Heritage and Computational Thinking: intersections for meaningful learning in primary school

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Culture

Education

Preserving values

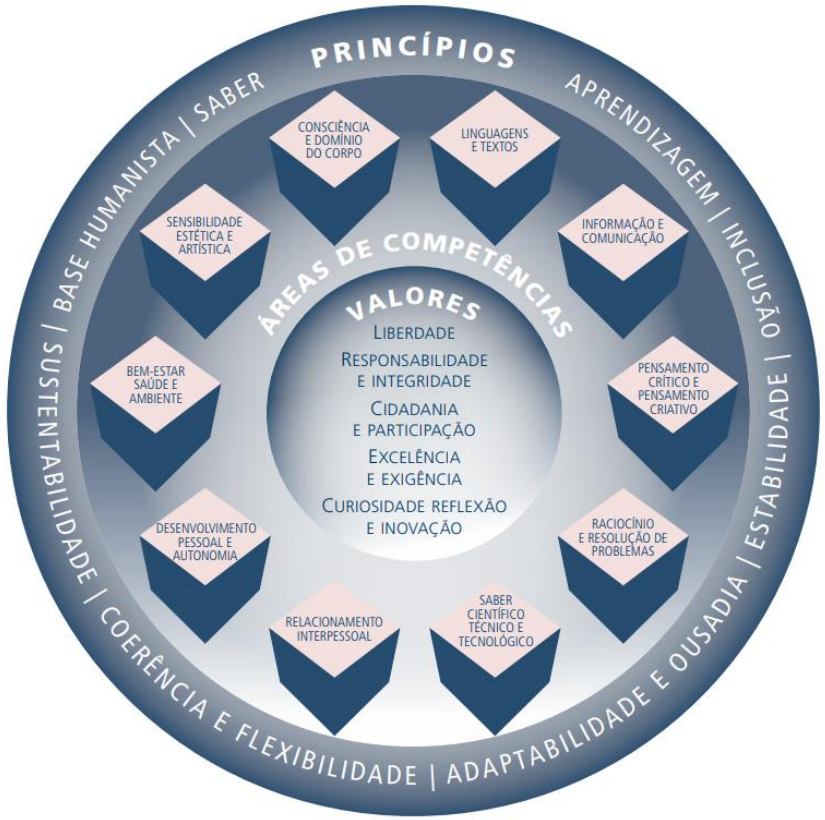


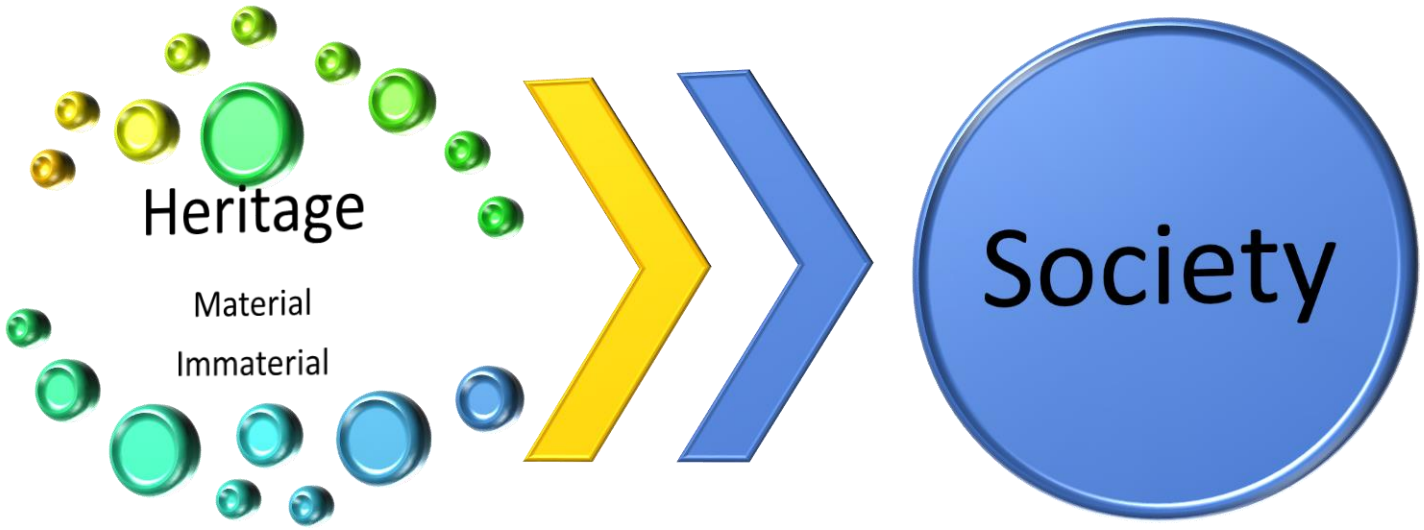
Figura 1 – Esquema concetual do *Perfil dos Alunos à Saída da Escolaridade Obrigatória*.

