

Educational challenges in the Portuguese UNESCO Global Geoparks: contributing for the implementation of the SDG 4

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Abstract: With the approval in 2015 of the Agenda 2030 for Sustainable Development, and with the adoption by UNESCO of the new International Geoscience and Geoparks Program (IGGP), the UNESCO Global Geoparks (UGGp) became an important UNESCO designation with the responsibility to fulfil the main principals and strategy of the Organization. By developing the four pillars of UNESCO: Education, Science, Culture and Communication and developing the UGGp activities in the framework of the referred Agenda and its 17 Sustainable Development Goals (SDGs), especial attention has been given to education. In fact, the definition of UGGp recognises the importance of education as a vital engine to promote a transformative change, lifelong learning opportunities for all and to foster quality inclusive education as expressed by SDG 4 “Quality Education”. The Portuguese UGGp in their own educational offer and in their joint educational activities, based in the targets of SDG 4, developed a set of several educational packages, along with the partnership based in the Educational Program “GEA – Mother Earth”. This aimed to involve school and local communities in a global vision that education is a key to the global integrated framework of the SDGs and plays a central role in a changing world. By demonstrating the educational challenges faced by the Portuguese UGGp in the field of education and their contribution for SDG 4, this paper can be considered an essay about the role of UGGp in this field. It seeks also to find some answers to some of the concerns raised nowadays: what

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type of education is required in the 21st century? How can UGGp through their educational offer contribute to adapt ourselves to change and to transform the world within which we live in? Can UGGp also contribute to the different dimensions of Sustainable Development through their educational programs and projects? These are some of the issues raised and inspired in the targets of SDG 4 that the UGGp seek to contribute through their educational initiatives.

Keywords: UNESCO Global Geoparks, Educational Programs, SDG 4, Portugal

1 Introduction

On October 2015 the General Assembly of the United Nations adopted the Resolution A/RES/70/1 Transforming our world: the 2030 Agenda for Sustainable Development, following the Declaration of Heads of State and Government and High Representatives, that decided 17 new Sustainable Development Goals (SDGs). One month later, the 195 Member States of UNESCO ratified the creation of a new label, the UNESCO Global Geoparks (UGGp), during the 38th General Conference of the Organisation.

Why are these two decisions so important to achieve Education for all? What do they have in common? What are the links between them and how can they improve education for all? What are the education challenges faced by the UGGp? How can UGGp contribute for the implementation of the SDGs of the Agenda 2030, in the field of education?

In this framework, one needs to rewind to 2015, when UNESCO published the Education for all Global Monitoring Report, stating that until this year it was not yet possible to reach education for all, although there was an accelerated progress, notably in getting millions of children and youth into school and reducing gender disparities (UNESCO, 2015a). This report was very useful to rethink education and to lead to the Sustainable Development Goal (SDG) 4 – “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” through the targets proposed for this particularly SDG of the Agenda for Sustainable Development (2015-2030). In fact, Education for Sustainable Development (ESD) is placed at the centre of this Agenda, and it is understood as a mean to “empower learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity” (UNESCO, 2018a). This means that ESD promotes holistic and transformational education. That is why ESD is recognized as key enabler of sustainable development and integral element of quality education (UNESCO, 2015b).

In this context, it is interesting to see the links between SDG 4 and the work developed by the UGGp. In these UNESCO territories it is given a great emphasis to the development of educational programs, aiming to preserve geological heritage for present and future generations, educating and teaching the public at general about themes related with Earth Sciences and their relations with environmental issues, ensuring sustainable development at the social, economic and cultural levels (Zouros et al., 2005).

2 UNESCO Global Geoparks and education

Accordingly, to the UNESCO definition, the UGGp “are single, unified geographical

areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development” (UNESCO, 2016). At present, there are 140 UGGp in 38 countries and all of them develop activities around ten focus areas:

- Natural Resources
- Geological Hazards
- Climate Change
- Education
- Science
- Culture
- Women
- Sustainable Development
- Local and Indigenous Knowledge
- Geoconservation

Regarding the topic education, it is stated by the International Geoscience and Geoparks Program (IGGP) that it is a “pre-requisite that all UGGp develop and operate educational activities for all ages to spread awareness of the geological heritage and its links to other aspects of our natural, cultural and intangible heritages” (UNESCO, 2016). Therefore, UGGp should offer educational programs for schools or offer special activities for children. They should also offer education, both formal and informal, for adults and retired people while many provide training for local people who can then, in turn, teach others. In this framework, a link is made to the Agenda 2030 and its SDG 4, regarding target 4.7 (United Nations, 2015):

“By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development”.

