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STEAME ACADEMY

TEACHING FACILITATION LEARNING & CREATIVITY PLAN (L&C PLAN) - LEVEL 2

SERVICE TEACHERS: Research – AI tools in education



1. Overview

Title	Research – AI tools in education		
Driving Question or Topic	The use of Artificial Intelligence tools in education, utility, efficiency improvement, risks, and limits.		
Ages, Grades, ...	AGES:13-18	7 th - 12 th grade	
Duration, Timeline,	22 LEARNING HOURS	11*90 MINUTES	4 ACTIVITIES
Activities			
Curriculum Alignment	Research Methodology, Statistics, Artificial Intelligence tools in education		
Contributors, Partners			
Abstract - Synopsis	Students participate in a real research process with application to exploring the possibilities of applying artificial intelligence tools to improve the efficiency of teachers and students. Basic topics and stages of the research process are taught, from the formulation of the research question and goal to the final presentation of results and conclusions.		
References, Acknowledgements			

2. STEAME ACADEMY Framework*

Teachers' Cooperation	<ul style="list-style-type: none"> • 1st Teacher (T1) - Teacher of Pedagogy, Philologist, or Sociologist Bibliography study, discussion on the benefits and risks of the spread of Artificial Intelligence and the limits that should be established for their use. Classroom. • 2nd Teacher (T2) - Teacher of Mathematics, Statistics, Research Methodology Teaching data collection methods, construction of appropriate questionnaires, sampling methods and techniques, methods of checking the validity of the questionnaire, coding of questions and answers, methods of statistical analysis and presentation of results. Classroom. • 3rd Teacher (T3) - Teacher of Mathematics, Statistics, Research Methodology or Computer Science Teaching the construction of electronic questionnaires (eg Google Forms) or data entry (in Excel Spreadsheet or other Database).
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	<p>Teaching statistical analysis methods and graphical presentation of results (using Excel and Analysis Tool Pak or another statistical analysis package eg SPSS, Jamovi).</p> <p>Teaching the creation of a suitable electronic presentation (PPT or INFOGRAPHICS or VIDEO or PPT with voice over) but also the writing an appropriate detailed report that describes all the stages of the research as well as the conclusions.</p> <p>Computer Lab.</p>
STEAME in Life (SiL) Organization	<p>The aim is to contribute to the development, by school administration, of a strategic planning to assist and facilitate the integration of ai activities to improve the skills of teachers and students.</p> <p>These conclusions can also be presented to specialists developing ai tools as ideas for promoting their creation and development.</p>
Action Plan Formulation	<p>STAGE I: Preparation by one or more teachers [STEPS 1-4], and</p> <p>STAGE II: Action Plan Formulation [Preparation STEPS 1-3]...</p> <p>Refers to the creation of this Learning Plan, by teachers in collaboration</p> <p>.</p> <p>STAGE II: Action Plan Formulation [Development STEPS 4-11]...</p> <p>Refers to the realization by the students of the four activities of the Learning Plan.</p> <p>The support, feedback and evaluation by the teachers is accompanying throughout the implementation of the activities and not only the final result.</p>

* under development the final elements of the framework

3. Objectives and Methodologies

Learning Goals and Objectives	<p>By the end of the L&C Plan, students should be able to know and complete the following:</p> <ul style="list-style-type: none"> • The importance and potential of artificial intelligence in our daily lives and in improving our efficiency. • Ethical issues and limits to the use of AI • Data Collection Methods and Sampling Methods and Techniques • Construction and use of appropriate questionnaires (printed or electronic) • Questionnaire validity and reliability control methods (use of appropriate software) • Methods of statistical analysis and presentation of results (use of appropriate software) • Presentation of results - Writing a detailed research report • <i>Recommendations for strategic planning for smooth and efficient integration of artificial intelligence activities in their school unit</i>
Learning Outcomes and expected Results	<p>Upon completion of this research activity, students will be able to follow the stages of a research process, set research goals and objectives, explore the potential of artificial intelligence as well as ethical issues and limits to its use, construct questionnaires, collect answers, analyze them and present the results and conclusions of their research. These skills are very important in the 21st century.</p>
Prior Knowledge and Prerequisites	<p>Basic knowledge of descriptive statistics and use of spreadsheets (excel).</p>