National Curriculum

Autonomy
and
curricular flexibility

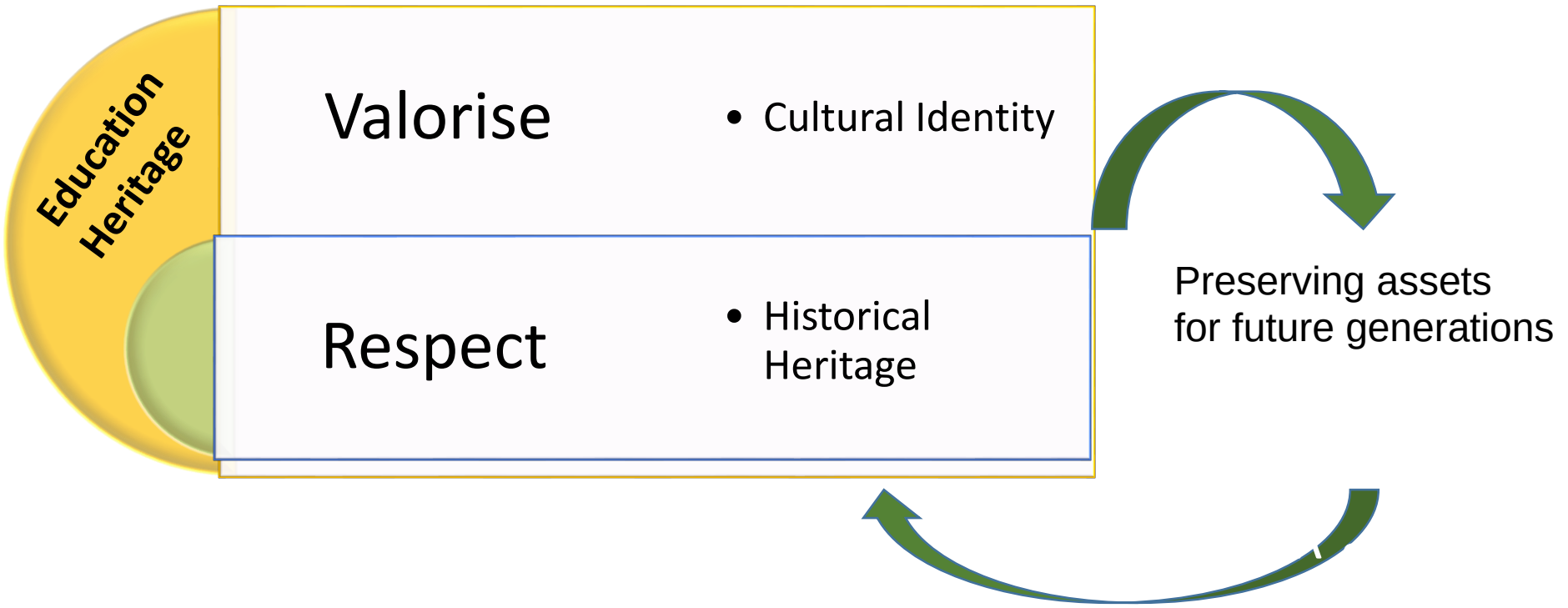
Inclusion
Meaningful training
Intervention in the social environment

