

MEANINGFUL LEARNING THROUGH INTERDISCIPLINARY EDUCATION

JULY 2022



Project no. 2020-1-PT01-KA101-078066

THE PROJECT

A project aimed at preparing teachers with knowledge and methodologies to work in an interdisciplinary way.

PREPARATION

Several activities preceded the mobility flow: dissemination of the project, selection of candidates and their preparation in the framework of the project, preparation of a glossary, among others.

10 TEACHERS IN MERSIN: THE COURSE

Ten teachers from the *Agrupamento de Escolas da Lixa* flew to Mersin to take part in a structured course under the topic of interdisciplinary education.

CULTURAL ACTIVITIES

The group also participated in several cultural activities that allowed them a better understanding of the Turkish culture.

BACK HOME: SHARING KNOWLEDGE

After an intense week, full of learning activities and cultural experiences, the group returned home with a lot to share with their peers, new methodologies and lots of ideas to work with their students.

THE OUTCOME

More effective teaching approaches, more cooperation between different disciplines, more motivated teachers and students.



THE PROJECT

The world is interdisciplinary and teaching and learning should be too, to truly prepare the student for full integration into society.

Today's world is increasingly demanding and challenging. It is important to provide our students with learning situations that enable them to acquire the skills necessary for true integration into society and the labour market. They acquire a lot of theoretical knowledge, but the transfer of what is learned in school to life outside school is low and not always the most effective. Moreover, this theoretical information is processed within a certain subject area. It is necessary to know how to interconnect that information, so that students are able to make global use of the knowledge acquired, creating the necessary conditions for them to develop essential skills, such as critical and reflective thinking, collaborative work, communication skills, autonomy, perseverance in problem solving...

Teachers' mission is to prepare citizens for a complete integration in the world around them, able to deal with change and uncertainty; to equip students with skills that will increase their employability; and above all, to create the conditions to develop in each student the will, the ability and the knowledge that will enable them to learn throughout their lives. For that, it is necessary to create a learning environment that allows the development of these new competences of the student of the 21st century.

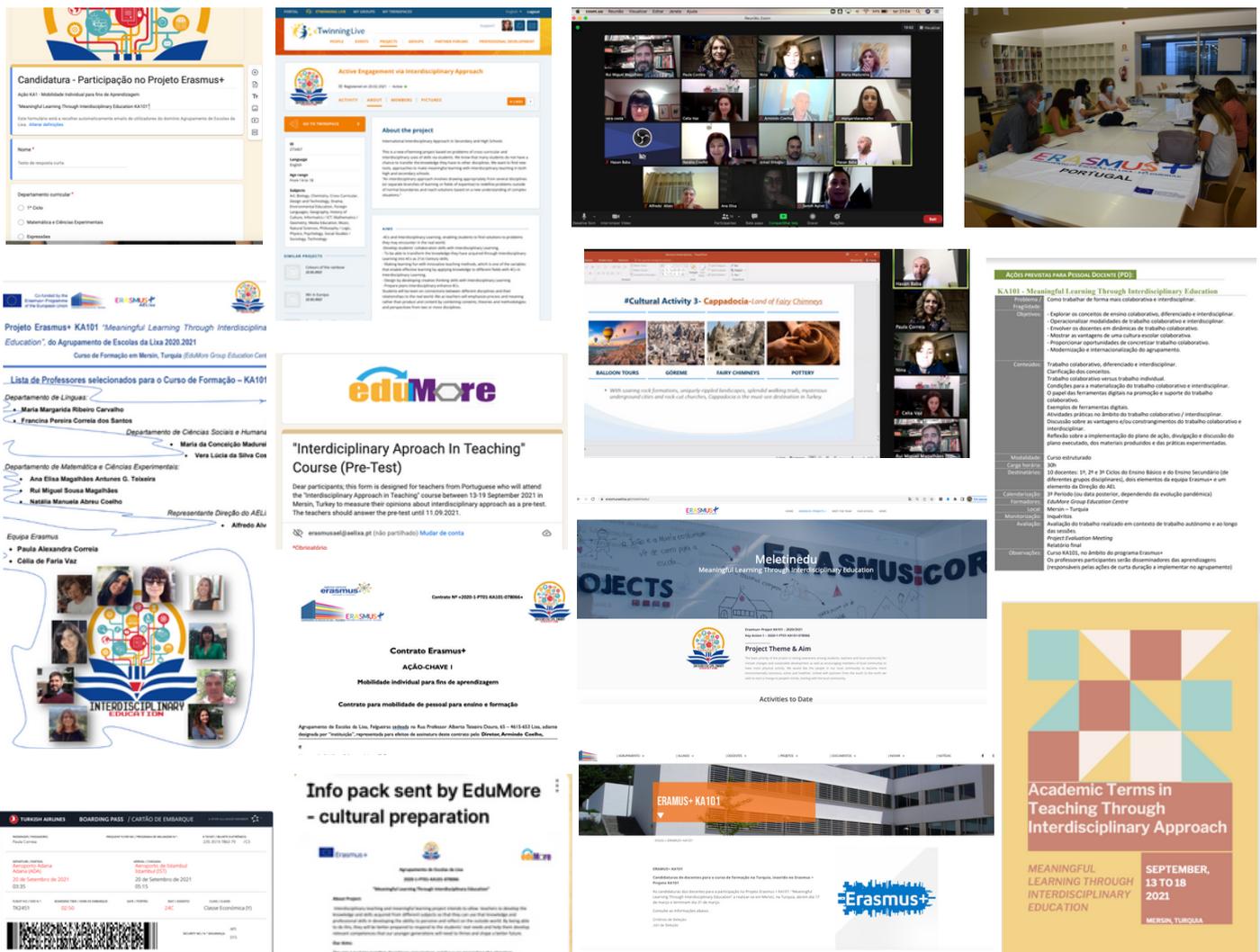
With the implementation of this project, and with the objective of contributing to the development of this 21st century student, we intended to provide our teachers with the acquisition and development of competencies and tools on interdisciplinary education that will allow them to implement collaborative work, around a common project, developed by teachers from different subject areas, bringing together different perspectives towards the same objective.

