, or any other information that may reveal your identity or the identity of others. In any case, the data you give us will be checked by authorized researchers to confirm that it does not contain any personal information or information that may reveal your identity or the identity of other people. If such data exists, it will be anonymized in such a way that it is not possible to reveal your identity or the identity of other people to third parties. Also, your identity will not be revealed in possible publications, presentations or scientific reports resulting from this study.

The above information and data will be stored on secure computers that are password protected and block access by unauthorized users. Only members of the research team will have access to these computers.

[3] ChatGPT is an artificial intelligence program designed to conduct conversations with users in text format, using natural language processing technologies to understand and respond to users' questions and answers.

Your information and data will be retained for the duration of the project and, after their full anonymization, will be transferred to an archive for long-term storage after its completion.

The data you provide to us will be shared with the partners involved in the project activities for research and development purposes, in compliance with all secure access specifications.

The data and information you provide to us may be used in the future by Athena Research Center for research and development purposes. You can refuse their further use and processing by stating this on this form.

The data you will provide in your interactions with the conversational AI system will be included in publicly available data repositories, addressed to the research community, as part of the project results. These datasets will be free of personal information or information that may reveal your identity. You can refuse to make them available in free repositories by stating this on this form.

The results of this research are to be used in scientific publications, conference announcements, exhibitions, open science events, newsletters and social media posts for promotion to specific audience groups. In none of these cases will data revealing your identity be included.

During your participation in the study, photos will be taken and used on the website and social media of the project, for the purpose of promoting and disseminating its results. You can refuse to take photographs by stating this on this form.

8. Will I receive a fee for my participation?

No fee will be given for your participation in the study.

9. Who funds this research?

The research described in this information sheet is part of the project AI4EDU: Conversational AI assistant for teaching and learning, funded by the European Commission, European Education and Culture Executive Agency (EACEA), under the call ERASMUS-EDU-2022-PI-FORWARD - Partnerships for innovation – Forward-looking projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: Artificial intelligence in education. The overall project budget is 999.810 € and the EU contribution is 799.848 €. The coordinator of the project is the Athena Research Center. The duration of the project is 36 months, from 1/1/2023 to 31/12/2025.

10. Who has approved this research on Ethics?

The research has been approved by the Ethics Committee of the Athena Research Center under the number 19-25/05/2023.

11. Who can I contact for more information about the study?

For more information about the research, please contact [contact person's name], member of the research team, Institute of Language and Language Processing/Athena Research Center, telephone [phone number], email [email address], address: [postal address].

12. Where can I submit complaints?

For any complaints regarding your participation, you can contact the Ethics Committee of the Athena Research Center at the address ethics-sec@athenarc.gr.

For any complaint regarding the handling of your personal data, you may contact the Data Protection Officer of the Athena Research Center (dpo@athenarc.gr) and in any case the Personal Data Protection Authority (complaints@dpa.gr).

INFORMED CONSENT FORM FOR STUDENTS

Title:	**AI4EDU: Conversational AI assistant for teaching and learning**
Researchers:	**[Researcher Name],** ILSP/Athena R.C., [Role in the project]
Collaborating Bodies	Luleå Tekniska Universitet (Sweden), Ellinogermaniki Agogi (Greece), University of Cyprus (Cyprus), Cyprus Pedagogical Institute (Cyprus), Management Committee of Drumcondra Education Center (Ireland)
Funding authority:	European Commission, European Education and Culture Executive Agency (EACEA). Call: ERASMUS-EDU-2022-PI-FORWARD - Partnerships for Innovation - Forward Looking Projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: AI in education.

Please reply below to indicate your consent.

I have read and understood the content of the Information Sheet	YES	NO
I was given enough time to decide if I wanted to participate in this research.	YES	NO
I have received satisfactory explanations regarding the handling of my personal data	YES	NO
I understand that my participation is study, and I can leave at any time without explanation and without any consequences.	YES	NO
I understand that if I leave the study my data will be destroyed.	YES	NO
I understand that I can request at any time that the information I have provided as part of the study be destroyed.	YES	NO
I know who I can contact if I would like more information about the study	YES	NO
I know who I can contact for complaints	YES	NO
I understand what my rights are under the General Data Protection Regulation and I know who I can contact to exercise my rights	YES	NO
I agree to use a conversational AI system in educational activities, that uses the Application Programming Interface (ChatGPT API) in accordance with OpenAI's terms of use (https://openai.com/policies/terms-of-use)	YES	NO