But how can the UGGp introduce in their local communities this universal goal and contribute to the mentioned target? What kind of education can be offered by the teachers and educators in coordination with the technical staff of the UGGp? Which tools can be used and developed to really contribute for an effective education, regarding the challenges of the ESD?

Being UNESCO the specialized United Nations agency for education, in 2015 this Organization published a very pertinent publication entitled “Rethinking Education – Towards a global common good?”, which stated that education is a key to the global integrated framework of SDGs. It assumes that the world is changing, so education must also change (UNESCO, 2015b). In fact, to have a better understanding about the world that surrounds us, based in an information in context and bearing in mind that the Earth is in permanent and accelerated transformation, “this calls for new forms of education to foster the competencies that societies and economies need, today and tomorrow” (UNESCO, 2015b). In this sense, education must be about learning to live on a Planet under pressure, it must be about cultural literacy, on the basis of respect and equal dignity, helping to weave together the social, economic and environmental dimensions of Sustainable Development (UNESCO, 2015b). In this context, the UGGp have a commitment in order to plan their educational activities based in this reality,

trying to reach the school communities through creative and innovative education proposals, using the existing geological heritage of the territory, based on training courses and pedagogical tools for teachers, educators and students. This will help them to understand the story of planet Earth and the importance of the sustainable use of the natural resources, aiming to contribute to a change of behaviours and attitudes that can lead to healthy lifestyles and respect for our world.

Bearing this in mind, the UGGp plan their educational programs not only according to the school curriculum goals, but also considering the large values of geodiversity, of biodiversity and cultural (tangible and intangible) existing in these territories. In this sense, each geosite assumes itself as a “page” of a big book – the storytelling of planet Earth. So, the natural and cultural heritage of these territories can be seen as “living laboratories” for all ages, acting as educational manuals, for a significant understanding about the dynamic of planet Earth and how to mitigate the pressure caused by our lifestyles and way of living. Therefore, UGGp focus their educational programs and activities on quality education, widening the angle of it and using infrastructures and innovative facilities that already exists or are created by the UGGp management structures, sometimes in partnership with other entities providing, for example, new access to geosites (innovative pathways) and new pedagogical and educational materials to explain them during field trips. This can be complemented by diverse outdoor activities, talks, lectures, courses, workshops, story books, school contests and/or photograph competitions, among others. In this framework, this reality is usually included in educational projects involving the UGGp technical staff and the school communities, offering each school year a new or renewed school activities, always taking into account the UGGp philosophy and the reality of each territory

3 Portuguese UGGp and their educational activities

Nowadays there are four Portuguese UGGp: Naturtejo da Meseta Meridional, Arouca, Azores and Terras de Cavaleiros. In all these territories, the concept of UGGp has been seen as a very positive tool for sustainable regional development, especially in rural areas, aiming to revitalize their local communities and their local economies, attracting tourists, through geotourism, and offering new living opportunities in order to avoid the depopulation of these territories.

The oldest Portuguese UGGp is Naturtejo da Meseta Meridional, which integrates the international networks of geoparks since 2006. It is located in the Centre Region of Portugal, between Beira Baixa and Alentejo provinces, on the eastern border with Spain. The territory includes seven municipalities: Castelo Branco, Idanha-a-Nova, Nisa, Oleiros, Proença-a-Nova, Vila Velha de Ródão and Penamacor.

Later, in 2009, was Arouca UGGp to be accepted by the European and Global Geoparks Networks (EGN /GGN). The territorial borders are coincident with the Municipality of Arouca, belonging to Aveiro District but within the broader Porto Metropolitan Area.

The third one is the Azores UGGp, integrating the nine islands, the islets and the surrounding seafloor of this Atlantic archipelago, under the motto “nine islands, one geopark”, became member of the international networks of geoparks in 2013.

The fourth and most recent is Terras de Cavaleiros UGGp, which was accepted as member of the EGN /GGN in 2014. It comprises the borders of the Municipality of

Macedo de Cavaleiros and it is located in the Bragança District (NE Portugal).

