# Heritage conceptions, perceptions and learning context: research on primary and secondary schools in Andorra

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#### Abstract

**Purpose** – Heritage education is currently a consolidated discipline, which advocate for a holistic vision of heritage. In this sense, this research aims to study the heritage conceptions, perceptions and learning context amongst primary and secondary students, comprehensively and fully.

**Design/methodology/approach** – This research focuses in Andorra, a country in the Pyrenees, where there are three different education systems. This allowed the study to obtain a sample of 1,235 primary and secondary students, throughout a structured questionnaire that was previously designed and validated ad hoc.

**Findings** – In general terms, the results show that around half of the students have a holistic view of heritage; however, natural and historical elements are highlighted as the ones they learn from the most, especially through visits *in situ*. Moreover, the students' perceptions of heritage show that over a 90% of students believe it is important to safeguard because it is connected to nature and culture preservation.

Originality/value – This research is included in a greater scope project that also considers other agents in the education community that belong to formal and non-formal spheres. In addition, it is the first investigation

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This study has had the complicity and support of the Ministry of Education of the Government of Andorra, who understood the project as a national opportunity to discover the students' conception, perceptions and learning context of heritage education. In this way, the authors would like to thank the teachers and students from the primary and secondary schools participating in this study.

This project has been developed thanks to the inter-university collaboration between the Interdisciplinary Research Group in Education (GRIE) from the University of Andorra, especially the statistical assistance of Betlem Sabrià, PhD, and the Chair of Education and Intangible Heritage of the Pyrenees (CEPIP) from the University of Lleida.

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where the field of heritage education is studied globally in an entire country, considering primary and secondary education students.

**Keywords** Heritage education, Primary education, Secondary education, Heritage conceptions, Heritage perceptions, Heritage didactics

Paper type Research paper

#### 1. Introduction

## 1.1 The importance of heritage in a globalized world

Heritage, as a living witness of the past but also, as a crucial element for future generations, has received the attention of international institutions, such as the Council of Europe, (hereinafter CoE), and the United Nations Educational, Scientific and Cultural Organization, (hereinafter UNESCO), in order to achieve new agreements and implement policies on economic, social, educational, legal and administrative basis (Jagielska-Burduk and Stec, 2019; Barrett, 2020). Recently, one of the main actions that has impacted heritage and was a joint effort by the CoE and UNESCO, is the Framework Convention on the Value of Cultural Heritage for Society, (hereinafter Faro Convention) (Council of Europe, 2019). In this sense, the Faro Convention has created a new common framework which helps society to see the potential of heritage internationally and its deep connection to human rights and diversity, democracy and sustainability (Zagato, 2015, Council of Europe, 2019).

With regard to this common framework, governments around the Iberian Peninsula have taken different efforts to foster heritage education in their systems. As a matter of fact, in Andorra, a publication by the government called "The White Book of Culture" has stated the importance of continuing working with collective heritage and safeguarding heritage through education (Govern d'Andorra, 2021). Moreover, in a neighbour country, the Spanish Heritage Observatory and the National Plan for Education and Heritage had established as two main elements so as to analyse, manage, safeguard and protect national heritage with the main focus on heritage education and its impact (Fontal, 2016a). Finally, in the Portuguese context exists a current area of study exclusive for primary education students, and directly related to how heritage is taught in school and its relationship with diverse typologies of heritage elements (Miranda, 2021).

#### 1.2 The potential of heritage education

Heritage education, understood as an essential discipline which allows the connection between heritage and people (Fontal and Ibáñez-Etxeberria, 2015), which studies the learning processes derived from those connections (Fontal, 2003) and is present in either formal and non-formal education (Fontal, 2016b), has strengthened due to the new common frameworks, established by the CoE and UNESCO a few decades ago (Jagielska-Burduk and Stec, 2019). This helped to consolidate it as an important scientific area of research, reflected by the increase in innovation projects, thesis and high impact publications (Fontal et al., 2017).

According to Fontal (2003) heritage education could be considered as the educational mediation tool in heritage construction processes and their understanding. It must seek not only the integral development of the subject and its capacities in all its dimensions (affective, social, spiritual, intellectual and interpersonal), but at the same time it must favour the processes of valuation, conservation, respect and transmission. In this sense, heritage education not only gives a context for the development of curriculum subjects and new materials related to what is current, but it also sharpens perceptions, fosters personal enquiry and problem-solving skills and facilitates citizens to identify the potential of heritage in the future and connects heritage to society's development (Barghi *et al.*, 2017)

Hence, to encourage, not only knowledge regarding heritage, but the active participation Journal of Cultural of individuals in safeguarding actions, it is key to develop strategies to succeed in developing values and attitudes of interest, together with respect towards heritage (Morote and Colomer, 2021; Yáñez and Gómez-Trigueros, 2022). Innovative pedagogical activities around heritage are often designed considering different topics that are appealing and controversial for students in order to trigger active participation from individuals, since it is essential to develop strategies that promote interest and respect for heritage (Estepa-Giménez and Martín, 2020; Ortega-Sánchez and Gómez-Trigueros, 2019; Trabajo-Rite and Cuenca-López, 2020).

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## 1.3 Holistic approach to heritage education

An holistic approach to heritage education comprises tangible and intangible elements, as well as natural phenomena, which because of their history, aesthetics or uniqueness become reference points for society's identity construction (Jiménez et al., 2010). In this sense, a holistic view of heritage education allows students to learn from cultural and natural sources of social knowledge (Cuenca, 2004). With this view, students identify diverse topics and elements they are connected to, in order to discover them together with others that are also part of the community, and to raise awareness of the importance of safeguarding those for future generations, as well as to encourage students to become actively involved in its preservations and dissemination (Pinto and Zarbato, 2017; Casanova et al., 2018; Cuenca and Pérez, 2021).