 Erasmus+	Call 2020, Round 1, KA1 - Learning Mobility of Individuals KA101 - School education staff mobility Form ID: KA101-SAF71973 Deadline (Brussels Time) 2020-02-11 12:00:00
Context	
Project Title	Meaningful Learning Through Interdisciplinary Education
Project Acronym	meletinedu

Project no. 2020-1-PT01-KA101-078066

PREPARATION

Before the flow of the 10 mobilities, several dissemination and preparation activities were developed: constitution of a work team; dissemination of the project to the school community; online meetings with the Turkish training centre - EduMore; inclusion of the structured course in the Training Plan of Agrupamento de Escolas da Lixa; creation of an eTwinning project; creation of a website; creation of the project logo; elaboration and dissemination of the teachers' selection criteria; constitution of a selection jury; selection of the 10 teachers and presentation to the community; meetings with the selected teachers; pedagogical and cultural preparation of the participating teachers; preparation and signing of the contracts with the selected teachers; creation of a WhatsApp group with the teachers; purchase of airline tickets and travel insurance for the flow to Mersin and booking of hotels; preparation on the topic to help with language preparation; application of a questionnaire to gauge the candidates' expectations and knowledge of the structured course; among other preparatory activities.



10 TEACHERS IN MERSIN

THE COURSE & CULTURAL ACTIVITIES

New experiences, new knowledge, new teaching tools...



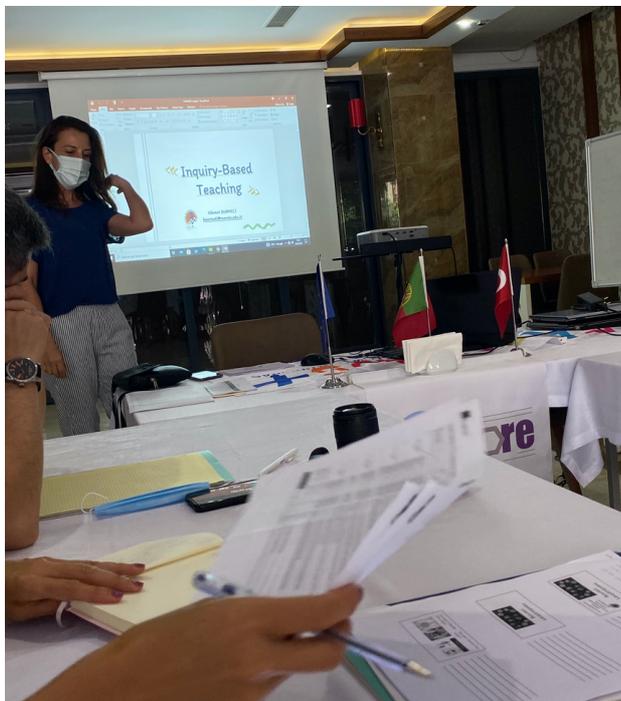
Ten teachers from the Agrupamento de Escolas da Lixa, Felgueiras, participated in a training course between September 13 and 18, in Mersin, Turkey, under the Erasmus+ KA101 *Meaningful Learning Through Interdisciplinary Education* project, co-funded by the European Union.

The course, taught by the EduMore Group Education Centre, aimed to present and discuss teaching-learning methods and strategies that promote the development of interdisciplinary work, through the application of the 5E educational model.

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DAY 1

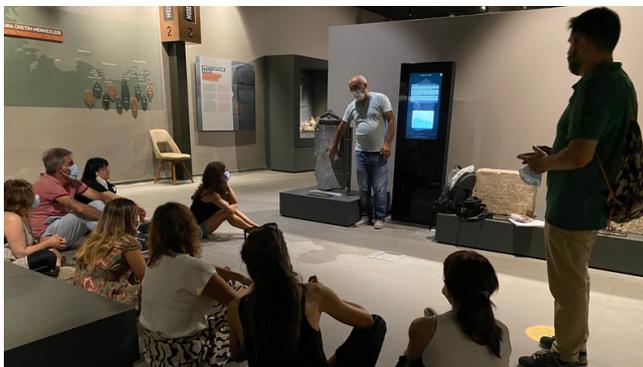
The first day of the course started with a welcoming reception by the representatives of EduMore and some ice-breaking activities. Then it was time to focus on the course topics. Professor Gülsüm Gök began with an explanation of interdisciplinary teaching and some investigating examples. This was followed by a discussion about the goals and limitations of interdisciplinary learning and the participants also had the opportunity to share some educational experiences.



DAY 2

On day 2 the participants were introduced to the 5E instructional model, its five phases and purposes and discussed the teachers' and students' roles in the 5E teaching model. After having been given tips for designing a lesson plan using this model, it was time for the participants to apply the new acquired knowledge, by preparing and presenting lesson plans according to the 5E learning model, taking into account the interdisciplinary approach and differentiated teaching. This was followed by a class discussion and evaluation of the lesson plans.

The activities continued at the Mersin Museum.