I agree that photographs of my participation will be taken and used for the purpose of promoting and disseminating the results of the project	YES	NO
I agree that the fully anonymized data I will provide in the context of this study will be used in the future by the Athena Research Center for research and development purposes	YES	NO
I agree that the fully anonymised data I will provide in the context of this study will be made available in publicly available repositories, addressed to the research community, as part of the project results.	YES	NO

Participant Name:	
Postal address:	Phone/email:
Signature	**Date**
Name of investigator responsible:	
Signature	**Date**

Parent or guardian Information Sheet

Title:	**AI4EDU: Conversational AI assistant for teaching and learning**
Researchers:	**[Researcher Name],** ILSP/Athena R.C., [Role in the project]
Collaborating Bodies	Luleå Tekniska Universitet (Sweden), Ellinogermaniki Agogi (Greece), University of Cyprus (Cyprus), Cyprus Pedagogical Institute (Cyprus), Management Committee of Drumcondra Education Center (Ireland)
Funding authority:	European Commission, European Education and Culture Executive Agency (EACEA). Call: ERASMUS-EDU-2022-PI-FORWARD - Partnerships for Innovation - Forward Looking Projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: AI in education.

You have been invited to participate in a study conducted by [Researcher name], Researcher at the Athena Research Centre/Institute for Language and Speech Processing.

This document will give you all the necessary information you need, to understand why this study is taking place and why you have been invited to participate. It also describes what your participation means and what you should do. Please take as much time as you need to read it, think about it, and ask any questions you want either now or at some other time/at any time. If you decide to participate, you will be asked to sign this form and you will receive a copy.

1. What is the purpose of the study?

The purpose of this research project is:

- to develop and evaluate intelligent educational assistants, powered by AI technologies, which will be able to conversationally interact with students and to support teachers, making teaching and learning more engaging, flexible and effective.
- to investigate -in real educational settings- the ethical implications of the AI adoption for teaching and learning and to produce evidence-based recommendations addressed to the educational community for the ethical, transparent, inclusive, and equitable use of AI in education.

2. Who participates in the study? Why is my child/ward invited?

Secondary school students participate in the study. Your child/ward has been invited to use educational AI applications in activities related to various school subjects and to give us her/his opinion on their use, as well as information about her/his own needs and requirements from such applications. It's important for us to know the needs of end users so we can design our applications in a way that meets them. There are no special skills or knowledge your child/ward need to have to participate.

3. How will my child / ward participate in the study? What will she/he be asked to do?

Your child/ward is invited to participate in a workshop addressed to students. In this workshop, she/he is invited to participate in the following activities, step by step:

A. Researchers will introduce students to AI technologies and their applications in education, with short talks, examples, and demonstrations of applications such as ChatGPT. (about 20 minutes)
B. Your child/ward will be asked to use a conversational artificial intelligence application in activities related to various school subjects. This application uses the Chat GPT API [4]. As part of these activities she/he will interact with the chatbot by asking questions about topics from different school subjects and asking it to perform various school-related tasks, such as explaining a definition, asking for examples and clarifications, asking for information on a topic she/he is interested in, etc. (approx. 50 minutes)
C. At the end of the workshop she/he will be asked to fill in a questionnaire, with questions related to her/his experience using the chatbot, in order to evaluate its performance, its usability, its potential to support you in your learning goals and school tasks and suggest improvements. The questionnaire will not contain any of her/his personal data. She/he can skip any question she/he does not feel comfortable answering. (about 20 minutes)

4. Does my child/ward have any benefit from participating in the study?

Her/his participation will not have any positive or negative impact on her/his school performance. With her/his participation she/he will have the opportunity to get acquainted with the most advanced artificial intelligence technologies, used in an interactive educational assistant for students. We hope that through her/his participation we will promote the acceptance of AI systems as learning assistants and help the educational community realize the human role in developing, using and improving AI applications.

5. Are there any risks or costs/charges involved in my child's/ward's participation in the study?

No, there are no risks associated with her/his participation in the study. Her/his participation does not entail any cost or burden for her/him, beyond the time she/he will devote to her/his participation in it.

6. Is it mandatory to participate?

[4] ChatGPT is an artificial intelligence program designed to conduct conversations with users in text format, using natural language processing technologies to understand and respond to users' questions and answers.