<p>Motivation, Methodology, Strategies, Scaffolds</p>	<p>The learning process is based on the participation of students and their teachers in a process of exploring the potential of artificial intelligence and its potential to facilitate the educational process and improve the efficiency of teachers and students, as well as various ethical issues and other problems that may arise with the use of such tools.</p> <p>The result will be conclusions on the readiness and availability of students and teachers for the use of such tools, as well as formulation of recommendations in the context of the strategy for the smooth introduction of activities using artificial intelligence in the educational process. The importance of results is itself a great motivator. On the other hand, the skills acquired during research are also very important for the citizens of the 21st century. These skills are acquired through exploring the potential of artificial intelligence, but also teamwork for the construction of questionnaires (printed and electronic), data collection and entry, data analysis, presentation of results and drawing conclusions.</p> <p>Throughout this process there is continuous discreet support from teachers and evaluation, feedback on deliverables at each stage.</p>
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4. Preparation and Means

<p>Preparation, Space Setting, <i>Troubleshooting Tips</i></p> <p>Resources, Tools, Material, Attachments, Equipment</p>	<p>The theoretical framework will be taught in the classroom. However, the students will process the questionnaires (printed or electronic), the data entry, the statistical analysis and the preparation of the presentation of the results in the computer laboratory (with the support of the teachers).</p> <ul style="list-style-type: none"> ● Ethics and potentials of AI tools in education <ul style="list-style-type: none"> ○ [EN] A Generative AI Primer (UK National Centre for AI) ○ [EN] Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings ○ [EN] Future Tools: Listing of Over 2000 AI Tools ○ [EN] Our AI Code of Ethics (Code.org) ○ [EN] ENAI Recommendations on the Ethical Use of Artificial Intelligence in Education ○ [EN] video "Ethics & AI: Equal Access and Algorithmic Bias." ○ [EN] video "ARTIFICIAL INTELLIGENCE: Training Data and Bias" ● Data Collection Methods and Sampling Methods and Techniques <ul style="list-style-type: none"> ○ [GR] ΜΕΘΟΔΟΙ ΚΑΙ ΤΕΧΝΙΚΕΣ ΔΕΙΓΜΑΤΟΛΗΨΙΑΣ.pdf - TEIION e ... ○ [GR] ENOTHTA 04. Δειγματοληψία ○ [EN] sampling ppt - SlideShare ○ [EN] Sampling techniques - SlideShare ○ [EN] Sampling Design, Questionnaire Design & Data ib - SlideShare ● Construction and use of appropriate questionnaires (printed or electronic) <ul style="list-style-type: none"> ○ [GR] ENOTHTA 02. Σχεδιασμός ερωτηματολογίου ○ [GR] ENOTHTA 03. Εμφάνιση και προέλεγχος ερωτηματολογίου ○ [EN] questionnaire design in research - SlideShare ○ [EN] Questionnaire and its Types - SlideShare ○ [EN] Top 21 Best Online Survey Software and Questionnaire Tools ... ○ [EN] How to Create a Free Online Survey with Google Docs ...
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- Questionnaire validity and reliability control methods (use of appropriate software)
 - [\[EN\] Reliability test: Compute Cronbach's alpha using SPSS ...](#)
 - [\[EN\] Reliability test: Interpret Cronbach's alpha output in](#)
 - [\[EN\] Calculating Cronbach's Alpha in Microsoft Excel Compared to ...](#)
 - [Reliability analysis — jamovi](#)
(JAMOMI is a free statistical analysis software)

- Methods of statistical analysis and presentation of results (use of appropriate software)
 - [\[EN\] How to Use SPSS for Beginners - Online Statistics](#)
 - [\[EN\] SPSS Tutorial \(for Beginners\): Learn Online in Simple Steps ...](#)
 - [\[EN\] Use the Analysis ToolPak to perform complex data analysis ...](#)
 - [\[EN\] learning statistics with jamovi](#)
(free textbook that covers the contents of an introductory statistics class using JAMOMI, a free statistical analysis software)
 - [\[EN\] Jamovi video tutorials](#)

- Presentation of results - Writing a detailed research report
 - [\[EN\] 5 Ways to Effectively Present Survey Data - Survey Anyplace](#)
 - [\[EN\] Presenting survey results – Report writing - Queensland ...](#)
 - [\[EN\] AN ASSESSMENT OF THE EFFECTIVENESS OF LIBRARY \(report\)...](#)
 - [\[EN\] An Assessment Of The Effectiveness Of Library Resources \(ppt\)...](#)
 - [\[GR\] «Αξιολόγηση Υπηρεσιών της Βιβλιοθήκης και Κέντρου ...](#)
 - [\[GR\] Υπόδειγμα γραπτής παρουσίασης έρευνας \(pdf\)](#)