Besides these UGGp there are also aspiring territories wishing to become UGGp, in Portugal. In November 2017, the Aspiring Estrela Geopark application dossier was delivered to the Secretariat of the IGGP and is now waiting for the final decision regarding the application process. Other Portuguese territories are trying to improve their work accordingly to the UGGp guidelines and commitments, acting already as aspiring UGGp.

All the four Portuguese UGGp develop especial educational activities and each school year they offer their own educational packages and programs aligned with the Educational Programs of the Portuguese Education Ministry and also lined up with the Education focus area of the IGGP/ UGGp.

In April 2011, the Portuguese National Commission for UNESCO (NatCom) created under its coordination the Portuguese Forum for UGGp. This coordination is led by the Science Sector of the Portuguese NatCom for UNESCO and aims mainly to act as a platform to increase knowledge among its members, encouraging the share of knowledge and experiences and defining common strategies and methods for joint activities (Silva *et al.*, 2015a). In this sense, in the field of education, the Portuguese Forum of UGGp coordinates joint educational initiatives between the Portuguese UGGp and involves the new aspiring UGGp in this process. Some of these initiatives involve also the UNESCO Associated Schools Project Network (ASPnet), UNESCO Clubs and UNESCO Chairs, such as the UNESCO Chair on Geoparks, Regional Sustainable Development and Healthy Lifestyles, hosted by the University of Trás-os-Montes e Alto Douro (UTAD).

In this framework, since 2006 the Portuguese UGGp developed a diverse set of educational programs (Silva *et al.*, 2010; Paz *et al.*, 2010; Catana *et al.*, 2011; Henriques *et al.*, 2012; Lima & Garcia, 2012). These educational programs were initially focused on the knowledge and comprehension of the geological heritage of these territories. For its implementation, these educational programs used since the beginning the territorial infrastructures, like the pedestrian trails networks (Rocha *et al.*, 2006; Catana, 2008a), the interpretative centers (Catana, 2008a; Rocha *et al.*, 2008, 2009; Figueiredo & Sá, 2009), the fossil outcrops (Catana, 2008b; Sá *et al.*, 2009; 2010) or the old mining areas, among others. Posteriorly, with the increasing demand for this educational offer by schools, at a national level and even from Spain, the management structures of the Portuguese UGGp decided to diversify the educational offer. This new reality included itinerant exhibitions and school contests. The last ones, have allowed the development of initiatives (e.g., the patronage of a geosite by an entire class) that facilitate greater knowledge about the territory and the development of a territorial "sense of ownership". At the same time, this approach allowed the increase of partnerships and networking between the Portuguese UGGp and contributing for a different strategy regarding the delivery of the annual awards. In fact, the competitions developed in each territory, based their awards in sponsoring visits of students and teachers to other Portuguese UGGp, promoting this way new friendships and knowledge about other different territorial realities (Silva *et al.*, 2011; 2012; 2013a; 2013b; 2015a). This new strategy brought into the light the importance of the Portuguese UGGp as territories of excellence for education, which led to frequent references of these territories and their natural and cultural heritage in school manuals of several disciplines (Geology, Biology, Portuguese, Social Studies, among others) and

even in some Geology questions of the national exams of high school. Currently, the educational programs offered by the four Portuguese UGGPs are often part of the school activities of a large number of schools outside these UNESCO territories. In the case of Naturtejo UGGp and Arouca UGGp, the number of students visiting these territories to develop formal, non-formal and informal educational activities overpasses 5,000 students/year, in both cases.

In an attempt to deepen the networking between the Portuguese UGGp and also to reinforce the cooperation between the Portuguese Forum of UGGp and the National Committee for the International Geoscience Program (IGCP), the Educational Program "GEA –Mother Earth" was developed and implemented in these territories. This has been a success and has proven to be a very useful tool for achieving some of the SDG4 targets.

4 The Educational Program “GEA – Mother Earth”: a tool for strengthening cooperation among UGGp

Always based in the ESD principles, the educational joint activities launched by the Portuguese Forum for UGGp, since 2011, aim to reach not only the schools of these UNESCO territories but also schools at a national and international level and all learning settings, from public to private schools, involving kindergarten, primary and secondary schools.