Participation in the study is entirely voluntary. Your child/ward may refuse to participate without any justification. However, if you consent to her/his participation, please read carefully this Information Sheet and sign the Informed Consent Form.

Even after you agree for her/his participation, you can change your mind at any time and your child/ward can withdraw from the study without any justification or excuse and without any consequences for her/him. In this case you can request that the data and information we have collected from her/him be destroyed. Your request to destroy the information your child/guardian has given us can be granted at any time.

In case you wish to have your child's/ward's data or the information she/he have given us destroyed, you can contact [contact person name], member of the research team of the Institute for Language and Speech Processing / Athena Research Center, tel. [phone number], email: [email address], address: [postal address].

7. How will the privacy of my child/ward and her/his personal data be safeguarded?

As part of the activities in which she/he is invited to take part, we will not collect any kind of personal data, such as her/his name, address and telephone number. To participate in the activities described above, she/he will be using the account credentials created for her/him, including a username and a password. Her/his real name will not be used in these credentials.

From the questionnaires she/he will complete, we will collect information about her/his school grade, gender and age.

In addition, we will collect her/his interactions with the conversational AI system developed in the project. As mentioned above, this conversational system uses OpenAI's ChatGPT Application Programming Interface[5] (ChatGPT API). The data collected using the ChatGPT API is subject to the terms of use of this program, which are available at https://openai.com/policies/terms-of-use. Under these terms, the content that the user provides or receives from the ChatGPT API is not used to develop and improve OpenAI's services.

During her/his interactions with the conversational AI system, we strongly recommend that she/he does not include her/his personal data or any information of her/his own or other individuals' that may reveal her/his identity or the identity of others. In any case, the data she/he gives us will be checked by authorized investigators to confirm that they do not contain personal information or information that may reveal her/his identity or the identity of other individuals. If such data exists, they will be anonymized in such a way that it is not possible to reveal her/his identity or the identity of other individuals to third parties. Also, her/his identity will not be revealed in possible publications, presentations or scientific reports resulting from this study.

The above information and data will be stored on secure computers that are protected by passwords and block access by unauthorized users. Only members of the research team will have access to these computers.

[5] ChatGPT is an artificial intelligence program designed to conduct conversations with users in text format, using natural language processing technologies to understand and respond to users' questions and answers.

Her/his information and data will be retained for the duration of the project and, after their full anonymization, will be transferred to an archive for long-term storage after its completion.

The data provided to us will be shared with the partners involved in the project activities for research and development purposes, in compliance with all secure access specifications.

The data and information provided to us may be used in the future by Athena Research Center for research and development purposes. You may object to their further use and processing by stating this in this form.

The data provided in your child's/ward's interactions with the conversational AI system will be included in publicly available data repositories, addressed to the research community, as part of the project results. These datasets will contain completely anonymous, free from personal information or information that may reveal his or her identity. You can refuse to make them available in free repositories by stating this in this form.

The results of this research are to be used in scientific publications, conference announcements, exhibitions, open science events, newsletters and social media posts for promotion to specific audience groups. In none of these cases will data revealing your child's/ward's identity be included.

During her/his participation in the research, photographs will be taken which will be used on the project's website and social media, for the purpose of promoting and disseminating its results. You can refuse to take photographs by stating this on this form.

8. Will my child/ward receive any remuneration for her/his participation?

No remuneration will be given for her/his participation in the study.

9. Who funds this research?

The research described in this information sheet is part of the project AI4EDU: Conversational AI assistant for teaching and learning, funded by the European Commission, European Education and Culture Executive Agency (EACEA), under the call ERASMUS-EDU-2022-PI-FORWARD - Partnerships for innovation – Forward-looking projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: Artificial intelligence in education. The overall project budget is 999.810 € and the EU contribution is 799.848 €. The coordinator of the project is the Athena Research Center. The duration of the project is 36 months, from 1/1/2023 to 31/12/2025.

10. Who has approved this research on Ethics?

The research has been approved by the Ethics Committee of the Athena Research Center under the number 19-25/05/2023.

11. Who can I contact for more information about the study?

For more information about the research, please contact [contact person's name], member of the research team, Institute of Language and Language Processing/Athena Research Center, telephone [phone number], email [email address], address: [postal address].

12. Where can I submit complaints?

For any complaints regarding the involvement of your child / ward, you can contact the Ethics Committee of the Athena Research Center at the address ethics-sec@athenarc.gr.