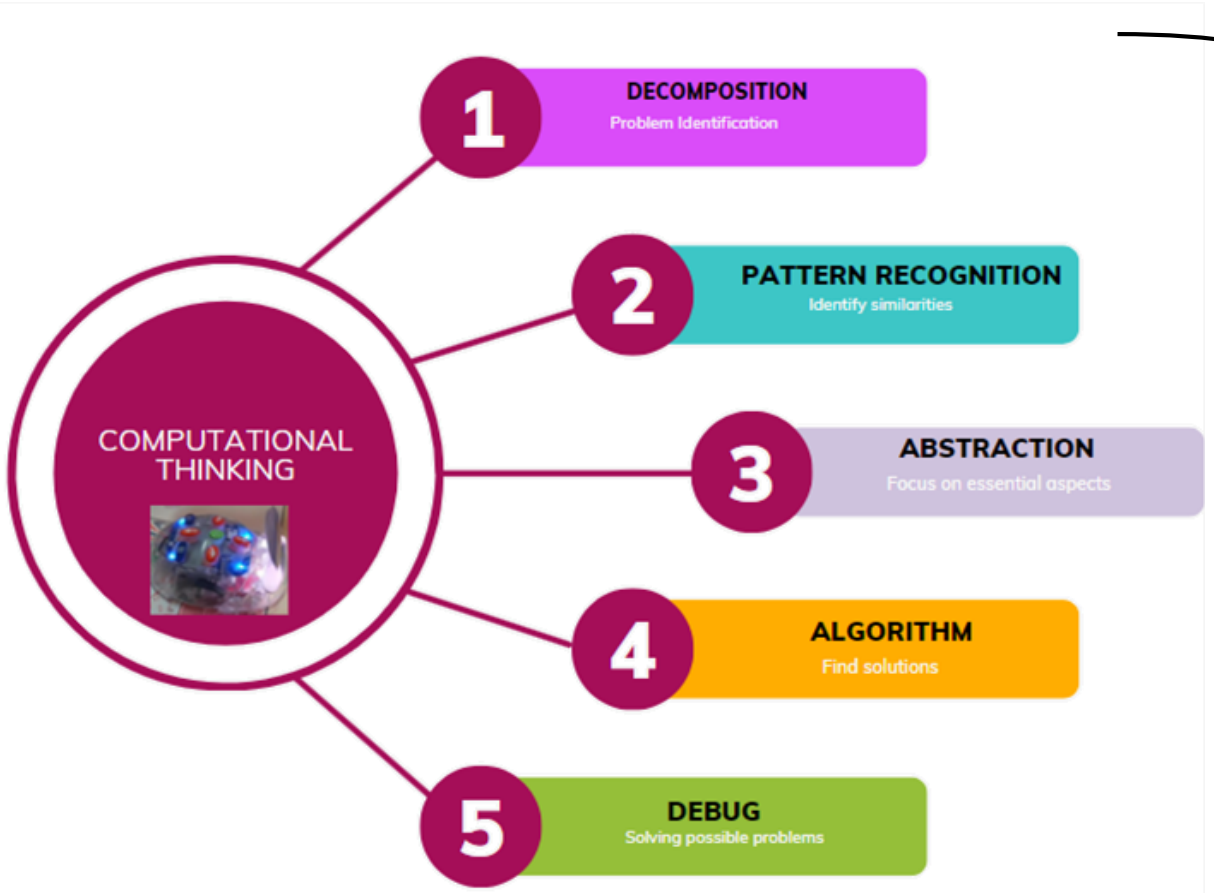
https://www.dge.mec.pt/sites/default/files/Curriculo/Projeto_Autonomia_e_Flexibilidade/perfil_dos_alunos.pdf



Citizenship

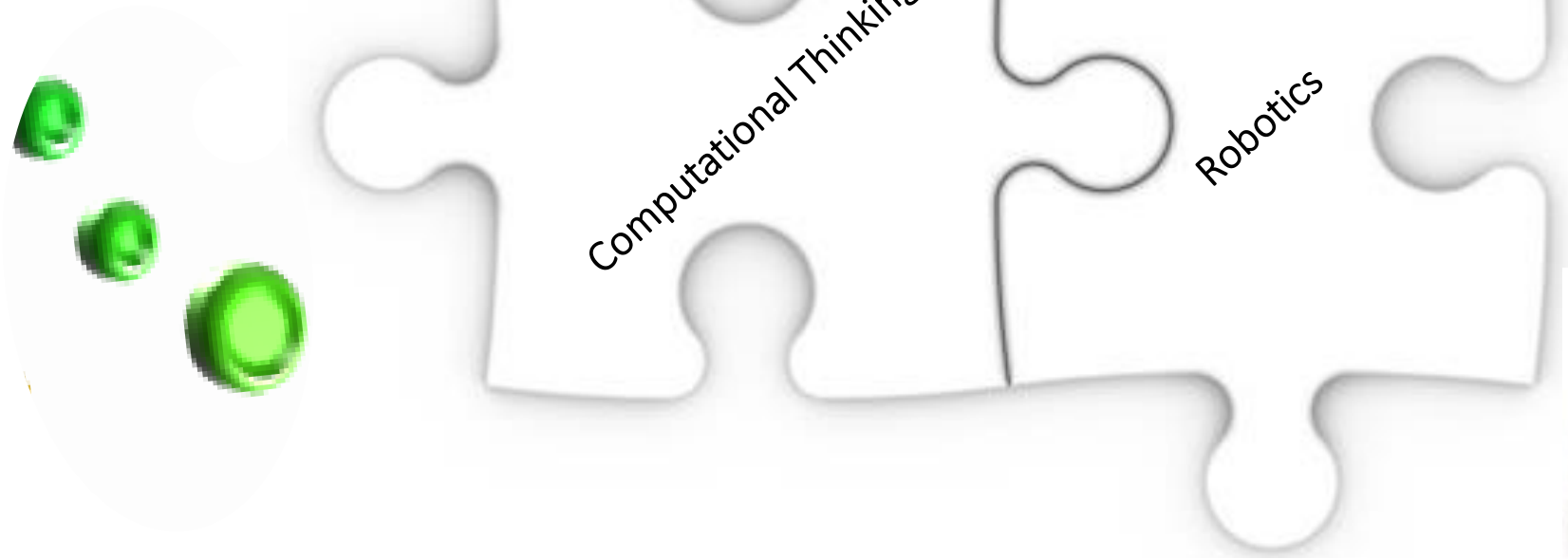
Collective Identity


Education Heritage
Valorise
• Cultural Identity
Respect
• Historical Heritage
Preserving assets for future generations
A living connection between children and the past