When looking at investigations made on the topic of heritage education in the Iberian Peninsula, articles arise regarding the role of heritage in Spanish education centres, the link between heritage and committed citizens, as well as regarding the impact of heritage didactic proposals for teenager students (Santacana et al., 2016). In this sense, Marín-Cepeda and Fontal (2020) exhaustively collect that there are many investigations that delye into the concept, its perceptions and learning experiences, but little focus on a holistic scope is found. In this sense, new publications arise highlighting the need to break with traditional or outdated approaches that separate heritage, since important assets exist in all heritage categories to safeguard and preserve it (Koch and Gillespie, 2022; Piccardo et al., 2022). Regarding this gap and according to the Social Rights and 2030 Agenda Ministry (2021) which considers the lack of projects fostered in the area of the Pyrenees, the research study introduced focuses on the importance of studying heritage education approach and its impact on students' conception, perceptions and learning experience (hereafter "learning experience", "learning context" or "didactic experience") comprehensively and fully in a specific context which is Andorra, an independent country located in the north of the Iberian Peninsula, among the Pyrenees, with a socio cultural reality similar to the neighbourhood region of Catalonia (Spain). Concerning heritage, it has characteristics comparable to this Spanish territory, for example, in terms of landscape, art, language, traditions and festivals. Regarding education, given its geographical location, there is the possibility of having French, Andorran or Spanish formal education, but there is a single curriculum in which the national heritage is worked on.

#### 1.4 Research objectives

The main aim of this research is to study the conceptions, perceptions and learning context of heritage among primary and secondary education students in a specific country, Andorra, In order to do that, three specific objectives have been developed:

- (1) To identify heritage conceptions, considering the different typologies and circles of appropriation in primary and secondary students.
- To analyse the didactic experience of heritage in primary and secondary students.

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(3) To determine the importance of heritage and its safeguard according to primary and secondary students' perceptions.

## 2. Research methodology

## 2.1 Context and participants

The project was carried out during the 2021–2022 academic year and considered the formal and non-formal spheres, which allows us to have a broad vision of the degree of importance that society grants to heritage, in this case in Andorra. Given the vast number of data collected, this study will focus on analysing the primary and secondary students' results.

The project was developed in Andorra, a state with a total population of 80,664 inhabitants (Department of Statistics, Government of Andorra, 2022), wherein three educational systems coexist: Andorran, Spanish and French. The study was conducted within 15 primary and secondary schools (public and semi-private) from all three educational systems with a total real population of 1,446 students, considering the levels wherein the questionnaire was conducted (Department of Statistics, Government of Andorra, 2022). The final sample of the study was 1,235 students (Table 1), providing a high degree of educational context representativeness to obtain coherent and significant results.

In order to conduct this study, the Ministry of Education of the Government of Andorra facilitated the access to the primary and secondary schools of the three educative systems, which makes this study a national project. They were willing to participate if different pragmatic factors existed, such as the written informed consent by parents and students for the study, the interest of the teacher and the available time. The administration of the questionnaire was carried out along 30 min in paper or online format according to the preferences of each school.

# 2.2 Research design

The study is a mixed quantitative-qualitative method designed with a non-experimental paradigm. On the one hand, quantitative data was used to apply a statistical and correlational methods to uncover relationships between variables. On the other hand, the qualitative data leads us to going deeper into detail on the interpretation of the relationships between variables from the quantitative data (Creswell, 2014).

#### 2.3 Data collection

To examine the conceptions, perceptions and learning context of heritage in primary and secondary students, we collected quantitative and qualitative data through a questionnaire,

Educational level	Educational system	Frequency (n)	Percentage (%)
Primary education	Andorran	249	20.16
Timaly oddedion	Spanish	187	15.14
	French	236	19.11
Total primary education		672	54.41
Secondary education	Andorran	428	34.66
ž	Spanish	111	8.99
	French	24	1.94
Total secondary education		563	45.58
Total sample		1,235	100
Source(s): Table created by au	ithors		

**Table 1.** Breakdown of the study sample

which was designed and validated by a group of seven experts composed of primary and Journal of Cultural secondary teachers, university lecturers and technicians and managers of the Ministry of Education of Andorra Government.

The group of experts had more than ten years of experience in heritage management and/ or teaching or academic practice. They were assessed in the questionnaire by attending to the criteria published in Carrera et al. (2021): (1) the unicity and linguistic precision of the questions for its understanding; (2) the relevance, adequacy and relationship of each question with the object of evaluation; and (3) the importance, the degree of interest of each item in relation to the objective of the study. Definitions of "unicity", "relevance" and "importance" were provided to the group of experts before conducting the questionnaire validation. After a few iterations, the final questionnaire was validated with a total agreement between the group of experts.

As shown in Table 2, the questionnaire consisted of an initial section to collect the participants' sociodemographic information, followed by 17 open-questions and multiple choice closed-questions distributed in three dimensions: (1) heritage conceptions (3 multiple choice closed-questions); (2) didactic experience and learning context (4 multiple choice closed-questions and 3 open-questions); and (3) importance of heritage and its safeguard (2 multiple choice closed-questions).

## 2.4 Data analysis

Firstly, the paper questionnaires were emptied into a digital format to homogenize the data in a single database for subsequent statistical treatment. Afterwards, the answers from the

Dimension	Sub-dimension	Structure	Questions
1. Sociodemogr	raphic data	Item 1	Name, birth and residence city, birth date, age, genre, level of studies (primary/secondary education), school and educative system
2. Heritage con-	ceptions	Item 2.1	From the following list, select the elements you believe are considered heritage (maximum of 4)
		Item 2.2	Which of the following heritage elements do you know better? (maximum of 4)
		Item 2.3	Mark the right answer regarding the location of the following heritage elements in Andorra
3. Didactic experience	3.1. Academic scope	Item 3.1.1	From the following types of heritage, select the ones you've learned from in class
-	-	Item 3.1.2	Have you ever discovered and/or visited a specific heritage element with your class? If yes, which one/s?
		Item 3.1.3	From the following list, select which kind of activities or resources you have used in school to learn from heritage
		Item 3.1.4	Regarding the activities or resources used to learn from heritage in school, which ones do you consider the best ones to learn?
	3.2. Social scope	Item 3.2.1	Have you ever discovered and/or visited a specific heritage element with your class, outside your school? If yes, which one/s?
		Item 3.2.2	Select the option/s that describe the best how you have discovered heritage outside school
		Item 3.2.3	Do you belong to a group, community, association, etc. that is related somehow to heritage (cultural, natural,)? If yes, which one/s?
	of heritage and its	Item 4.1	Why do you think getting to know heritage is important?
safeguard		Item 4.2	What are the effects that may arise from heritage loss?
Source(s): Ta	ible created by autho	ors	

Table 2. Questionnaire structure

Heritage

Sustainable

Development

Management and

qualitative questions have been categorized to be able to analyse the results together with the quantitative data. Statistical analysis was done using the IBM SPSS Statistics 28.0.1.0 Software (IBM Corp, 2021). The results were evaluated at a significance level of 95%.