For any complaint regarding the handling of your child's / ward's personal data, you may contact the Data Protection Officer of the Athena Research Center (dpo@athenarc.gr) and in any case the Personal Data Protection Authority (complaints@dpa.gr).

INFORMED CONSENT FORM FOR PARENTS/GUARDIANS

Title:	**AI4EDU: Conversational AI assistant for teaching and learning**
Researchers:	**[Researcher Name],** ILSP/Athena R.C., [Role in the project]
Collaborating Bodies	Luleå Tekniska Universitet (Sweden), Ellinogermaniki Agogi (Greece), University of Cyprus (Cyprus), Cyprus Pedagogical Institute (Cyprus), Management Committee of Drumcondra Education Center (Ireland)
Funding authority:	European Commission, European Education and Culture Executive Agency (EACEA). Call: ERASMUS-EDU-2022-PI-FORWARD - Partnerships for Innovation - Forward Looking Projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: AI in education.

Please reply below to indicate your consent.

I have read and understood the content of the Information Sheet	YES	NO
I was given enough time to decide if I wanted my child/ward to participate in this research.	YES	NO
I have received satisfactory explanations regarding the handling of my child's / my ward's personal data	YES	NO
I understand that the participation of my child/ward is voluntary and that she/he can leave at any time without explanation and without any consequences.	YES	NO
I understand that if she/he leaves the study her/his data will be destroyed.	YES	NO
I understand that I can request at any time that the information provided by my child/ward as part of the study be destroyed.	YES	NO
I know who I can contact if I would like more information about the study	YES	NO
I know who I can contact for complaints	YES	NO
I understand what my child's/ward's rights are under the General Data Protection Regulation and I know who I can contact to exercise her/his rights	YES	NO
I agree that my child / guardian will use a conversational AI system in educational activities, that uses the ChatGPT Application Programming Interface (ChatGPT API) in accordance with OpenAI's terms of use (https://openai.com/policies/terms-	YES	NO

of-use)

I agree that photographs of her/his participation in the study will be taken and used for the purpose of promoting and disseminating the results of the project	YES	NO
I agree that the fully anonymized data provided by my child / ward in the context of this study will be used in the future by the Athena Research Center for research and development purposes	YES	NO
I agree that the fully anonymized data provided by my child / wars in the context of this study will be made available in publicly available repositories, addressed to the research community, as part of the project results.	YES	NO

Parent/guardian name:	
Participant name:	
Postal address:	Phone/email:
Signature	**Date**
Name of investigator responsible:	
Signature	**Date**

Teacher Information Sheet

Title:	**AI4EDU: Conversational AI assistant for teaching and learning**
Researchers:	**[Researcher Name],** ILSP/Athena R.C., [Role in the project]
Collaborating Bodies	Luleå Tekniska Universitet (Sweden), Ellinogermaniki Agogi (Greece), University of Cyprus (Cyprus), Cyprus Pedagogical Institute (Cyprus), Management Committee of Drumcondra Education Center (Ireland)
Funding authority:	European Commission, European Education and Culture Executive Agency (EACEA). Call: ERASMUS-EDU-2022-PI-FORWARD - Partnerships for Innovation - Forward Looking Projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: AI in education.

You have been invited to participate in a study conducted by [Researcher name], Researcher at the Athena Research Centre/Institute for Language and Speech Processing.

This document will give you all the necessary information you need, to understand why this study is taking place and why you have been invited to participate. It also describes what your participation means and what you should do. Please take as much time as you need to read it, think about it, and ask any questions you want either now or at some other time/at any time. If you decide to participate, you will be asked to sign this form and you will receive a copy.

1. What is the purpose of the study?

The purpose of this research project is:

- to develop and evaluate intelligent educational assistants, powered by AI technologies, which will be able to conversationally interact with students and to support teachers, making teaching and learning more engaging, flexible and effective.
- to investigate -in real educational settings- the ethical implications of the AI adoption for teaching and learning and to produce evidence-based recommendations addressed to the educational community for the ethical, transparent, inclusive, and equitable use of AI in education.

2. Who participates in the study? Why have I been invited?

Secondary school teachers participate in the study. You have been invited to use educational AI applications in activities related to the teaching of various school subjects

and to give us your opinion on their use, as well as information about your own needs and requirements from similar applications. It's important for us to know the needs of end users so we can design our apps in a way that meets them. There are no special skills or knowledge you need to have to participate.