Computational thinking
is a capacity that involves Identifying

Identify
Understand
Interpret
Recognize
Solve
Evaluate/Reformulate



Stimulates interdisciplinarity
Increases involvement
Improves performance

- **Methodology**

✓ **an exploratory case study** of a qualitative nature

✓**Supervised Teaching Practice**

✓**Data collection:** participant observation, carried out by institutional supervisors, and recorded memories, such as photography and video.

✓**Participants:** around 40 children between the ages of 6 and 8, attending primary school in two school groups.

The students in the practices were asked for their informed consent to carry out this study, as required by the Ethics Committee of the InED (Centre for Research and Innovation in Education).

Description of two educational practices

- **Plan 1- 3rd year** of school
- **Curriculum articulation -** Heritage and local history + financial education + computational thinking
- **Methodology -** Simulation as a pedagogical tool for experiential learning
- **Problem question:** Cruise ships full of tourists often arrive in Leixões. How can we make our city known to tourists?
- **Resources -** Blue Boot, QRCode, Google maps, avatar

Objectives - To make the material heritage of the city of Porto known through simulation. Groups of children take on the role of guides and manage the money for an itinerary and buying a snack, so they decide on the best route.

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Porto Baroque

Porto Medieval

Tiles from Porto

19th century Porto

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Bem-vindos ao Porto Barroco!
Se estão prontos para começar, carreguem no botão "Iniciar".

Porto Barroco

Igreja do Carmo

Igreja da Misericórdia

Igreja e Torre dos Clérigos

Igreja de São Francisco

Igreja de Santa Clara

Igreja de Santa Clara

Interior da Igreja de Santa Clara

VOLTAR

FIM DA VIAGEM

	A	B	C	D	E	F
1						
2						
3						
4						

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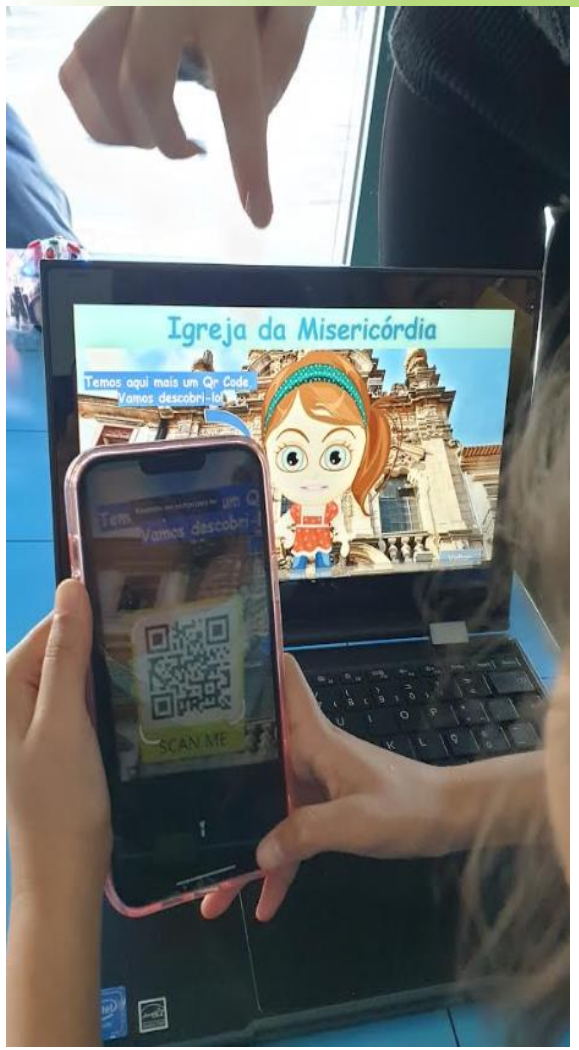