Analysis with the mentioned software provided general descriptive statistics regarding all the dimensions from the questionnaire (Table 2), as well as a specific chi squared tests of independence between some categorical variables in order to determine whether they are likely to be related or not for the consequent interpretations of the findings. The categorical variables selected to run the independence test are strongly associated to the two main categories of the questionnaire (heritage conceptions and the didactic experience) and are displayed in a contingency table, where each row and column represents a variable category.

## 3. Findings

On the whole, the following section displays the results and its discussions for each of the objectives presented beforehand. For each one, different questions of the questionnaire (Table 2) have been analysed; foremost, the conceptions that students have on heritage, followed by their didactic experiences when learning from heritage and, lastly, the importance of heritage and its safeguard for those students.

## 3.1 Conceptions of heritage

Heritage conceptions amongst students have been measured using the responses obtained in the second part of the questionnaire, including Items from 2.1 to 2.3.

3.1.1 Holistic view on heritage. The Item 2.1 of the questionnaire asked what students consider heritage between some elements of different nature (historical-artistic, natural, industrial, intangible). The most selected options from the list (church, natural park, water mill, traditional dance, gorge, site, factory, Mediterranean diet, Catalan language, urban park) were four historical-artistic, natural or intangible elements, chosen in more than 50% of the students. However, to perceive if they had a holistic view, from the responses collected, a new variable was inferred taking into account the students that selected heritage elements from three or four different typologies. The results from this variable are specified in Table 3, where answers from students are distributed by education level.

The results show that around half of the students have a holistic view of heritage (51.2%), according to the total sample, but secondary students (52.84%) in a slightly broader way when compared to primary students (47.15%). A difference of the 5.69%, that could answer to, on one hand, that in the early stages of education, students tend to explore mainly cultural spaces (museums, churches, civic monuments, etc.) and, on the other hand, and according to Marín-Cepeda and Fontal (2020), it could also be due to teachers' training. In fact, the study of Estepa *et al.* (2008) suggests that the conceptions from teachers according to a holistic view of heritage are largely determined by the subject studied at the university. In short, Geography-History teachers and Biology-Geology teachers have a broader perspective of conceptions

		three or four different (holistic view)
	N	%
Primary education	298	47.15
Secondary education	334	52.84
•	632	100
Source(s): Table created by authors		

Table 3. Students' holistic view

about heritage than primary school teachers. Thus, these findings highlight the importance Journal of Cultural of teacher training and in-service courses (Fontal *et al.*, 2017; López-Fernández *et al.*, 2021). Heritage

3.1.2 Perspectives on national and international heritage. Item 2.2 in the questionnaire asked students to choose the heritage elements they knew the best, considering national and international options. Thus, from this question, the research theme inferred that if students selected three or four national elements it would mean those students knew more about national heritage, and the same logic was followed for international heritage. In this sense, Lopez-Fernández et al. (2021) highlight that in the early childhood and primary education curriculum there is a centrality of knowledge and exploration of the surrounding environment and use of local spaces for didactic purposes, which leads to a better knowledge of the nearby environment. Following this idea, in Table 4 is observable how students from primary education select more national elements (64.75% of national elements vs. 46.55% of international elements). As for secondary education students, results shift, since more students selected international heritage (53.45% of international elements vs. 35.25% of national elements).

3.1.3 Location of Andorra's different typologies of heritage. It can be found more than twenty questions (Item 2.3) asking students to locate different heritage elements placed and/or celebrated in all Andorran administrative parishes (locally known as "parròquies"). Heritage elements were divided in the following four categories: Churches and monuments, Houses-museum and museums, Traditional festivals and Natural areas (Figure 1).

Figure 1 shows how churches and monuments were located correctly in over 50% of the cases, and local houses and museums around 50%, either in primary and secondary education. In this way, and as previously mentioned, throughout the first educational stages, there is a higher knowledge in material historical-artistic heritage, which corresponds to the historical construction of what is known as heritage, according to Conde and Armas (2019). This tendency can also be observed in Marín-Cepeda and Fontal (2020) work, in which this type of heritage is also the most well-known among the secondary school students.

Moreover, traditions and festivals were better located by primary students, differing by over 10%. Marín-Cepeda and Fontal (2020) also highlight the low knowledge of traditions by secondary school students since they have little awareness of the meaning of intangible heritage. Finally, natural areas, which have the lowest percentage, were located slightly more correctly by secondary education students. According to Morón-Monge *et al.* (2012), the environmental heritage is worked in secondary curriculum valuing such space, species, landscapes, etc. Even so, environmental heritage in secondary education textbooks is not usually treated from a holistic view of heritage.

## 3.2 The didactic experience of heritage

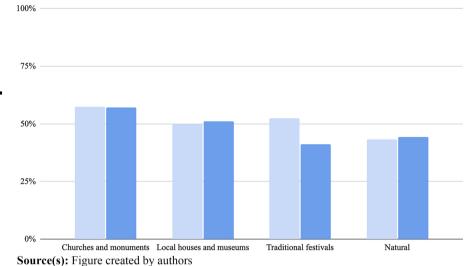
The didactic experience of students from both primary and secondary education and the learning context where those experiences are fostered, specifically linked to heritage education, are assessed using the responses from the main questionnaire from Item 3.1.1 to Item 3.2.3.

	three nationa	ts answer or four l heritage nents	three inter	ts answer or four national e elements	with thre comp	students ee or four bleted wers
-	N	%	N	%	N	%
Primary Education Secondary Education	191 104	64.75 35.25	128 147	46.55 53.45	209 251	100 100
Source(s): Table created	by authors					

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**Table 4.** Students' knowledge of national and international heritage





Primary education Secondary education

Figure 1. Students' right answers on location of Andorra's different typologies of heritage

3.2.1 Typologies of heritage studied in school. Regarding the didactic experiences, students were asked to select the types of heritage they have learnt from in school (Item 3.1.1). Students could select more than an option, from the following heritage categories: historical, artistic, natural, intangible and industrial. From all the answers garnered, students from both education levels selected the historical heritage as the first option (68.6% in primary education and 84.9% in secondary education), what would explain the results in Item 2.3, where students were able to locate churches and monuments correctly in over 50% of the cases, and in consonant with what it is known and considered heritage in similar contexts (Conde and Armas, 2019).