Sample Lesson Plan Explore

Explore	Your Task
Objectives Students will be able to <ul style="list-style-type: none"> • demonstrate how to modify a peek box to see an object • describe how objects reflect light into our eyes allowing the objects to be seen • draw a ray diagram to demonstrate that light travels in straight lines • describe how a shadow is formed by blocking light. 	Provide students with hands-on, shared experiences of how light enables us to see objects. Activities <ul style="list-style-type: none"> • Shining light • The travelling light Show



Application of the 5E Instructional Model
Subject/grade level: Environment /12th
Lesson objective: Build a vegetable garden

Mrs. Hikmet SÜRMELE

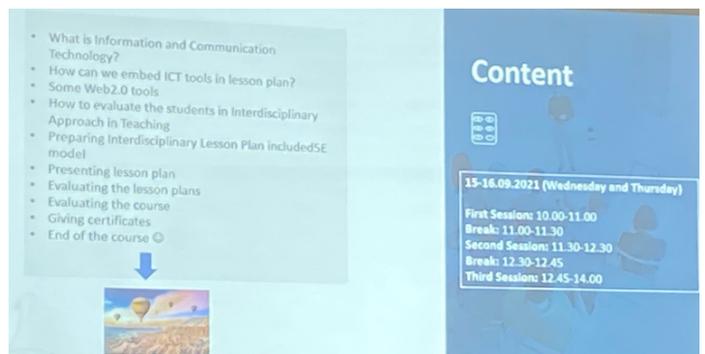
14/09/2021

ENGAGEMENT	TASKS
Students should be able to: <ul style="list-style-type: none"> - be aware of word problems - notice daily behaviours 	<ul style="list-style-type: none"> - Watch a video clip - Identify Key words
EXPLORATION	TASKS
<ul style="list-style-type: none"> - Identify different types of soil - Identify the environmental conditions - Identify the type of vegetables suitable for our soil 	<ul style="list-style-type: none"> - Research on different types of soils, plants - Getting information about atmospheric condition (our weather station) - Lab experience
EXPLANATION	TASKS
<ul style="list-style-type: none"> - Students present their findings - Students prepare a presentation - Students reflect upon the teacher's explanation 	<ul style="list-style-type: none"> - Students oral presentation (discussion, video, powerpoint)
ELABORATION	TASKS
<ul style="list-style-type: none"> - Plan the distribution of the plants according to previous research 	<ul style="list-style-type: none"> - Build the vegetable garden - Weekly recording of the plants growth
EVALUATION	TASKS
<ul style="list-style-type: none"> - Recognise the importance of individual contributions 	<ul style="list-style-type: none"> - Report on the plant growth process and presentation of results

DAY 3

On the third day Professor Semih Asiret spoke about the use of ICT tools in education, the advantages of ICT tools in interdisciplinary and differentiated education. The group also discussed meaningful learning and activities, innovative approaches and ICT tools that accomplish meaningful learning. After that, it was time to prepare interdisciplinary and differentiated lesson plans and activities according to the 5E learning model (group work).

After these activities, the group visited Tarsus, a nearby town. They had a cultural afternoon that included a visit to St Paul's Well, Prophet Daniel's Tomb, and the local museum.



DAY 4

On the fourth day the Portuguese teachers continued the group work activities that had started the day before. In the end, they evaluated and discussed the lesson plans and activities prepared by the groups.



Some sample plans from the course:

Interdisciplinary lesson plan		
Grade level	7 th	
Lesson 1 Natural Sciences	Content Domain	The Earth in Transformation
	Content Subdomain	The Earth tells its story - fossilization
	Learning Objectives:	Explain the contribution of the study of fossils and fossilization processes to the reconstruction of the history of life on Earth; Distinguish historical time from geological time in diversified documents, valuing knowledge from other disciplines; Observation of fossil samples.
Lesson 2 Math	Content Domain	Algebra
	Content Subdomain	Regularities and sequences
	Learning Objectives:	Recognize regularities in sequences or successions of rational numbers and determine a law of formation; Determine terms of a known sequence to its formation law; Compare, interpret and establish connections between multiple representations of a sequence.
Lesson 3 Physics and chemistry	Content Domain	Materials
	Content Subdomain	Chemical transformations
	Learning Objectives:	To distinguish, experimentally and from selected information, reactants and products of the reaction; To designate a chemical transformation by a chemical reaction. Represent chemical transformations by "equations" of words. Read the "equations" of words.
Materials:	Video; reagents (acid), fossils, laboratory material, mobile phone	
Precautions / safety:	Laboratory rules; field exit rules.	
Previous knowledge/preliminary		
<ul style="list-style-type: none"> Nature has an order of creation/formation Laboratory rules and material handling Properties of numbers and algebraic expressions 		
SE steps		
ENGAGE	In the first phase of the lesson it is intended to capture the attention of the students through the visualization of the video https://www.youtube.com/watch?v=ArYJTFHFQ0 and subsequent discussion. (the mentimeter can be used) (TABLE -KWL (Know, Wonder, Learned))	
EXPLORE	Study visit to collect images of formation patterns in nature (eg plants) for later identification. In class, fossil observation and identification of the spiral/pattern and Fibonacci. Using Kahoot present lists of numbers to identify sequences Ask students to build sequences of numbers by applying some pattern Research the chemical constituents of shell fossils Propose a group investigation to carry out the chemical reaction between the shell and the acids.	