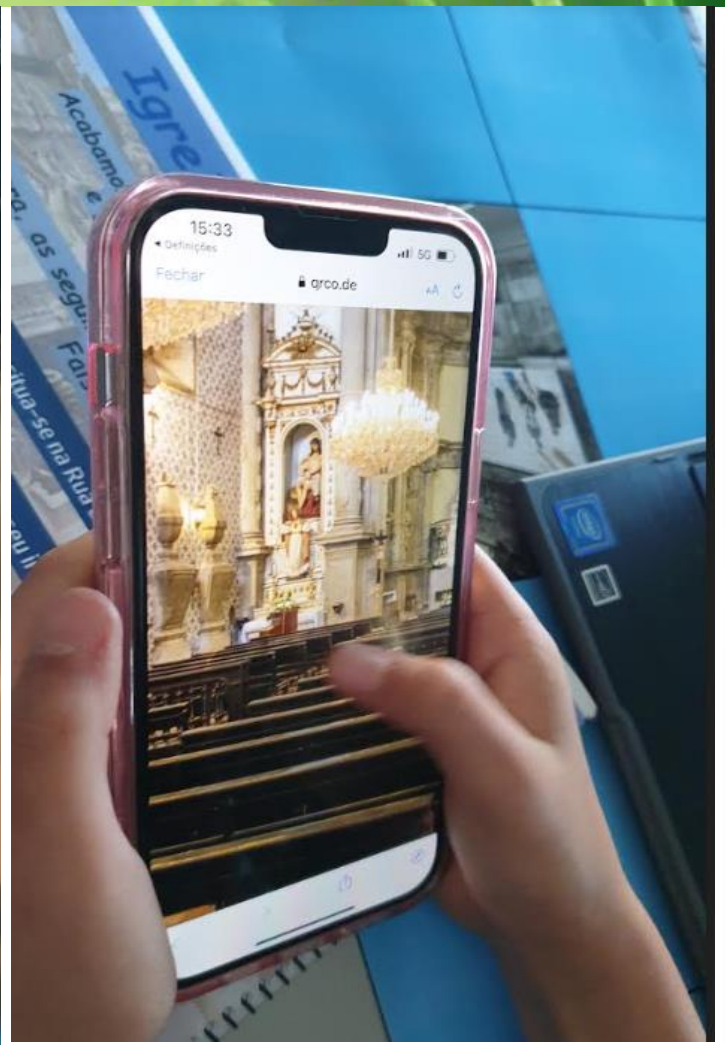

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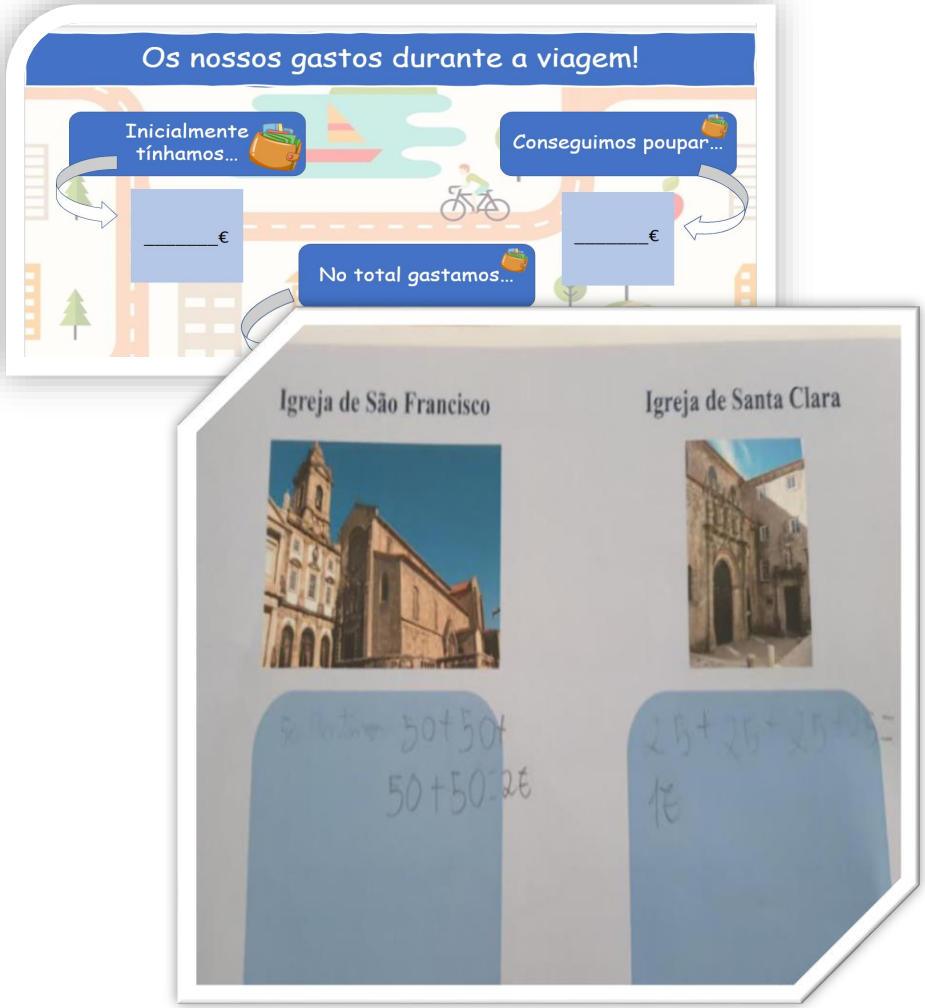