The natural heritage category is the second that students selected (65.63% in primary education and 70.52% in secondary education), a result that coincides with the heritage conceptions (Item 2.1). Environmental heritage is worked in schools, but as mentioned, without a link to humans and identity (Morón-Monge *et al.* (2012)). Didactic interventions with this approach would facilitate the holistic view and the valorisation of all heritage typologies (Trabajo Rite and Cuenca-López, 2017; Martínez and Fontal, 2020).

Nonetheless, it is also important to state that when focusing on the heritage typologies they learnt the least from, their opinion now differs since primary students selected artistic heritage (21.58%) whilst, secondary education students chose industrial heritage (26.82%). In this respect, it is significant to point out artistic heritage could be considered as historical heritage by some students; thereby, the industrial heritage would be the least worked for both levels and the results would coincide: 27.53% in primary education and 26.82% in secondary education. As already seen, this heritage typology also occupies the last position in conceptions' answer (3.1.1); so that work it more frequently, it would bring it better recognition as it has been demonstrated in recent research (Trabajo-Rite and Cuenca-López, 2020).

In order to discuss specifically if there is a relation between the heritage elements studied by students (Item 3.1.1) and the typologies of heritage they recognize as such (Item 2.1), the following table (Table 5) was created as a result of a correlation analysis of contingency table. In this, focused on both primary and secondary students, the elements "Church" and "archaeological site" are strongly related to historical heritage, confirming this way when a

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				Heritas	ze typologies s	studied				
Elements considered heritage	Historical PE	heritage SE	Artistic l PE	heritage SE	Natural PE	heritage SE	Intangible PE	heritage SE	Industrial P PE	l heritage SE
Church	<0.001*	0.001*	0.492	0.31	0.544	0.727	0.149	0.113	0.023*	0.585
Natural area	<0.001*	0.027*	0.102	0.091	0.125	0.1	<0.001*	0.164	0.332	0.431
Water mill	0.084	0.95	0.556	0.003*	0.618	0.021*	0.117	0.002*	0.228	0.002*
Popular dance	<0.001*	0.049*	0.931	0.005*	0.032*	0.147	0.003*	<0.001*	0.061	0.321
Gorge	0.069	0.647	0.881	0.002*	0.047*	0.762	0.973	0.031*	0.002*	0.054
Archaeological site	0.042*	<0.001*	0.1	0.013*	0.002*	0.332	0.161	*2000	0.148	0.13
Factory	0.052	0.035*	0.673	0.078	0.166	0.226	0.162	0.224	0.138	<0.001*
Mediterranean diet	0.603	0.213	0.083	*900'0	*600.0	0.044*	896.0	0.145	0.016*	0.199
Language	0.047*	0.014*	0.215	0.569	0.029*	0.071	0.081	<0.001*	0.236	0.785
Urban park	0.513	0.887	908.0	0.031*	0.149	0.035*	0.092	0.369	0.026*	0.36
Source(s): Table created by	d by authors									

Table 5.
Correlation analysis of contingency table between the typologies of heritage studied in school and the elements that primary education (PE) and secondary education (SE) students consider heritage

heritage typology is studied in school, this can be linked to heritage concept more easily. In the same way, we can find a strong correlation between the intangible heritage and the "popular dance" or the "Catalan language", on primary students, or the industrial heritage and the element "factory", on secondary students.

3.2.2 Connection between heritage studied and visited as a curriculum topic. After finding interesting correlations between heritage typologies studied in school and the elements that students consider heritage, it makes sense to continue delving in the connection between the same typologies studied (Item 3.1.1) and the heritage elements visited as an academic activity outside the school walls (Item 3.1.2).

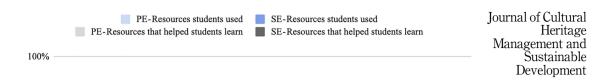
When students were asked if they visited heritage with the school, both primary and secondary education students answered positively (82.31 and 77.98%), what led to an open question related to the heritage elements discovered. After analysing those answers, results showed that the elements most visited were historical houses-museum (52.5%), what also happens in Item 2.3, followed by natural spaces (16%), as well as other heritage elements related to industrial heritage (14.8%), a trend that is like Item 2.1 responses, the one related to what they consider heritage.

Thus, only for primary education students, a significant correlation was spotted between the typologies of heritage studied and visited outside the school. It is especially strong for historical (<0.001) and natural (<0.001) heritage, so that it is interesting, at this point, to analyse how they worked them, with what kind of activities or resources and check if there is any possible relation.

3.2.3 Used and preferred activities or resources to learn from heritage in school. As observable, in Figure 2 (Item 3.1.3), most students from both education levels have enjoyed visits (78.32%, average) and portfolios (67.58%, average) the most. On the other hand, games (29.51%, average) and workshops (41.33%, average) are the activities which students have used the least to learn from heritage in class. According to these results, we can conclude that there is a possible explanation in the relation between the heritage categories most studied, as we have seen those are historical and natural (Item 3.2.1), and the heritage categories most visited outside the school as an academic activity, again historical and natural (Item 3.1.2), because they could have known them through visits.

In the same figure, there are also some differences: while 47.32% of primary education students seem to have learnt from workshops, only 35.35% of secondary students state the same. Furthermore, the variations are also clear on resources such as games: where over 36.45% of primary education students confirmed having learned through them about heritage, but only a 22.56% when looking to secondary education students, a difference of 13.9% points. The perception that workshops and games are better for primary levels, while lectures are more appropriate for secondary courses, where it is used a 9.35% more, seems to still be present among teachers. It would be worth a reconsideration in this regard, given the advantages of active methodologies for a meaningful learning together with digital resources and offer, if it was necessary, training for teaching team (Karantalis *et al.*, 2022).