INTERDISCIPLINARY LESSON PLAN		
Grade level	7	
Portuguese	Content domain	Health
	Content subdomain	Eating habits
	Learning objectives	Students will be able to talk about their eating habits
Spanish	Content domain	Health
	Content subdomain	Healthy vs unhealthy eating
	Learning objectives	Students will be able to know / identify what is healthy and unhealthy food
English	Content domain	Health
	Content subdomain	Healthy and unhealthy food
	Learning objectives	Students will be able to make a list of healthy and unhealthy food
Biology	Content domain	Health
	Content subdomain	Healthy eating (canteen menu)
	Learning objectives	Students will be able to plan a weekly canteen menu
Materials	Computer, mobile phone...	
Precautions	The teacher needs to orient/guide the students' research so that they don't get lost.	
Preliminary		
Misconceptions of students on what healthy and unhealthy eating is.		
SE Steps		
ENGAGE	- Kahoot: getting to know the students' eating habits (no assessment / no judgement) - Exploring / discussing pictures about obesity	
EXPLORE	- In groups students research online (oriented research – YouTube, google search...) about healthy and unhealthy eating habits. - Class discussion on the conclusions (mentimeter).	
EXPLAIN	- After checking / discussing the students' conclusions (using mentimeter + class discussion), the students are given the scientific explanation by the teacher about healthy and unhealthy eating.	
ELABORATE	- In groups, students are asked to plan a weekly menu for the school canteen and include the number of calories (in Portuguese, Spanish and English).	
EVALUATE	- With the students' presentations, the teacher checks their acquired knowledge on each subject, using rubrics.	

DAY 4 (CONT.)

LESSON PLAN TEMPLATE

Grade: 10th (HUMAN RIGHTS)

LESSON 1 HISTORY

CONTENT DOMAIN	SECOND WORLD WAR
CONTENT SUBDOMAIN	Human rights / Holocaust
LEARNING OBJECTIVES	<ul style="list-style-type: none"> Students will be able to recognise the war period. Students will be able to link human rights disrespect and Nazism

LESSON 2 PHILOSOPHY

CONTENT DOMAIN	ETHIC FUNDAMENTATION
CONTENT SUBDOMAIN	Ethical theories (Utilitarian and deontological)
LEARNING OBJECTIVES	<ul style="list-style-type: none"> Students will be able to distinguish different ethics. Students will be able to defend one of the ethics Students will be able to identify ethical theories in videos.

LESSON 3 ENGLISH

CONTENT DOMAIN	THE WORLD AROUND US
CONTENT SUBDOMAIN	Solutions - famous people - world problems
LEARNING OBJECTIVES	<ul style="list-style-type: none"> Students will be able to improve their vocabulary. Students will be able to speak about human rights activists worldwide.

MATERIAL	Computers, board, mobile phones
PRECAUTIONS	Verify classroom link to net / wifi
PRELIMINARY	<ul style="list-style-type: none"> Students are able to collect data related to the Second World War, Nazism and Holocaust Students are able to research information on the studied subject. Students should be able to discuss and argue facts, videos and historical events.

5E STEPS

ENGAGE	<p>Viewing activity – short video (1st part) – “The story of human right” – English version from Youtube.</p> <p>Questions concerning the topic mentioned in the video.</p> <p>Students discuss the theme / Teacher asks questions (elicit information)</p>
EXPLORE	<p>Students are divided in small groups so that they can find a concept and write it on Mentimeter in order to share with all colleagues.</p>
EXPLAIN	<p>Students watch the rest of the video and take notes on the information given (definition, types of human rights, events in the past, ethics, activists)</p>
ELABORATE	<p>Students are expected to build an infographic (Canva) to be posted in a Padlet. The infographic should depict a good and a bad example related to human rights / a world activist / landmark (oral presentation)</p>
EVALUATE	<p>Formative assessment – play a Kahoot game</p> <p>Rubrics – Classroom (Google)</p>

EVALUATION SCALE (TEACHER)

	A EXCELLENT	B GOOD	C SATISFACTORY	D NEEDS IMPROVEMENT
1. KNOWLEDGE The student acquired the right concepts	Complete knowledge on the studied concepts	Complete on some concepts	Not complete Some concepts are not well acquired	Not complete Some inaccuracies
2. COMMUNICATION The student communicated effectively				
3. CREATIVITY The student presented the ideas using critical thinking and creativity.				
4. AUTONOMY The student was autonomous and accomplished all criteria				
5. CITIZENSHIP The student was collaborative and was able to interact with his/her peers.				
6. SELF-EVALUATION The student was able to do self / peer assessment (concerning engagement)				

DAY 5

On the fifth day the group was taken on a cultural visit to Cappadocia, a beautiful region in central Turkey famous for its fairytale scenery, cave dwellings, remarkable rock formations and, of course, the hundreds of hot air balloons that soar in the sky during sunrise each morning.



TIME TO SAY GOODBYE...

Time to say goodbye to an amazing and rich week, plenty of learning experiences and cultural knowledge. The group of teachers returned home with so much to share with their peers and also with their students.

Hasan Baba, the Professors, his collaborators and the training centre were very welcoming and professional and the course and the cultural activities were carefully planned.

Yakında görüşürüz, Türkiye!





BACK HOME SHARING KNOWLEDGE

On the return to their school, the teachers shared their knowledge with their peers, from their school and neighbouring schools.



The participating teachers sharing knowledge with their peers

WHY TEACH WITH AN INTERDISCIPLINARY APPROACH?



Interdisciplinary Teaching Increases Student Learning

Engaging students and helping them to develop knowledge, insights, problem solving skills, self-confidence, self-efficacy, and a passion for learning are common goals that educators bring to the classroom, and interdisciplinary instruction and exploration promotes realization of these objectives.

It also promotes significant learning, which place when meaningful and lasting classroom experiences occur. When teachers impart students with a range of skills, and insights about the educational process that students will see as meaningful and salient to them, they promote student engagement in the learning process and greater learning occurs.

The gain - Interdisciplinary instruction fosters the acquisition of foundational knowledge, promotes integration of ideas from multiple disciplines and provides insight on how to apply knowledge all of which advance a students understanding of how to learn. Moreover, students are encouraged to account for the contribution of disciplines that highlight the roles of caring and social interaction when analyzing problems. Thus, the very structure of interdisciplinary learning is consistent with the core features of significant learning, so students are expected to find interdisciplinary education engaging and thus an effective way to advance their understanding of topics under investigation.