Health and Safety

5. Implementation

Instructional Activities,
Procedures, Reflections

The plan can be implemented in 22 learning hours. The first 4 are theoretical but may include familiarity with some AI tools and a meeting with representatives of students, teachers, and administration to first explore their attitudes towards AI. The rest include a theoretical framework in parallel with practical application, work monitoring, feedback, evaluation.

1. Ethics and potentials of AI tools in education

(4 learning hours)

T1 discusses with students the significant impact of AI tools on education.

These tools pose significant challenges in terms of assessment and academic integrity, but they also present opportunities, for example by saving teaching staff time by helping to create learning materials or by providing students with new tools to improve the way they work and be more efficient.

The applications of artificial intelligence are now noticeably present in our daily lives beyond school activity and teachers and students must adapt and be ready to use such tools in a world that is changing around us rapidly. The discussion should also include how ready teachers and students are to use such tools in the educational process and how to ensure proper development of teacher and student skills, and the integrity of assessment.

All this discussion should be used at a later stage in the formulation of a questionnaire to students, teachers and school management that explores their views and attitudes on all these issues.

This activity may include getting familiar with some AI tools and a meeting with representatives of students, teachers, and administration to first explore their attitudes towards AI.

2. Data Collection Methods and Sampling Methods and Techniques (2 learning hours)

T2 teaches the methodology of a research process, as well as the various data collection methods and sampling techniques. Students under the guidance of their teacher are asked to choose the appropriate methodology for their own research.

Teaching methods of data collection, construction of appropriate questionnaires, methods - sampling techniques, methods of checking the validity of the questionnaire, coding of questions and answers, methods of statistical analysis and presentation of results.

3. Construction and use of appropriate questionnaires (printed or electronic)

Questionnaire validity and reliability control methods (use of appropriate software)

Methods of statistical analysis and presentation of results (use of appropriate software)

(8 learning hours)

T1, T2 and T3 in collaboration teach students how to construct appropriate printed or electronic questionnaires. They also teach ways to encode questions and answers, and to enter data or prepare the database for processing.

The theoretical framework as well as the use of appropriate software for checking the validity and reliability of the questionnaire, as well as basic methods of statistical analysis of questionnaires are also taught.

After completing the theoretical framework, the students are divided into groups.

The 1st group deals with the construction of the questionnaire with appropriate questions, the 2nd group is trained in the conversion of the questionnaire in electronic form or in the coding and data input and the 3rd group is trained in data analysis methods using

appropriate software. The groups interact with each other both in the initial stages and afterwards.

After the questionnaire is constructed in its first version (printed or electronic) it is given for testing to a small group of people.

The questionnaire is checked if it is legible, with simple and understandable questions, if bias is avoided from the wording of the questions, if the questions measure what we want, etc. Then the appropriate interventions are made for the final form of the questionnaire that will be available for the main survey.

From the first, small-scale sharing of the questionnaire, some initial conclusions or some points may emerge that may need more detailed investigation and may need to be included in the final form of the questionnaire.

It may be that at some points clarifying open-ended questions need to be added (eg Indicate what skills you want to develop using AI tools at school.)

At this stage, all three groups of students we mentioned work together. The final questionnaire is then shared to the sample selected for the main survey.

4. Presentation of results - Writing a detailed research report (8 learning hours)

Until the questionnaires and the data collection is completed, T3 teaches students methods for effectively presenting the results and writing a research report.

When the answers of the questionnaire are collected (all students participate in this process), the first preliminary analysis of the answers is done with simple descriptive statistics. In the first presentation of the results, we have preliminary conclusions and further research issues are discussed and formulated for a more detailed analysis of the questions, in topics that may be of interest, e.g.

- Checking the differentiation of the answers according to various demographic data (eg Age, Gender, Area, Educational Level, etc.)
- Correlations or groupings of the questions
- Reliability Test

Detailed Statistical Analysis is performed, and appropriate graphics are used for better presentation of the conclusions.

The presentation of the results as well as the writing of the research report is being prepared.