Moreover, also Figure 2, represents students' responses when asked which of the activities or resources helped them to learn more about heritage (Item 3.1.4). Primary education students were more diversified in their answers, since almost all the resources received between a 20% and a 40% of their support. Nevertheless, activities or resources, such as videos and portfolios, are the ones more supported (38.69 and 37.35% respectively). In this point, it is important to highlight the difference in the "visit" element between the real use and the consideration expressed from primary students, almost 50 points less. We could ask, in this sense, how are these visits or what kind of methodologies are used by heritage technicians or museum educators. They could work as a lecture outside the school, then with a passive role of students where only the guide acts, a tendency seen in many museums (Othman *et al.*, 2021). Other approaches are possible, dynamic practices linked with the classroom activities and the community (Trabajo-Rite and Cuenca-López, 2020).



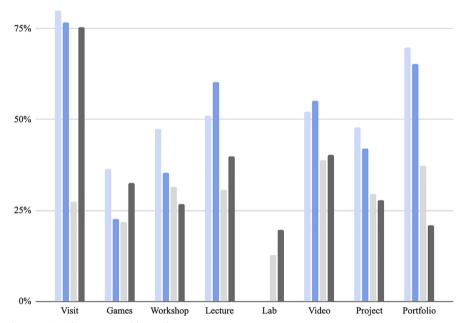


Figure 2.
Primary education (PE)
and secondary
education (SE)
students' answers on
which educative
activity or resource
they have used to learn
from heritage in class
and students' answers
on which educative
activities or resources
help them to learn more
about heritage

**Source(s):** Figure created by authors

On the other hand, when looking at responses provided by secondary education students, there is one resource that seems to impact more those students when talking about heritage, tours or visits, which received over a 75% of support. Moreover, the other resources that seem to impact the most on these students are lectures and videos (39.79 and 40.32% respectively). In this case visits are appreciated by students, who could enjoy going outside schools, in spite the didactic activity is not active.

Finally, it is also important to highlight that labs have never been used at neither of the two education levels, nevertheless they received almost 20 percentage points in both. In this case, their response could have been guided by their experience at experimental science labs. Social science or interdisciplinary labs are also possible, and they provide a more active role for students and greater motivation (Corrales *et al.*, 2019).

3.2.4 Discovering heritage as an extracurricular topic. Students were asked if they had ever visited different heritage elements outside school hours (Item 3.2.1). Both, primary and secondary education students answered positively in that question (87.8 and 63.41%, respectively), although the difference between levels is significant (24 percentage points). One might ask whether this difference could be linked with a greater autonomy of teenagers, who manage their leisure time without parents' control and disinterest to visit heritage in this time.

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Moreover, if the question related to visiting heritage elements outside school hours was answered with a "yes", students were also asked to specify the heritage elements they remember visiting, as in Item 3.1.2. After analysing the data, results show that most open answers refers to historical-artistic heritage (67%), basically museums and churches, as well as natural heritage (29%) and intangible heritage (1%), coinciding with heritage as the most studied in classrooms (Item 3.1.1) and more visited outside the school as an academic activity (Item 3.1.2). Thus, this tendency shows which heritage typologies are predominant in school and even in social and family contexts, which finally refers to different heritage categories and shows the importance of seeing heritage holistically even outside the school doors (Caeiro-Rodríguez, 2022).

On the other hand, the responses regarding how students discover heritage in their spare time, either with their families or when attending non-formal education activities such as summer camps (Item 3.2.2) are displayed in Figure 3. As observable, the most chosen categories related to tours, the activity most used in school, so that, again, a tendency could uphold and affirm that this is the principal methodology for any educational context, formal and non-formal, in which heritage is studied. However, there is a significant difference between both education levels because non-guided and guided tours got more support by secondary education students (58.26 and 40.85%, respectively), whilst in primary education, non-guided tours and guided tours got less support (22.47 and 26.19%, respectively). This, again, can be related to free time management, because secondary education students can decide what to do with most of their spare time. Moreover, at this point it is interesting to highlight the preference of secondary students for non-guided tours, with more than ten points difference with the guided ones, because it could be linked to the way guided visits are done, as mentioned, to the role of the visitor or student.

Also in Figure 3, it is observable that other resources used by students to discover heritage in their spare time have very similar results in primary and secondary education, such as workshops and games (18.75 and 20.96%), as well as virtual tours (12.35 and 11.01%, respectively) and contests (7.29 and 9.77%, respectively). What is more, it is worth noting the

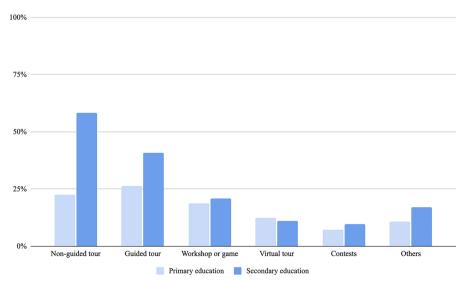


Figure 3.
Primary and secondary education students' answers on how they have got to know heritage outside school hours

**Source(s):** Figure created by authors

low punctuation of virtual tours, in a moment when a global pandemic had just ended Journal of Cultural (COVID-19). In this sense, one might wonder if this kind of experiences exist to a large degree, have a didactic focus or are known among children and young students.

Furthermore, students were asked if they collaborate or had collaborated with an association connected with the heritage (Item 3.2.3) in order to study if those students had a greater knowledge of this, and consequently if they are more sensibilized towards it. In primary and secondary education, the results were very alike, just a 5.36% and a 5.86% of students responded positively. From those, only 20 students (which represent approximately a 1% of the total sample) answered that question with a real example of an association in which they were linked to, what it makes impossible a generalization among students.