The most emblematic activity in this framework was developed by the Portuguese National Committee for the International Geoscience Programme (IGCP), in partnership with the Portuguese Natcom and the Portuguese Forum for UGGp: the Educational Program “GEA-Mother Earth”. This Program ensures a holistic and interdisciplinary approach in educating for sustainability, focusing every year a different theme such as water, geodiversity, biodiversity, natural disasters, Agenda 2030 for Sustainable Development and its 17 SDGs, UGGp, among others (Silva et al., 2013c; 2014; 2015b; 2015c). Aligned also with the mission of the UNESCO Associated Schools (ASPnet), this program is composed by a school contest, an intensive training course for teachers and an itinerary exhibition about the Portuguese UGGp. This is developed also in parallel with another educational project, entitled “The Chemistry between us”, sponsored by BAYER –Portugal as private partner.

Like in the projects developed by the ASPnet schools, the teachers and students involved in “GEA - Mother Earth” are encouraged to develop projects so that children and young people can gain a sound knowledge base, practical skills and competencies as well as new values, attitudes and behaviour that will improve their lifestyles, their environment and their future (UNESCO, 2009).

Teachers are also a target, as they are the privileged key actors in the implementation of an effective ESD. As stressed by UNESCO, teachers are “real agents of change who are so badly needed if sustainable development is to become a reality rather than a mere aspiration” (UNESCO, 2009). Taking into account this important reality, “GEA – Mother Earth” has conducted several training courses and workshops especially dedicated to teachers at all levels and from different disciplines, all around the Portuguese UGGp and aspiring UGGp territories and also among Portuguese Biosphere Reserves territories.

This Educational Program has also been expanded at an international level, and has

been implemented in Cape Verde, through the Cape Verde NatCom for UNESCO, in the Biosphere Reserve in Prince Island, in S. Tomé and Príncipe and also in Araripe UGGp, in Brazil. Since 2012, more than 80.000 students as well as 2000 teachers from more than 200 schools were involved in this educational program (Silva *et al.*, 2015), which aims to integrate ESD in classroom learning as well as in out-of-school and extracurricular activities, since every edition promotes also field trips and the exchange of students between schools of the Portuguese UGGp.

5 Portuguese UGGp: contributes for the SDG 4

The Portuguese UGGp have been developing their activities in the framework of the main lines and priorities of UNESCO, regarding the four pillars on which this Organization develops its strategy: education, science, culture and communication. Nevertheless, recognising that UGGp are mainly territories of science, the work done among the local communities and focusing in the bottom-up approach, education is the key to promote and consolidate the definition of these territories. Thus, belonging to the UNESCO family, UGGp follow also the key reference documents regarding Education and especially the SDG 4 “Quality Education” and its main targets. The “Incheon Declaration Education 2030” (UNESCO, 2015c), is one of those documents, since it expresses the collective commitment of the global education community to an ambitious education goal within the SDG framework. In the Incheon Declaration it is mentioned a new vision for education:

Our vision is to transform lives through education, recognising the important role of education as main driver of development and in achieving the other proposed SDGs. We commit with a sense of urgency to a single, renewed education agenda that is holistic, ambitious and aspirational, leaving no one behind. This new vision is fully captured by the proposed SDG 4 “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” and its corresponding targets.

This Declaration entrusted UNESCO as the United Nations specialised agency for education, to continue its mandate role to lead and coordinate the 2030 Education Agenda convening global, regional and national stakeholders to guide the implementation of the agenda and functioning as a focal point for education within the overall SDG coordination architecture (Incheon Declaration, 2015). In this sense, UGGp are also vital key actors to assist and support UNESCO in this important task. Through their one educational programs and tools, UGGp are also strong partners to achieve SDG 4 and to assist UNESCO in this field. In this context, one can say that all the UGGp are obliged to follow the UNESCO commitment, which as stated by UNESCO (2015c) “ensure that all children, young people and adults gain the knowledge and skills they need to live in dignity, to fulfil their potential and contribute to their societies as responsible global citizens”. This makes clear that “education, a fundamental human right, is the key to global peace and sustainable development” (UNESCO, 2015c).