The World is Interdisciplinary

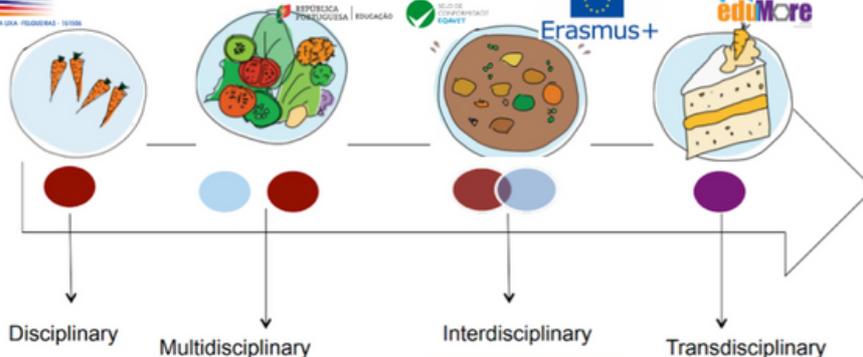
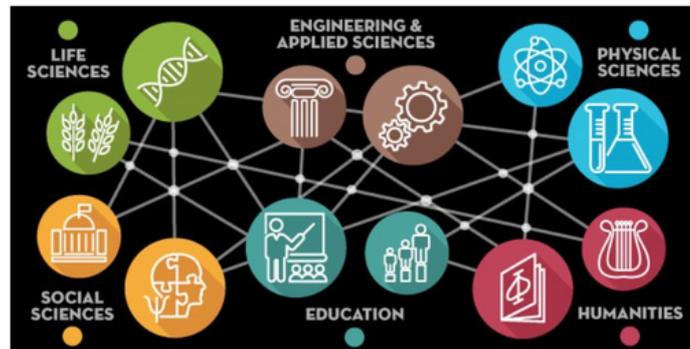
According to The National Council for Teachers of English (NCTE 1995) "educational experiences are more authentic and of greater value to students when the curricula reflects real life, which is multi-faceted rather than being compartmentalized into neat subject-matter packages." Real-world problems are complex, so no single discipline can adequately describe and resolve these issues. Therefore, it is not surprising that interdisciplinary forms of teaching and learning are prevalent and growing.

THE 5E PEDAGOGICAL MODEL

favours the interdisciplinary dimension of learning, placing the student at the centre of the teaching and learning process, the major objective of the current educational paradigm.



Interdisciplinary Learning



working with only one discipline

working with multiple disciplines, maintaining boundaries
people from different disciplines working together

working between more than one discipline, blurring boundaries using a real synthesis of approaches

working across and beyond disciplines, eliminating boundaries big and real life problems school of thought beyond the disciplinary perspectives

Learning Skills



critical thinking creativity collaboration communication

Literacy Skills



information media technology

Life Skills



flexibility leadership initiative productivity social skills

Better
problem
solvers

Cognitive
skills

Life Long
Learners

Communication
skills

More
Creative

Argumentation
skills



THE CITIZENS WE WANT

STREAM EDUCATION



Science | Technology | Reading | Engineering | Arts | Mathematics

the nature universe, where everything comes from

tools & innovative devices, uses & enhanced abilities

communicate confidently and express own needs, ideas and feelings

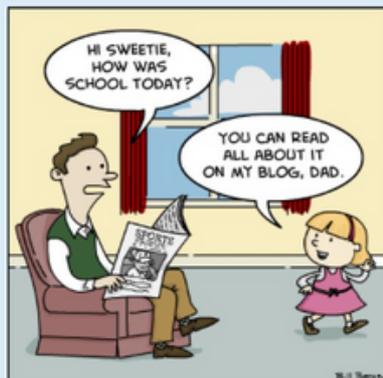
purposeful innovation, creation & analysis

humanities, ethics, ideals & expression

fact organizing base language

https://www.pngfind.com/mpng/mwbTwR_what-is-stream-science-technology-reading-engineering-art/

USE OF ICT IN EDUCATION



- 21. century skills - information and technology
- One way communication for interaction
- Digital Natives,
- Digital Immigrants
- Digital Wisdom
- Active Learners-Active Pause
- Increases motivation; interaction
- Students' interest in learning grows
- Collaboration between students
- Enhancing creativity
- Personalization and content up-to-date
- Decrease the amount of direct instruction
- Students are be able to handle information

5 E MODEL + ITC



• WEB 2.0 TOOLS

1-ENGAGE

What tools can I use?

- Padlet
- Google Classroom
- Mentimeter

What does it look like?

- **Brainstorm**
 - What do you think?
 - Why did this happen?
- **Ask questions**
 - -What do you wonder?
 - - What are you curious about?
 - - How can this problem be solved?
- **Access prior knowledge?**
 - -What do you know?
 - How did you learn it?

2- EXPLORE

What tools can I use?

- Google Search
- Youtube
- Google Classroom Question
- Microsoft Excel, PowerPoint

What does it look like?

- Watch videos
- Research
- Read articles
- Discuss
- Investigating
- Data collection
- Teacher
 - is facilitator
 - guides students
 - begin constructing models or initial explanations.
 - Encourages student-to-student interaction
 - Observes and listens to the students

3- EXPLAIN

What tools can I use?

- Zoom
- Flipgrid
- Edpuzzle
- Padlet

What does it look like?

- Live Synchronous Sessions
- Video Lessons
- Instruction
- Modeling
- Scaffolding

3- EXPLAIN

What tools can I use?

- Zoom
- Flipgrid
- Edpuzzle
- Padlet

Teaching Strategies

- Encourages students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and information through mini-lecture, text, internet, or other resources
- Builds on student explanations
- Provides time for students to compare their ideas with others and if desired revise their ideas

4- ELABORATE

What tools can I use?