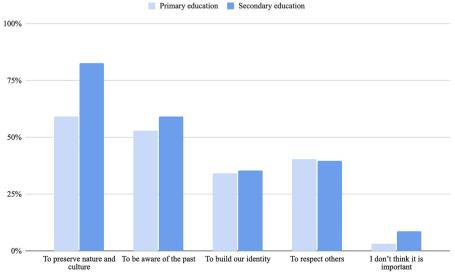
In this sense, the need of implementing and assessing educative programs that work towards students' awareness and active participation with relation to their local heritage becomes undeniable (Castro-Calviño et al., 2021).

## 3.3 The importance of heritage and its safeguard

The importance of heritage perception has been measured using the last two items from the questionnaire, where students from primary and secondary education answered questions regarding how they value it and consider its safeguard.

In Figure 4 it is easy to see how primary and secondary students perceive the importance of knowing heritage (Item 4.1). The most voted reason is to preserve nature and culture: however, it seems much more important for secondary education students (82%) than for primary education students (59%), with over 20 percentage points of difference.

Furthermore, also Figure 4 represents other reasons that were considered to be influential for primary and secondary education students, such as historic memory (52 and 59%, respectively), identity construction (34 and 35%, respectively), as well as values such as respect (40 and 39%, respectively). These are significant when considering how abstract the concepts of identity and respect are, even more for primary education students that range



Source(s): Figure created by authors

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Figure 4. The importance of discovering and knowing heritage according to students' perception

from 9 to 11 years. Withal, identifying with your own heritage is crucial to preservation and respect, as highlighted by Fontal *et al.* (2017), it is the last and most advanced step in the heritage process chain.

It is also relevant to state that a very small number of students, 3% in primary education and less than a 9% in secondary education, did not consider heritage education was essential or relatable to the categories mentioned. In this sense, it is safe to consider that most students have been impacted positively by their didactic experience on heritage education, explained previously, according to Donmez and Yesilbursa (2014), experimental heritage education activities impact positively on students' attitudes towards heritage. Moreover, it is important to state that students from both education levels value heritage, as seen in Figure 4, which strengthens their awareness of local identity, as well as boosts the sense of belonging to a community and enriches the collective identity (Pinto, 2015).

Furthermore, results from the effects that students think that heritage loss may cause can be found in Figure 5 (Item 4.2). There, it is observable how students from secondary education seem slightly more aware of the effects that the destruction of heritage may have in the long run, such as a negative effect on cultural and natural spaces that define us (65.72%), as well as jeopardizing learning from the past (64%). On the other side, primary education students perceived the heritage loss effects more related to jeopardizing learnings from the past (39.14%) and to environmental problems (26.04%).

Regarding those answers, it seems logical to relate natural heritage loss to environmental issues but, it is also important to spotlight the impact that climate change has on other levels as cultural heritage, and the important role of heritage education plays in this sense, since it is rooted in its continuous preservation and valorisation (Hambrecht and Rockman, 2017).

As shown in the results, different motivations were highlighted when asking students with regard to heritage loss. In this sense, it is essential to consider that the loss of heritage should not only be linked to a specific event or consequence, and students from Andorra perceive the relevance of such problems and relate them to various causes, as shown in Figure 5. In this sense, and as foregrounded by Harrison and Rose (2010), conservation of

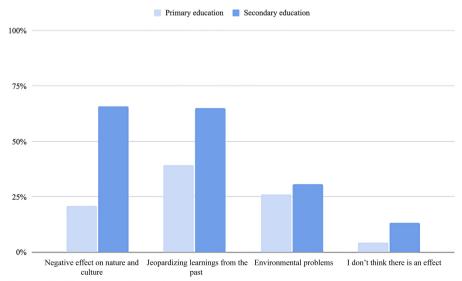


Figure 5.
Possible effects from heritage loss according to students' perception

**Source(s):** Figure created by authors

heritage must be bordered on together with different relevant issues such as environmental Journal of Cultural challenges, social wellbeing, welfare, among other current events.

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#### 4. Conclusion

This research has allowed to deeply analyse heritage conceptions and perceptions as well as the learning context of heritage education in a particular country, Andorra. It is a pioneering study because of the methodology and the combination of instruments that have been designed specifically, as well as the high number of participants that took part. Moreover, this research considered the education community (students and teachers) but also heritage managers, what makes it the first investigation in which the theme of heritage education is studied for formal and non-formal spheres throughout an entire country, and consequently allows us to have a broad vision of the degree of importance that society grants to heritage. This study has the great potential of having been able to identify past and present trends, which will allow creating future studies that may focus on teacher's practice and students development related to heritage, as well as, on public policies in charge of heritage education regulation. It also allows sharing the good practices collected, promoting them and suggesting improvements in terms of methodologies, resources and curriculum. Given the vast number of data collected, this article just focuses on the students, but in future publications, the results related to teachers and heritage managers are expected to be analysed.

With regard to the first objective of the study, related to students' conceptions of heritage, it can be concluded that around half of the students have a holistic view of heritage, although secondary education students in a slightly broader way. Otherwise, primary education students seem to have a greater knowledge of local heritage, whilst secondary students brought into focus international heritage slightly more.

In relation to the second main objective, connected to the didactic experience and learning context of heritage education, two heritage categories were the most voted in school hours and in the students' spare time, those were historical and natural heritage. Moreover, tours are the most used resources to study heritage and, also, the ones that help students the most, as seen in secondary education students.

For the last objective, the research aimed to measure students' perceptions on the importance of heritage and its safeguard. Here, answers were conclusive, since over 90% of students believe it is important to safeguard heritage because it is connected to nature and culture preservation. In this sense, students also agree on the negative effect heritage loss may cause.

Furthermore, it is indispensable to highlight which limitations have impacted this project, as well as which future lines of research those open. Closed questions have not allowed to study in more detail some interesting aspects but, this is expected to be solved with the data gathered from the interviews to teachers from all education systems and heritage managers done in the same project, and they can be shared in future publications.

Finally, it is also important to highlight that, being a pioneer study, another important limitation has been not having previous investigations with a similar objective for an entire region or country. Thus, it has also opened an appealing line of research, becoming a model for future broad studies regarding heritage education in other regions or specific mountain areas.