3. How do I participate in the study? What will I be asked to do?

You are invited to participate in a workshop addressed to teachers. In this workshop, you are invited to participate in the following activities, step by step:

A. Researchers will introduce you to AI technologies and their applications in education, with short talks, examples, and demonstrations of applications such as ChatGPT. (about 20 minutes)
B. You will be asked to use a conversational artificial intelligence application in activities related to various school subjects. This application uses the Chat GPT API [6]. As part of these activities you will interact with the chatbot by asking questions about topics from different school subjects and asking it to perform various teaching-related tasks, such as explaining a definition, asking for examples and clarifications, asking for information on a topic you are interested in, creating lesson plans etc. (approx. 50 minutes)
C. You will be asked to rate a sample of the responses of the conversational AI system against a set of evaluation criteria, such as accuracy, relevance, clarity, completeness, reliability and language correctness. (approx. 45 minutes)
D. At the end of the workshop you will be asked to fill in a questionnaire, with questions related to your experience using the chatbot, in order to evaluate its performance, its usability, its potential to support you in your teaching goals and tasks and suggest improvements. The questionnaire will not contain any of your personal data. You can skip any question you don't feel comfortable answering. (about 20 minutes)

4. Do I have any benefit from participating in the study?

Your participation will have no positive or negative impact on your educational or teaching tasks. With your participation you will have the opportunity to get acquainted with the most advanced artificial intelligence technologies, used in educational assistants for students and teachers. We hope that through your participation we will promote the acceptance of AI systems as teaching and learning assistants and help the educational community realize the human role in developing, using and improving AI applications.

5. Are there any risks or costs/charges involved in participating in the study?

No, there are no risks associated with participating in the study. Your participation does not entail any cost or charge for you, beyond the time you will devote to your participation in it.

6. Is it mandatory to participate?

Your participation in the above activities is completely voluntary. You can refuse to participate without any justification. However, if you agree to participate, please read carefully this Information Sheet and sign the Informed Consent Form.

[6] ChatGPT is an artificial intelligence program designed to conduct conversations with users in text format, using natural language processing technologies to understand and respond to users' questions and answers.

Even after you agree to participate, you can change your mind at any time and leave the study without any justification or excuse and without any consequences for you. In this case, you can request that the data and information we have collected about you be destroyed. Your request to destroy the information you have provided to us can be satisfied at any time.

In case you wish to have your data or the information you have given us destroyed, you can contact [contact person name], member of the research team of the Institute for Language and Speech Processing / Athena Research Center, tel. [phone number], email: [email address], address: [postal address].

7. How will my privacy and personal data be safeguarded?

As part of the activities in which you are invited to take part, we will not collect any kind of personal data, such as your name, address and telephone number. To participate in the activities described above, you will be asked to create an account with the AI application, providing a username and login password. We recommend that you do not use your real name as your username in the app.

From the questionnaires you will complete, we will collect information about the school grades and subjects you are teaching, as well as your gender, age and your teaching experience in years.

In addition, we will collect your interactions with the conversational AI system developed in the project. As mentioned above, this conversational system uses OpenAI's ChatGPT Application Programming Interface (ChatGPT API)[7]. The data collected using the ChatGPT API is subject to the terms of use of this program, which are available at https://openai.com/policies/terms-of-use. Under these terms, the content you provide or receive from the ChatGPT API is not used to develop and improve OpenAI's services.

During your interactions with the conversational AI system, we strongly recommend that you do not include personal data of yourself or others, or any other information that may reveal your identity or the identity of others. In any case, the data you give us will be checked by authorized researchers to confirm that it does not contain any personal information or information that may reveal your identity or the identity of other people. If such data exists, it will be anonymized in such a way that it is not possible to reveal your identity or the identity of other people to third parties. Also, your identity will not be revealed in possible publications, presentations or scientific reports resulting from this study.

The above information and data will be stored on secure computers that are password protected and block access by unauthorized users. Only members of the research team will have access to these computers.

Your information and data will be retained for the duration of the project and, after their full anonymization, will be transferred to an archive for long-term storage after its completion.

The data you provide to us will be shared with the partners involved in the project activities for research and development purposes, in compliance with all secure access specifications.

[7] ChatGPT is an artificial intelligence program designed to conduct conversations with users in text format, using natural language processing technologies to understand and respond to users' questions and answers.