- Scratch,
- Storyjumper,
- Canva
- Microsoft Office Tools
- Quizlet
- FlipGrid
- Kahoot
- Quizizz

What does it look like?

- Introduce New problem situations
- Applies new labels, definitions, explanations, and skills in new, but similar, situations
- Uses previous information to ask questions, propose solutions, make decisions, design experiments, or complete a challenge
- Draws reasonable conclusions from evidence
- Critiques the models, explanations, or arguments made by others using evidence and reasoning
- Makes conceptual connections between new and previous experiences
- Communicates understanding to others

4- ELABORATE

What tools can I use?

- Scratch,
- Storyjumper,
- Canva
- Microsoft Office Tools
- Quizlet
- FlipGrid
- Kahoot
- Quizizz

Teaching Strategies

- Expects students to use vocabulary, definitions, and explanations provided previously in new contexts
- Encourages students to apply the concepts and skills in new situations
- Provides additional evidence, explanations, or reasoning
- Reinforces students' use of scientific terms and descriptions previously introduced
- Asks questions that help students draw reasonable conclusions from evidence and data

5- EVALUATE

What tools can I use?

- Google Classroom,
- Kahoot,
- Socrative,
- Mentimeter,
- Learning Apps,
- Quizizz,
- Padlet,
- Plickers

What does it look like?

- Mostly formative assessment
- Portfolio, rubrik, self-assessment, checklist
- Get report for first four phase
- Gives feedback to students
- Assesses progress by comparing current understanding with prior knowledge
- Asks additional questions that go deeper into a concept or leads to additional learning
- Answers open-ended questions by using observations, evidence, and previously accepted explanations



LESSON PLAN TEMPLATE

Grade Level:		
Lesson 1	Content Domain	
	Content Subdomain	
	Learning Objectives:	
Lesson 2	Content Domain	
	Content Subdomain	
	Learning Objectives:	
Lesson 3	Content Domain	
	Content Subdomain	
	Learning Objectives:	
Materials:		
Precautions:		

Preliminary

5E STEPS	
ENGAGE	
EXPLORE	
EXPLAIN	
ELABORATE	
EVALUATE	

	Engage & Explore	Explain & Elaborate	Evaluate
Engage Capture interest and Establish prior knowledge	<ul style="list-style-type: none"> Purpose of lesson is not clear or prior knowledge is not accessed. Essential questions or objectives are not clarified. 	<ul style="list-style-type: none"> Activity may be engaging, and essential questions or objectives may be mentioned, but connections are not drawn between objectives, prior knowledge, and activity purpose. 	<ul style="list-style-type: none"> Purpose and/or relevance of lesson is established. Student prior knowledge is elicited and/or activated. Essential/guiding questions or objectives are employed and continually revisited throughout.
Explore Construct knowledge Through questioning and active engagement in a learning task	<ul style="list-style-type: none"> Students are not actively engaged in the learning task and are not provided the opportunity for discourse. Instructor retains intellectual control of the session, or technology integration is not intentional. 	<ul style="list-style-type: none"> Students are either not engaged or not provided the opportunity for discourse. Materials/technology do not provide opportunities for students to interact with content. Instructor role supplants student role in the activity. 	<ul style="list-style-type: none"> Students engage actively in a learning task. Students are provided with opportunities for discourse. Materials/technology help students interact with content in a meaningful way. Instructor's role is facilitation rather than delivery of information to the largest possible extent.
Explain Interpret, clarify, and refine learning	<ul style="list-style-type: none"> Real-world connections are not present or explicit. Peer and teacher feedback are not present. All information is provided by the teacher. 	<ul style="list-style-type: none"> Some connections are made, but real-world connections are not explicit. Student interaction is somewhat present to help build understanding. 	<ul style="list-style-type: none"> Lesson provides opportunity for students to connect the learning activity with authentic learning and/or connect to the real-world. Lesson provides opportunity for students to ask questions and receive teacher and peer feedback that helps gauge their understanding. Questions (regarding the activity/or data collected) lead to the development of concepts and skills Includes a complete explanation of the concept (s), terms, and/or skill(s) taught

	Explain & Elaborate	Evaluate	Evaluate
Explain Interpret, clarify, and refine learning	<ul style="list-style-type: none"> Real-world connections are not present or explicit. Peer and teacher feedback are not present. All information is provided by the teacher. 	<ul style="list-style-type: none"> Some connections are made, but real-world connections are not explicit. Student interaction is somewhat present to help build understanding. 	<ul style="list-style-type: none"> Lesson provides opportunity for students to connect the learning activity with authentic learning and/or connect to the real-world. Lesson provides opportunity for students to ask questions and receive teacher and peer feedback that helps gauge their understanding. Questions (regarding the activity/or data collected) lead to the development of concepts and skills Includes a complete explanation of the concept (s), terms, and/or skill(s) taught
Elaborate Apply and generalize learning	<ul style="list-style-type: none"> No collaboration is present. 	<ul style="list-style-type: none"> Some collaboration is present. There is a logical transition from the explain phase but the elaborate learning activities doesn't encourage students to find real life (every day) connections with the new concepts or skills. 	<ul style="list-style-type: none"> There is a logical transition from the explain phase. Lesson includes collaboration. Lesson includes creation of new learning structures (where applicable).
Evaluate Assess learning	<ul style="list-style-type: none"> Assessment is not present or only present as summative assessment at the end of the lesson. 	<ul style="list-style-type: none"> Formative assessments are present, but there is no culminating product that articulates or synthesizes new knowledge. 	<ul style="list-style-type: none"> The evaluation criteria are clear, appropriate, and measurable Formative and summative assessments of learning progress are present. Culminating product or presentation articulates or synthesizes new knowledge. Evaluation includes <u>openended</u> questions about new learning.