#### References

Barghi, R., Zakaria, Z., Hamzah, A. and Hashim, N.H. (2017), "Heritage education in the primary school standard curriculum of Malaysia", *Teaching and Teacher Education*, Vol. 61, pp. 124-131, doi: 10.1016/j.tate.2016.10.012.

- Barrett, M. (2020), "The Council of Europe's reference framework of competences for democratic culture: policy context, content and impact", *London Review of Education*, Vol. 18 No. 1, pp. 1-17, doi: 10.18546/lre.18.1.01.
- Caeiro-Rodríguez, M. (2022), "La familia como mediadora artística en la educación patrimonial: Aprendizajes familiares intergeneracionales en patrimonio cultural, artístico y natural", Encuentros: Revista de Ciencias Humanas, Teoría Social y Pensamiento Crítico, Vol. 15, pp. 163-178.
- Carrera, X., Vaquero, E. and Balsells, M.A. (2011), "Instruments for assessing digital competencies of at-risk adolescents", Edutec: Revista Electrónica de Tecnología Educativa, Vol. 35, pp. 1-25.
- Casanova, E., Arias Ferrer, L. and Egea Vivancos, A. (2018), "La metodología por proyectos como oportunidad para la introducción de la historia y el patrimonio en las aulas de Educación Infantil", Contextos Educativos, No. 22, pp. 79-95, doi: 10.18172/con.3185.
- Castro-Calviño, L., Rodríguez-Medina, J. and López-Facal, R. (2021), "Educación patrimonial para una ciudadanía participativa. Evaluación de resultados de aprendizaje del alumnado en el programa Patrimonializarte", Revista Electrónica Interuniversitaria de Formación del Profesorado, Vol. 24 No. 1, pp. 205-219, doi: 10.6018/reifop.444881.
- Conde, J. and Armas, X. (2019), "Representaciones sociales del alumnado de educacion primaria sobre el patrimonio. Estudio por medio de la asociacion de palabras", Revista Interuniversitaria de Formacion del Profesorado. Continuacion de la Antigua Revista de Escuelas Normales, Vol. 33 No. 2, doi: 10.47553/rifop.v33i2.73266.
- Corrales, M., Díaz Rincón, B., Sánchez Martín, J. and Moreno Losada, J. (2019), "El laboratorio de Humanidades y Ciencias Sociales en Educación Secundaria: planteamiento teórico y análisis de posibilidades prácticas", *Papeles salmantinos de educación*, Vol. 23, pp. 129-151, doi: 10.36576/ summa.108390.
- Council of Europe (2019), "The Faro Convention role in a changing society: building on a decade of advancement", available at: https://rm.coe.int/the-faro-convention-s-role-in-a-changing-society-building-on-a-decade-/1680a53b97 (accessed 15 January 2023).
- Creswell, J.W. (2014), Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 4th ed., Sage Publications, available at: https://fe.unj.ac.id/wp-content/uploads/2019/08/Research-Design\_Qualitative-Quantitative-and-Mixed-Methods-Approaches.pdf (accessed 22 January 2023).
- Cuenca, J.M. (2004), Heritage in Social Studies Education: Conceptions and Obstacles to Integrate its in Teaching and Learning Compulsory Education, UMI- ProQuest, MI.
- Cuenca, J.M. and Pérez, M. (2021), "El cuento en la enseñanza del patrimonio: Análisis de propuestas didácticas en Educación Infantil", REIDICS. Revista de Investigación en Didáctica de las Ciencias Sociales, Vol. 8 No. 8, pp. 243-265, doi: 10.17398/2531-0968.08.243.
- Department of Statistics, Government of Andorra (2022), available at: https://www.estadistica.ad/ portal/apps/sites/#/estadistica-en (accessed 10 January 2023).
- Donmez, C. and Yesilbursa, C.C. (2014), "The effect of cultural heritage education on students' attitudes toward tangible heritage", *Elementary Education Online*, Vol. 13 No. 2, pp. 425-442.
- Estepa, J., Ruiz, R.M.Á. and Listán, M.F. (2008), "Primary and secondary teachers' conceptions about heritage and heritage education: a comparative analysis", *Teaching and Teacher Education*, Vol. 24 No. 8, pp. 2095-2107, doi: 10.1016/j.tate.2008.02.017.
- Estepa-Giménez, J. and Martín, M. (2020), "Heritage in conflict: a way to educate in a critical and participative citizenship", in *Handbook of Research on Citizenship and Heritage Education*, Information Science Reference, pp. 43-55.
- Fontal, O. (2003), La educación patrimonial. Teoría y práctica en el aula, el museo e internet, Trea, Gijón.
- Fontal, O. (2016a), "The Spanish heritage education observatory", Culture and Education, Vol. 28 No. 1, pp. 254-266, doi: 10.1080/11356405.2015.1110374.