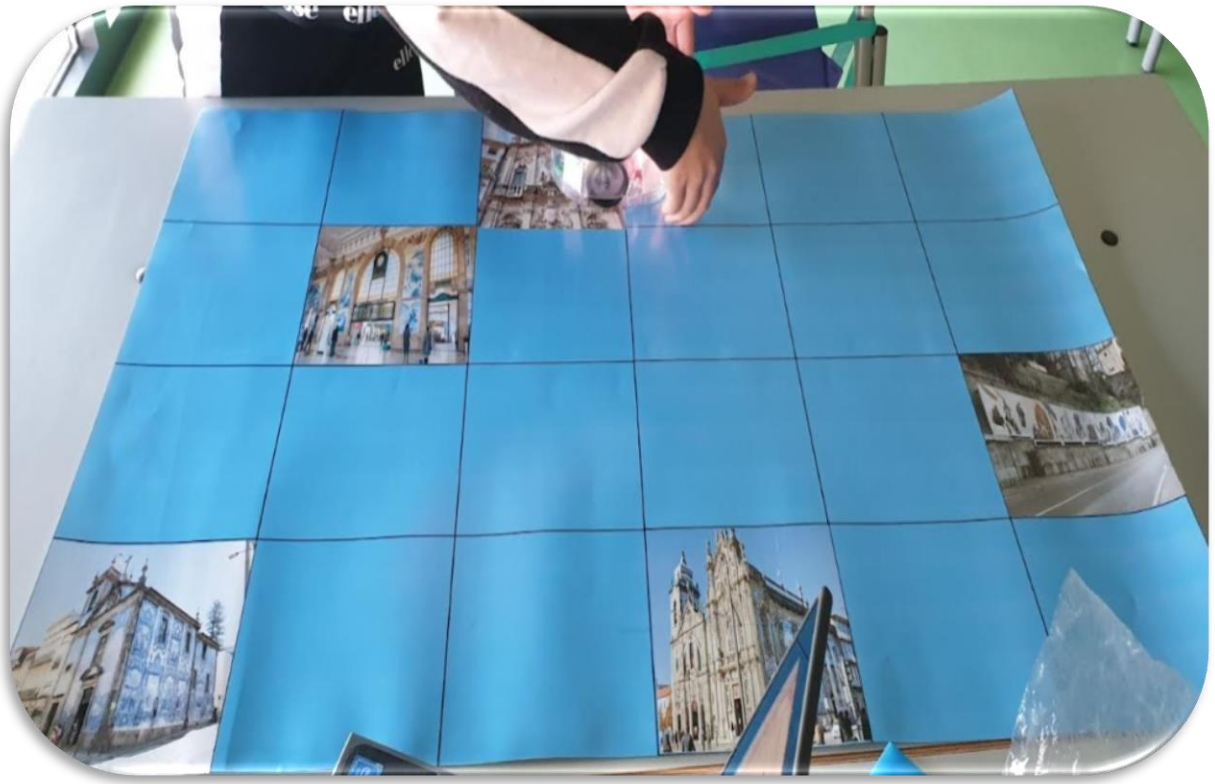

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Guia Oficial do Porto Medieval – 2022

Guia Oficial dos Azulejos do Porto – 2022

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Guia Oficial do Porto do século XIX – 2022

Igreja do Carmo

Já passamos pela Igreja do Carmo e ficamos a conhecê-la! Gostaram de conhecer este monumento?

1. Descubram e risquem os intrusos no seguinte texto:

A Igreja do Carmo, construída no **ano/século** XVIII, pela Ordem Terceira do Carmo, é um dos edifícios mais notáveis com a sua fachada possuidora de um painel de **madeira/azulejos,** representando cenas alusivas à fundação da Ordem Carmelita e ao Monte Carmelo. Esta igreja foi classificada, em **2013/2015,** como Monumento Nacional.