THE OUTCOME APPLYING KNOWLEDGE

The teachers put it in practice the acquired knowledge by developing interdisciplinary projects with their classes.

Some of the projects developed with students



TRANSDISCIPLINARY LESSON PLAN

(Works across and beyond disciplines on major real-life problems, blurring boundaries and transcending disciplinary perspectives - approximately 7 blocks of 90 minutes)

Grade level	9th	
Lesson 1 Cidadanía e Desenvolvimento	Content Domain	Sexuality
	Content Subdomain	Values: Promote values of respect, inclusion and sharing
	Learning Objectives:	<ul style="list-style-type: none"> - Express respect for individual and sociocultural differences. - Express respect for oneself, for others and for the environment. - Demonstrate responsibility in affective and sexual relationships. - Develop self-confidence to express diversity in sexual choices.
Lesson 2 História	Content Domain	Sexuality
	Content Subdomain	Values
	Learning Objectives:	Know the differences in relationships over time and space.
Lesson 3 Espanhol	Content Domain	Sexuality
	Content Subdomain	Identity and Gender
	Learning Objectives:	<ul style="list-style-type: none"> - Educate students to be citizens free from prejudice and gender stereotypes. - Develop the awareness of being a unique person with regard to sexuality, identity, gender expression and sexual orientation; - Respect and accept diversity in sexuality and sexual orientation; - Promote the discussion about what are homophobic attitudes and behaviors and how they occur in the school context.
Lesson 4 TIC	Content Domain	Sexuality
	Content Subdomain	Creating applications for mobile devices.
	Learning Objectives:	Produce materials (Quizzis) on the themes of sexuality in the MIT App Inventor application and place them in the Classroom.
Materials:	Video; computer; cell phone	
Precautions / safety:	Internet usage rules	

Previous knowledge/preliminary

Basic notions about what it is: gender; the sex; sexual orientation, gender identity, transsexuality, transgender, Cissexuality, LGBTIQ+, Homophobia and Heterosexism.

5E STEPS ENGAGE

In the first phase of the class, it is intended to capture the attention of the students through the visualization of the video "In a heartbeat" placed in the classroom of the discipline. They are then invited to fill in a form with the following questions:
 -What is the theme of the film?
 - What was the relationship between the two boys?
 - What is the difference between the boy's attitude and his heart? Why are you so afraid?
 -Were you respecting yourself?
 - What are the reactions at school to others?



	<ul style="list-style-type: none"> - How would you act if you were in the same situation? - How would you react if you liked a friend of the same gender? - How do you react when you see two boys or two girls holding hands at school? Afterwards, the teacher will reflect/discuss with the class about the attitude and affections of the characters in the film. (Mentimeter - Word cloud can be used) (TABLE - KWL (Know, Wonder, Learned)) 																																				
EXPLORE	<p>Explore with students what they think, how they live and how they respect love and sexual relationships and how these values will be reflected in everything they do or say or don't do or don't say.</p> <p>Explore the difficulties and obstacles of being homosexual in society and at school based on the questions: Is there homophobia at school? As? Through jokes, harassment, violence? How is heterosexism imposed? On the posters that are spread around the school? In school supplies? What is the experience of non-heterosexual people at school? Are they rejected by their peers, or do they feel supported? Divide the class into 3 small groups of 3 to 5 students. The rest will be the observers. Each group is given a card with a scenario on attitudes towards sexual diversity to play a role-play. Each card will have a set of questions for each situation. The group will have to represent the action as they wish, according to the values they have defined. Give each group 10 to 15 minutes to plan and prepare the role-play. The audience of observers should be attentive to each presentation in order to identify the underlying values. At the end of all presentations, ask each student to respond individually in writing to the following questions: At the end of all presentations, through Mentimeter, answer the following questions? -What did you feel before each scenario and each character? -What stereotypes did you identify? -What kind of homophobia and heterosexism did you observe? -Which character do you identify with the most? -Were you able to identify values of equality, respect and inclusion?</p> <p>> In a large group discuss: - What can be done to make the school and the wider society a safe, healthy and inclusive environment? - What cooperation and mutual assistance measures can be developed to reduce situations of exclusion and sexual discrimination at school? (TABLE - KWL (Know, Wonder, Learned))</p>																																				
EXPLAIN	<p>Information is transmitted about:</p> <ul style="list-style-type: none"> - the different concepts worked on: the genre; the sex; sexual orientation, gender identity, transsexuality, transgender; Cissexuality; LGBTIQ+, Homophobia and Heterosexism. - homophobia in Portugal. - relationship differences across time and space. 																																				
ELABORATE	<p>Students in groups present and explain examples of values, using ICT, producing resources such as questionnaires and games that can be disseminated to the school community. (TABLE - KWL (Know, Wonder, Learned))</p>																																				
EVALUATE	<p>Formative and summative assessment Through the Mentimeter, students evaluate the activity and teachers use the following grid:</p> <table border="1"> <thead> <tr> <th>Rating scale</th> <th>TRUE</th> <th>LACKING</th> <th>FALSE</th> </tr> </thead> <tbody> <tr> <td>Students are able to identify values of respect, inclusion and sharing.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Students are able to recognize that respect for sexual orientation and sexual diversity is a human right.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Students are able to develop a group investigation.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Students are able to use ICT in the elaboration of their work.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Students are able to communicate the work done.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Students are able to reflect on what they know, what they want to know and what they learn.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Students are creative.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Students are autonomous.</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Rating scale	TRUE	LACKING	FALSE	Students are able to identify values of respect, inclusion and sharing.				Students are able to recognize that respect for sexual orientation and sexual diversity is a human right.				Students are able to develop a group investigation.				Students are able to use ICT in the elaboration of their work.				Students are able to communicate the work done.				Students are able to reflect on what they know, what they want to know and what they learn.				Students are creative.				Students are autonomous.			
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Padlet with the materials used and produced: <https://padlet.com/verlucosta/d5h8kzx58whtfng>