So, after the adoption of the Agenda 2030 for Sustainable Development, it was understood by the UGGp that education could serve as a catalyst for the overall Agenda 2030 and contribute especially to SDG 4 and its target 4.7:

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sus-

tainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

It is assumed this way that UGGp actively educate their local communities and their visitors of all ages. In this sense, UGGp functioning like outdoor classrooms and incubators for sustainable lifestyles, appreciation of cultural diversity and the promotion of peace (UNESCO, 2018a).

Bearing this in mind, the Portuguese UGGp have developed their educational activities based in this framework, using the existing geological heritage of the territories to explain and create awareness about the need of an education for an environmental sustainability and a way to achieve a green sustainable growth.

In June 2017, the Ministry of Foreign Affairs of Portugal presented a national report on the implementation of the 2030 Agenda for Sustainable Development (Ministry of Foreign Affairs, 2017). It is highlighted in this report the work done by the Portuguese NatCom for UNESCO in the field of education for sustainable development. In this domain it has been vital the partnership with the Portuguese Forum for UGGp and the Portuguese National Committee for the International Geosciences Programme (IGCP), focusing particularly the Educational Program "GEA – Mother Earth" with training courses based in the SDGs of the Agenda 2030 and the capacity-building role of the UNESCO Chair on "Geoparks, Sustainable Regional Development and Healthy Lifestyles". This means that through a strong cooperation with all these partners, UGGp have been readjusting and adapting their educational programs and educational offers based in the Agenda 2030 and in particularly the SDG 4, but also collaborating in the development and promotion of the Educational Program GEA – Mother Earth, working each school year together in the framework of the Portuguese Forum of UGGp activities, developing different school contests, promoting itinerary exhibitions and promoting training courses in their territories. This has been promoting the mobility of students between those territories, contributing in a positive way for the achievement of SDG 4 and even involving other UGGp, such as Araripe UGGp in Brazil, in a progressive movement towards the implementation of SDG 4 and its targets involving UGGp that speak Portuguese.

6 Conclusions

Recalling the definition of UGGp considering these territories as "single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development" (UNESCO, 2018a) and also that the 2030 Agenda provides a new framework for development cooperation over the next years, the UGGp can be and act as effective key actors in the implementation of SDG 4. By being part of the UNESCO family, they recognise the importance of education as a vital engine to promote a transformative change, through its work to ensure that all learners have the skills and knowledge they need to become responsible, green, global citizens, supporting the development of education systems and promoting lifelong learning opportunities for all and as expressed by SDG 4, (UNESCO, 2017). In the same way, sustaining and enhancing the dignity, capacity and welfare of the human person, in relation to others and to nature, should be the fundamental purpose of education in the 21st century (UNESCO, 2015).

In this sense, the vision embodied in the educational programs and activities developed by the Portuguese UGGp have an integrated approach and seek education for all, following directly or indirectly the main targets of SDG 4. In line with this reality, the Educational Program “GEA – Mother Earth” brought this vision when promoting an information in context. It did not just focus on the causes and consequences of the pressure that our Planet is facing by human activities, but gave especial attention to provide new tools to educators, teachers and students to make them feel that they can and that they are also part of the solution, towards the environmental, social and economic problems, among others, that we face nowadays. Demonstrating in practice the dynamics of Planet Earth using the geological heritage in connection with all other aspects of the natural and cultural heritage of these territories, and using them as living laboratories, it has allowed not just the theoretical explanation but also the practice provided by many field trips, allowing to touch, see and feel in first-hand what it is explained in the classroom and in the school textbooks.

As stated by UNESCO (2015b), knowledge required is not prescribed by a central authority, but identified through schools, teachers and communities. It is knowledge that is not merely transmitted but explored, researched, experimented with, and created according to human need.

It is in this framework that the Portuguese UGGp face several educational challenges, when trying to contribute for the implementation of the SDG 4 and its targets. Therefore, they are always trying to improve and to be more creative and innovative in their educational offer. In their own educational packages or in the joint educational activities in the context of the competences of the Portuguese Forum for UGGp, the Portuguese UGGp seek to create and develop new tools to bridge educational goals and the processes to reach them.

Finally, bearing in mind the need to develop new educational strategies, the UGGp are aware of their role in this field and understand that learning to learn also has never been as important as it is today (UNESCO, 2015 b). But also, that networking at an educational level is indeed an especial requirement to reach a better and sustainable world. By playing this role, UGGp may also contribute to make recommendations for catalytic action and give their positive contribution for SDG 4.

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