2. Rodeiem a opção correta.
A Igreja do Carmo é um dos principais monumentos da cidade:

a) Do Porto
b) De Braga
c) De Aveiro

Description of two educational practices

Plan 2- 1st year of school

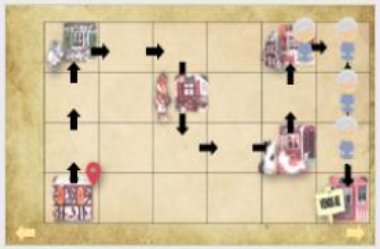
Curriculum articulation - Oral heritage (Story of Little Red Riding Hood (adapted) + Family, Computational thinking

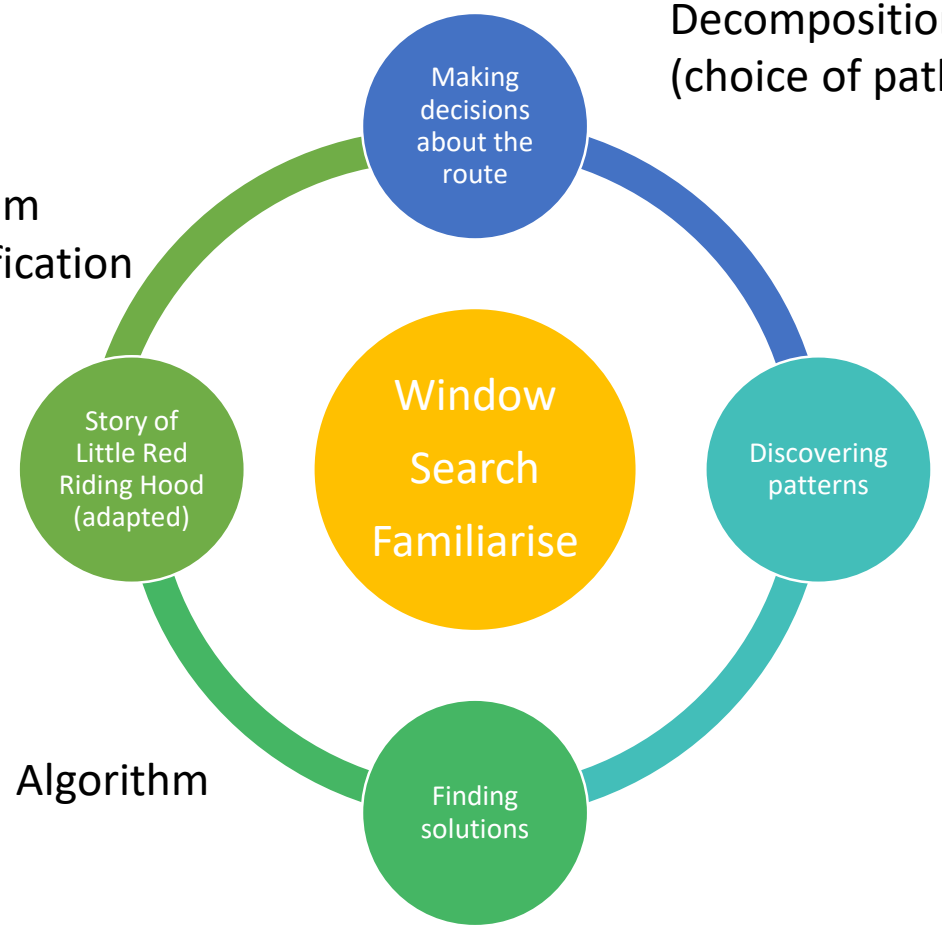
Methodology - Simulation as a pedagogical tool for experiential learning

Problem question: Little Red Riding Hood is getting married and Granny is going to her wedding. What route should Granny take to get to her granddaughter's house in good health?

Resources - Blue Boot, Mesh, PowerPoint

Objectives - Based on the story of Little Red Riding Hood, discover the grandmother's route to get to her granddaughter's house.

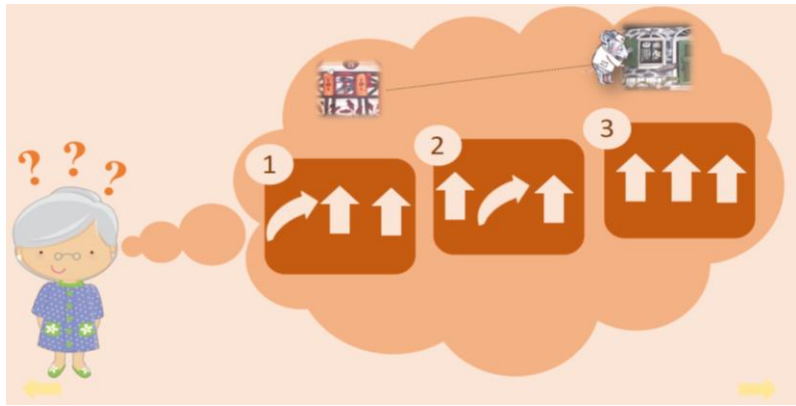




Decomposition (choice of path)