The data and information you provide to us may be used in the future by Athena Research Center for research and development purposes. You may object to their further use and processing by stating this in this form.

The data you will provide in your interactions with the conversational AI system will be included in publicly available data repositories, addressed to the research community, as part of the project results. These datasets will contain fully anonymized, free of personal information or information that may reveal your identity. You can refuse to make them available in free repositories by stating this in this form.

The results of this research are to be used in scientific publications, conference announcements, exhibitions, open science events, newsletters and social media posts for promotion to specific audience groups. In none of these cases will data revealing your identity be included.

During your participation in the study, photos will be taken and used on the website and social media of the project, for the purpose of promoting and disseminating its results. You can refuse to take photographs by stating this on this form.

8. Will I receive a fee for my participation?

You will not receive any remuneration for participating in the study.

9. Who funds this research?

The research described in this information sheet is part of the project AI4EDU: Conversational AI assistant for teaching and learning, funded by the European Commission, European Education and Culture Executive Agency (EACEA), under the call ERASMUS-EDU-2022-PI-FORWARD - Partnerships for innovation – Forward-looking projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: Artificial intelligence in education. The overall project budget is 999.810 € and the EU contribution is 799.848 €. The coordinator of the project is the Athena Research Center. The duration of the project is 36 months, from 1/1/2023 to 31/12/2025.

10. Who has approved this research on Ethics?

The research has been approved by the Ethics Committee of the Athena Research Center under the number 19-25/05/2023.

11. Who can I contact for more information about the study?

For more information about the research, please contact [contact person's name], member of the research team, Institute of Language and Language Processing/Athena Research Center, telephone [phone number], email [email address], address: [postal address].

12. Where can I submit complaints?

For any complaints regarding your participation, you can contact the Ethics Committee of the Athena Research Center at the address ethics-sec@athenarc.gr

For any complaint regarding the handling of your personal data, you may contact the Data Protection Officer of the Athena Research Center (dpo@athenarc.gr) and in any case the Personal Data Protection Authority (complaints@dpa.gr).

INFORMED CONSENT FORM FOR TEACHERS

Title:	**AI4EDU: Conversational AI assistant for teaching and learning**
Researchers:	**[Researcher Name],** ILSP/Athena R.C., [Role in the project]
Collaborating Bodies	Luleå Tekniska Universitet (Sweden), Ellinogermaniki Agogi (Greece), University of Cyprus (Cyprus), Cyprus Pedagogical Institute (Cyprus), Management Committee of Drumcondra Education Center (Ireland)
Funding authority:	European Commission, European Education and Culture Executive Agency (EACEA). Call: ERASMUS-EDU-2022-PI-FORWARD - Partnerships for Innovation - Forward Looking Projects, Lot 1: CROSS-SECTORAL PRIORITIES, Priority 1: AI in education.

Please reply below to indicate your consent.

I have read and understood the content of the Information Sheet	**YES**	**NO**
I was given enough time to decide if I wanted to participate in this research.	**YES**	**NO**
I have received satisfactory explanations regarding the handling of my personal data	**YES**	**NO**
I understand that my participation is voluntary and I can leave at any time without explanation and without any consequences.	**YES**	**NO**
I understand that if I leave the study my data will be destroyed.	**YES**	**NO**
I understand that I can request at any time that the information I have provided as part of the study be destroyed.	**YES**	**NO**
I know who I can contact if I would like more information about the study	**YES**	**NO**
I know who I can contact for complaints	**YES**	**NO**
I understand what my rights are under the General Data Protection Regulation and I know who I can contact to exercise my rights	**YES**	**NO**

I agree to use a conversational AI system in educational activities, that uses the ChatGPT Application Programming Interface (ChatGPT API) in accordance with OpenAI's terms of use (https://openai.com/policies/terms-of-use)	YES	NO
I agree that photographs of my participation in the study will be taken and used for the purpose of promoting and disseminating the results of the project	YES	NO
I agree that the fully anonymized data I will provide in the context of this study will be used in the future by the Athena Research Center for research and development purposes	YES	NO
I agree that the fully anonymised data I will provide in the context of this study will be made available in publicly available repositories, addressed to the research community, as part of the project results.	YES	NO

Participant Name:	
Postal address:	Phone/email:
Signature	**Date**
Name of investigator responsible:	
Signature	**Date**