- Fontal, O. (2016b), "Educación patrimonial: retrospectiva y prospectivas para la próxima década", Journal of Cultural Estudios Pedagógicos, Vol. 42 No. 2, pp. 415-436, doi: 10.4067/s0718-07052016000200024. Heritage
- Fontal, O. and Ibáñez- Etxeberria, A. (2015), "Estrategias e instrumentos para la educación patrimonial en España", Educatio siglo XXI: Revista de la Facultad de Educación, Vol. 33 No. 1, pp. 15-32, doi: 10.6018/j/222481.
- Fontal, O., Ibáñez-Etxeberria, A., Martínez Rodríguez, M. and Rivero García, P. (2017), "El patrimonio como contenido en la etapa de Primaria: del currículum a la formación de maestros", Revista Electrónica Interuniversitaria de Formación del Profesorado, Vol. 20 No. 2, pp. 79-95, doi: 10. 6018/reifop/20.2.286321.
- Govern d'Andorra (2021), *Llibre Blanc de la Cultura*, available at: https://www.cultura.ad/images/stories/LlibreBlanc/Llibre Blanc Cultura.pdf (accessed 20 November 2023).
- Hambrecht, G. and Rockman, M. (2017), "International approaches to climate change and cultural heritage", American Antiquity, Vol. 82 No. 4, pp. 627-641, doi: 10.1017/aaq.2017.30.
- Harrison, R. and Rose, D. (2010), "Intangible heritage", in Benton, T. (Ed.), Understanding Heritage and Memory, Manchester University Press in association with The Open University, Manchester, UK, pp. 238-276.
- Jagielska-Burduk, A. and Stec, P. (2019), "Council of Europe cultural heritage and education policy: preserving identity and searching for a common core?", Revista Electrónica Interuniversitaria de Formación del Profesorado, Vol. 22 No. 1, pp. 1-12.
- Jiménez, R., Cuenca, J.M. and Ferreras, D.M. (2010), "Heritage education: exploring the conceptions of teachers and administrators from the perspective of experimental and social science teaching", *Teaching and Teacher Education*, Vol. 26 No. 6, pp. 1319-1331, ISSN 0742-051X doi: 10.1016/j. tate.2010.01.005.
- Karantalis, N., Koukopoulos, D. and Koutromanos, G. (2022), "Digital narrative as an educational tool for cultural heritage teaching", *The Digital Folklore of Cyberculture and Digital Humanities*, Vol. 7, pp. 117-141, doi: 10.4018/978-1-6684-4461-0.ch007.
- Koch, E. and Gillespie, J. (2022), "Separating natural and cultural heritage: an outdated approach?", Australian Geographer, Vol. 53 No. 2, pp. 167-181, doi: 10.1080/00049182.2022.2069480.
- López-Fernández, J.A., Medina, S., López, M.J. and García-Morís, R. (2021), "Perceptions of heritage among students of early childhood and primary education", Sustainability, Vol. 13 No. 19, p. 10636, doi: 10.3390/su131910636.
- Marín-Cepeda, S. and Fontal, O. (2020), "Percepciones de estudiantes de Educación Secundaria Obligatoria en torno al Patrimonio", *Arte, Individuo y Sociedad*, Vol. 32 No. 4, p. 917.
- Martínez, M. and Fontal, O. (2020), "Dealing with heritage as curricular content in Spain's Primary Education", *The Curriculum Journal*, Vol. 31 No. 1, March 2020, pp. 77-96.
- Ministerio de Derechos Sociales y Agenda 2030 (2021), "Sustainable development strategy 2030", available at: https://www.mdsocialesa2030.gob.es/agenda2030/documentos/eds-eng-acce.pdf (accessed 17 January 2023).
- Miranda, M.F. (2021), "Património Escolar do Ensino Primário (PEEP) e coleções nos museus do norte de Portugal", in Homem, P.M., Andrez, B., Soares, G. and Amaral, L. (Eds), Ensaios e Práticas em Museologia, FLUP/DCTP/MMUS, Porto, Vol. 2, pp. 108-130, doi: 10.21747/978-989-9082-06-9/ 102021a7.
- Morón-Monge, H., Morón, M.C., Wamba, A. and Estepa-Giménez, J. (2012), "Environmental and Heritage Education as a tool for the sustainable development: an analysis on experimental science and social science textbooks in Secondary School", *Paper presented at the 3rd International Conference on Heritage and Sustainable Development*, 19-22 June 2012, doi: 10. 13140/2.1.4714.8805.
- Morote, A.F. and Colomer, J.C. (2021), "Analysis of the activities based on ICT resources in Social Science textbooks (primary education): an approach to social-environmental issues", *Publicaciones de la Facultad de Educación y Humanidades del Campus de Melilla*, Vol. 51, pp. 87-137.

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Development

- Ortega-Sánchez, D. and Gómez-Trigueros, I.M. (2019), "Didactics of historical-cultural heritage QR codes and the TPACK model: an analytic revision of three classroom experiences in Spanish higher education contexts", Education Sciences, Vol. 9 No. 2, p. 117, doi: 10.3390/educsci9020117.
- Othman, M.K., Aman, S., Anuar, N.N. and Ahmad, I. (2021), "Improving children's cultural heritage experience using game-based learning at a living museum", *Journal on Computing and Cultural Heritage*, Vol. 14 No. 3, pp. 39-24, doi: 10.1145/3453073.
- Piccardo, E., Antony-Newman, M., Schmor, R., Lawrence, G., Galante, A., Germain-Rutherford, A. and Scholze, A. (2022), "All things interconnected: activating holistic, dynamic and diverse perspectives in the enactment of innovative language education. Activating linguistic and cultural diversity in the language classroom", *Educational Linguistics*, Vol. 55, pp. 285-306, doi: 10.1007/978-3-030-87124-6\_11.
- Pinto, H. (2015), "Educação patrimonial e educação histórica: contributos para um diálogo interidentitário na construção de significado sobre o passado", *Diálogos*, Vol. 19 No. 1, pp. 199-220, doi: 10.4025/dialogos.v19i1.1049.
- Pinto, H. and Zarbato, J. (2017), "Constructing a significant learning through local heritage: practicing Heritage Education in Portugal and Brazil", *Estudios Pedagógicos*, Vol. 43 No. 4, pp. 203-227, doi: 10.4067/s0718-07052017000400011.
- Santacana, J., Martínez, T., Llonch, N. and López, V. (2016), "¿Qué opinan los adolescentes sobre los museos y la didáctica?", Didáctica de las Ciencias Experimentales y Sociales, Vol. 31 No. 2, pp. 23-38.
- Trabajo Rite, M. and Cuenca López, J.M. (2017), "Heritage education for the acquisition of emotional and territorial competences of the secondary students", *Pulso: Revista de educación*, Vol. 4 No. 40, pp. 159-174, doi: 10.58265/pulso.5118.
- Trabajo-Rite, M. and Cuenca-López, J.M. (2020), "Student concepts after a didactic experiment in heritage education", Sustainability, Vol. 12 No. 7, p. 3046, doi: 10.3390/su12073046.
- Yáñez, C. and Gómez-Trigueros, I.M. (2022), "Challenges with complex situations in the teaching and learning of social sciences in initial teacher education", Social Sciences, Vol. 11 No. 7, p. 295, doi: 10.3390/socsci11070295.
- Zagato, L. (2015), "The notion of heritage community in the Council of Europe's Faro convention. Its impact on the European legal framework", in *Between Imagined Communities of Practice:* Participation, Territory and the Making of Heritage, Göttingen University Press, available at: https://books.openedition.org/gup/220 (accessed 23 January 2023).

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