Interdisciplinary Citizenship project developed with the subjects of History, Spanish and ITC (9th form)

Being a good citizen in school and in the community

INTERDISCIPLINARY CLASS PLAN

Grade level		10 th
Lesson 1 Health	Content Domain	General notions about cells, immunity, tissues and organs, Osteoarticular and muscular system.
	Content Subdomain	Cells.
	Learning Objectives:	Recognize the cell as the structural and functional basis of the human organism. Know different types of cells.
Lesson 2 Biology	Content Domain	Diversity and biological unity
	Content Subdomain	The cell: structural and functional unit; basic cellular constituents.
	Learning Objectives:	Recognize the cell as the structural and functional basis of life Know different types of cellular organization Know the constitution of cells
Materials:		MICROSCOPE; laboratory equipment, mobile phone, PC,
Precautions / safety:		Laboratory rules; rules for observing the MOC and for internet safety

Previous knowledge/preliminary
- All organisms are made up of cells - Basic constitution of the cell

5E steps				
ENGAGE	In the first phase of the lesson we aim to capture the students' attention by visualising cells at the MOC How are living things made up? How is a cell constituted? (TABELA -KWL (Know, Wonder, Learned))			
EXPLORE	Small group exploration of various types of cells on the internet (ICT) Ask pupils to make a 3D model of cells. Research the materials they should use. (TABELA -KWL (Know, Wonder, Learned))			
EXPLAIN	Information is transmitted about: - cell constitution; - types of cells in the organism -Function of the cells - Function of the cell organism - possible materials to use			
ELABORATE	The pupils in groups present and explain the examples of the elaborated cell models. (TABELA -KWL (Know, Wonder, Learned))			
EVALUATE	Formative and summative assessment			
	Rating scale	TRUE	LACKING	FALSE
	Students are able to identify different types of cells			
	Students are able to identify different constituents of cells			
	Students are able to know the function of cellular organelles			
Students are able to argue their choice of cell model				

Interdisciplinary project developed with the subjects of Biology and Health (10th form)

Cells & Biological diversity and unity

Some photos of the elaboration of the plant cell



PLANNING OF THE INTERDISCIPLINARY PROJECT - CULTURAL SOIREE

Grade levels		10th and 11th
PHILOSOPHY	Topic	Values (for a more just society and active citizenship)
	Sub-theme	Human Rights
	Objectives:	To explain the importance of democracy for the organization of a more just society, based on the values of freedom, equality, peace and respect for human rights. To know the origin of the declaration of human rights. To raise awareness of the need to respect each and everyone of the rights set forth in the Universal Declaration of Human Rights in order to preserve peace. To develop critical thinking as a means of guarantee against political (and other) manipulation and disrespect of individual rights. To develop creativity from the conception of activities: dance, poetry, music, singing, theatre.
ENGLISH	Topic	A World of Many Cultures
	Sub-theme	Human Rights
	Objectives:	To understand the existence of a multicultural modern world. To recognize that despite cultural differences, all social organizations should strive for the fulfillment of human rights. To know the origin of the Declaration of Human Rights. To develop critical thinking as a way of ensuring good social coexistence practices with reference to respect for the Universal Declaration of Human Rights. To develop creativity from the conception of activities: dance, poetry, music, singing, theatre.
PORTUGUESE	Topic	Political dimension of speech - Written and oral expression
	Sub-theme	Human Rights
	Objectives:	To recognize the importance of argumentation in the political dimension of a society. To develop argumentative skills in the service of the implementation of democratic values based on equality, freedom, peace and respect for the fundamental rights of each and every individual. To develop creativity from the conception of activities: dance, poetry, music, singing, theatre.
PHYSICAL EDUCATION	Topic	Body expression
	Sub-theme	Aesthetic values
	Objectives:	To develop activities that promote body expression such as dance. To design harmonious choreographies. To promote creativity.
Materials:		Videos, sound table, audiovisual materials, microphones, backdrops, lights, poems, musical instruments, closet, multipurpose room.
Precautions/safety::		Crowding of the multipurpose room; respect the use of the entrances and exits of the space.

Prior knowledge
<ul style="list-style-type: none"> Theory of Justice - social organization. Values of citizenship: democracy, equality, fraternity, human rights, human dignity. Multicultural societies (world). Universal Declaration of Human Rights.



Interdisciplinary project developed with the subjects of Philosophy, Portuguese and Physical Education (10th 11th and 12th forms)

Cultural soiree on Values and Human Rights

THE IMPACT OF THIS PROJECT

This project funded by the Erasmus+ Programme KA101 - Mobility of School Education Staff for learning purposes, allowed the mobility of 10 teachers from the Agrupamento de Escolas da Lixa, focusing on their professional development in order to empower and motivate them for the change that today's school requires. On their return, the dissemination of the learning activities carried out in an international context fostered the sharing of knowledge and the reflection on those experiences promoted, and will continue to promote, the development of the competences of other professionals and, mainly, the integration and contextualised transfer of new knowledge to the school and classroom.

The impact of the project was felt both at a systemic level, in the organisation of teaching and learning processes, and at the level of pedagogical practices and attitudes of the educational staff, which tends to be more open to educational innovation and to the participation in collaborative processes taking place in an international environment. It's also important to refer the development of the English language skills of the participating teachers and the internationalisation of the Agrupamento de Escolas da Lixa.

School: Agrupamento de Escolas da Lixa, Felgueiras, Portugal

Training centre: EduMore, Mersin, Turkey



Co-funded by the
Erasmus+ Programme
of the European Union