Problem identification

Algorithm



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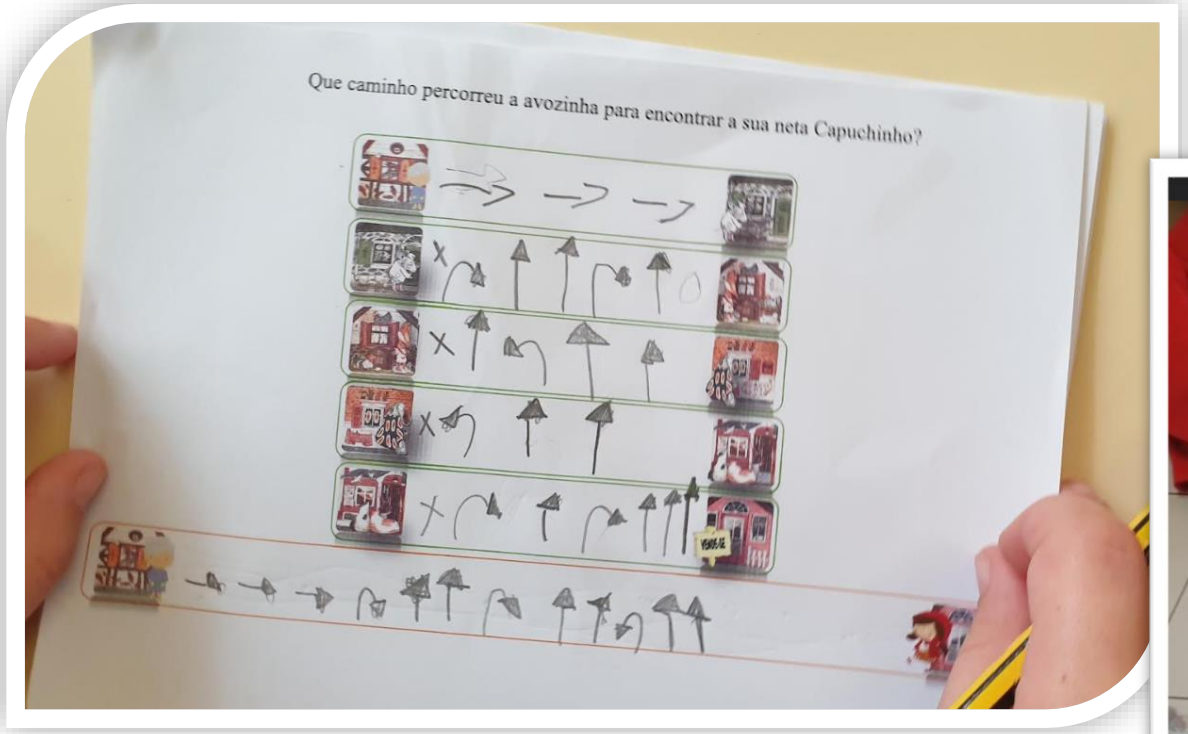

Discussion of results

Educational practice	Connecting computational thinking with history and culture	Connecting computational thinking with the present and the future	Stimulating problem-solving skills using a robot
Plan 1	- Baroque Porto, Medieval Porto, 19th century Porto and Porto tiles.	- "**choosing** the monuments they wanted to visit, as well as the order in which they would visit them" - "**discovering** each site" - "**creating** an itinerary for visiting the monuments"	- "**checking** the amount of money they had in their wallets to be able to visit the places in Porto" - "**calculating** the price of tickets for each place" "Blue-bot - moving it around the grid by answering a set of challenges associated with each location"
Plan 2	Traditional oral tales: -the oral tradition story "Little Red Riding Hood"	-"Family spaces in close connection with the construction of ethics and citizenship"; - "the characters of the oral tradition, characterising them in **a participatory dialogue**"; -"**reflections on** the story and the need to solve some maths problems in connection with the theme of family and citizenship"; - "The operationalisation of the itineraries allows for the **creation** of a new story".	-"identification of the problem (abstraction) and was carried out autonomously under the guidance of an audio (avatar) for execution on a mesh using a robot, Blue-Boot"; - "the avatar presented appropriate representations to facilitate understanding of the problem"; -"he had to recognise patterns and make decisions beforehand in the face of the challenges proposed by the avatar and these were recorded in a script to be finally materialised through the use of the robot" - "...each code to be chosen represented a route from one image to another"; - "the student makes sure that the code works with the robot, or corrects the error"

INTERDISCIPLINARY CONNECTIONS

Final considerations

How do the different components of computational thinking promote the construction of historical and cultural knowledge experienced by children in the classroom?

In the 1st plan, students were guided towards discovery through the stages of computational thinking

In the second level, the students had simplified solutions to make decisions and finally find the algorithm to debug with the robot.

The permanent connection with material/immaterial heritage, in a reflective dialogue, involved the student in learning intentions about everyday phenomena as a resource for critical learning and the development of mathematical reasoning.

The expression of value judgements developed analytical and communication skills.

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Thank you for listening!

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