At this point students can work again in groups both to investigate with statistical methods the various questions, but also to prepare the individual stages of the presentation or research report.

Alternatively, students can work in groups and each group can prepare different presentations and reports.

Assessment - Evaluation

T1, T2 and T3 provide ongoing support, feedback, and evaluation.

The feedback and evaluation is continuous, from the point of construction of the appropriate questionnaire and throughout the process of conducting the research, the analysis and the presentation of the results.

Presentation - Reporting - Sharing

The presentation of the results and suggestions for the smooth integration of activities using artificial intelligence in the educational process, as well as proposals for the preparation of teachers and students that will be drawn as conclusions from the research, will take place in front of representatives of students, teachers, and school administration. The aim is to contribute to

*Extensions - Other
Information*

the development of a strategic planning to assist and facilitate the integration of such activities to improve the skills of teachers and students. Both the presentation and the research report can be published on the school website.

During the discussion and through the research that will follow, for the skills, teachers and students would like to develop, as well as the possibilities of improving school administration processes with the use of artificial intelligence tools, it is very likely that specific needs will arise for the development of a specific tools that is not yet available. These conclusions can therefore be presented to specialists developing such tools as ideas for promoting their creation and development. Interested students can continue to contribute in this direction and after the end of the research.

Resources for the development of the STEAME ACADEMY Learning and Creativity Plan Template

In the case of learning through project-based activity

STEAME ACADEMY Prototype/Guide for Learning & Creativity Approach Action Plan Formulation

Major steps in the STEAME learning approach:

STAGE I: Preparation by one or more teachers

1. Formulating initial thoughts on the thematic sectors/areas to be covered
2. Engaging the world of the wider environment / work / business / parents / society / environment/ ethics
3. Target Age Group of Students - Associating with the Official Curriculum - Setting Goals and Objectives
4. Organization of the tasks of the parties involved - Designation of Coordinator - Workplaces etc.

STAGE II: Action Plan Formulation (Steps 1-18)

Preparation (by teachers)

1. Relation to the Real World – Reflection
2. Incentive – Motivation
3. Formulation of a problem (possibly in stages or phases) resulting from the above

Development (by students) – Guidance & Evaluation (in 9-11, by teachers)

4. Background Creation - Search / Gather Information
5. Simplify the issue - Configure the problem with a limited number of requirements
6. Case Making - Designing - identifying materials for building / development / creation
7. Construction - Workflow - Implementation of projects
8. Observation-Experimentation - Initial Conclusions
9. Documentation - Searching Thematic Areas (AI fields) related to the subject under study – Explanation based on Existing Theories and / or Empirical Results
10. Gathering of results / information based on points 7, 8, 9
11. First group presentation by students

Configuration & Results (by students) – Guidance & Evaluation (by teachers)

12. Configure STEAME models to describe / represent / illustrate the results
13. Studying the results in 9 and drawing conclusions, using 12
14. Applications in Everyday Life - Suggestions for Developing 9 (Entrepreneurship - SIL Days)

Review (by teachers)

15. Review the problem and review it under more demanding conditions

Project Completion (by students) – Guidance & Evaluation (by teachers)

16. Repeat steps 5 through 11 with additional or new requirements as formulated in 15
17. Investigation - Case Studies - Expansion - New Theories - Testing New Conclusions

STAGE III: STEAME ACADEMY Actions and Cooperation in Creative Projects for school students

Title of Project: _____

Brief Description/Outline of Organizational Arrangements / Responsibilities for Action

STAGE	Activities/Steps Teacher 1(T1) Cooperation with T2 and student guidance	Activities /Steps By Students Age Group: ____	Activities /Steps Teacher 2 (T2) Cooperation with T1 and student guidance
A	Preparation of steps 1,2,3		Cooperation in step 3
B	Guidance in step 9	4,5,6,7,8,9,10	Support guidance in step 9
C	Creative Evaluation	11	Creative Evaluation
D	Guidance	12	Guidance
E	Guidance	13 (9+12)	Guidance
F	Organization (SIL) STEAME in Life	14 Meeting with Business representatives	Organization (SIL) STEAME in Life
G	Preparation of step 15		Cooperation in step 15
H	Guidance	16 (repetition 5-11)	Support Guidance
I	Guidance	17	Support Guidance
K	Creative Evaluation	18	Creative Evaluation