

SECTION 2 – World Heritage.Climate.Education

The second block of the conference, just like the documentation, was made up of good practice examples in the following three areas: education for sustainable development, world heritage protection and world heritage education, which were presented by the respective project managers. The keynote speech was held by Dr. Antje Brock from the Institut Futur at Freie Universität Berlin, entitled "Setting yourself in motion - How can unique places enhance sustainability-related learning?". This introduced the conference with theoretical educational concepts, analyses of education for sustainable development and its intersections with World Heritage education. This was followed by reports from the climate station network of UNESCO Associated Schools and the Trilateral Wadden Sea Youth Conference. Those responsible for the management of the two World Heritage sites, the Palaces and Parks in Potsdam and Berlin, and the Historic Centre of Regensburg with Stadtamhof, reported on how they are dealing with the challenges of climate change. The first of two examples of World Heritage education is an e-learning tool on the topic of water in Augsburg and the Erzgebirge/Krušnohoří mining region. The second is the Young Climate Action for World Heritage project of the Berlin Research and Science Centre for the Heritage of Humanity, the Institute Heritage Studies (IHS), which is funded by the German Federal Environmental Foundation and implemented in cooperation with the Federal Coordination of UNESCO Associated Schools of the German Commission for UNESCO.

“I would rather have a mind opened by wonder than one closed by belief.”

Garry Spence (1996)

Keynote: Setting yourself in motion - How can unique places enhance sustainability-related learning?

Dr. Antje Brock, Freie Universität Berlin, Insitut Futur

Emotions and the environment - Importance for learning and education

There are no rational thought processes without emotions being closely linked to them. Rather, thinking and feeling are inseparable parts of our "cognitive system". Accordingly, good education cannot succeed if the central role played by emotions is not recognised. This also applies to sustainability-related education and world heritage education. But what difference does it make how we understand learning and human cognition? Learning and education are still characterised by an idea that no longer holds up to newer scientific perspectives. Traditionally, the understanding of learning was sequential in the classical Cartesian sense: something is perceived, processed by the brain, then evaluated and acted upon. However, more recent approaches question this. They follow a more embodied, integrated understanding of how the brain, body and environment interact with one another. These approaches, such as "embodied cognition" (Fugate 2019), "grounded cognition" (Barsalou 2008) or "tacit knowledge" by Kaaronen (2018 with reference to Michael Polanyi), broaden the focus: Instead of a "one after the other", a closely intertwined system is assumed here, a constant interaction of thinking, remembering, feeling and "external" factors of the environment. This perspective is important for sustainability and world heritage-related learning in two ways. Firstly, without a clear understanding of how learning and education works, including the importance of emotions and the material environment, it is not surprising that the so-called knowledge-action gap persists despite a good level of knowledge about sustainability. Secondly, the new understanding of human cognition changes the view of the material environment in a decisive way. The environment takes on the role of a constant (co-)pilot in learning and educational processes. As a direct, continuous part of learning processes, it is recognised as a co-constituent of learning and education (see Brock 2022). This makes a significant difference in terms of content (and symbolism).

Newly learnt material is thus imprinted in the brain as a complex system of thought, sensory perceptions, physical sensations and interactions with the environment, and is later recalled as this complex system when remembered. In this way, all learning is embodied and interacts more with the environment than most formal educational settings provide for. We therefore miss out on important opportunities if the direct physical environment of learners is not actively and centrally involved in educational programmes. Formats such as excursions, educational trips and content-orientated learning settings are aware of this importance. This is precisely where the great potential for sustainability-related education lies, and the role that World Heritage sites can play in this.

Potential of interlinking World Heritage and sustainability-related education

Promoting competences in the context of sustainability is not trivial. The content is complex, and it is important not only to focus on climate change, but also to take into account all "planetary guard rails" in combination with demands for justice (Rockström et al. 2023). There is also widespread pessimism about the future, including among young people, as well as an associated agency problem, i.e. the feeling of not being able to make a relevant and meaningful contribution in view of the scale of the problem. On top of this, there is a perceived lack of implementation at the political and economic decision-making level. This mixed situation often leads to negative emotions. In addition, it is becoming increasingly clear that sustainable development is not only used as a unifying but also as a divisive concept in discourse.

This raises the question of how we can talk about sustainability and convey skills that promote more positive emotions and contribute to cohesion. Based on the newest understandings of cognition just outlined, what are the possibilities of linking sustainability and world heritage education more effectively? Sustainability and World Heritage education have interesting overlaps. Both are characterised by thinking in "broad strokes". This applies to time and space. How is the local connected to other places, where is it even embedded in global contexts? In the case of sustainable development, the question is: What has an impact on the justice demands of current or future generations? Cultural and natural heritage have the potential to put the present into perspective in a positive way. They are an invitation to see oneself or current developments in a long chain of events - at best, they can even create a kind of "upliftedness". World Heritage sites can therefore offer important aspects of sustainability-related education: awe or awe-experiences (Keltner & Haidt 2003). These are resonance experiences that have so far been neglected in (formal) sustainability-related education. Such so-called "self-transcendent emotions" (Yaden et al. 2017) take the focus off the "self", broaden perspectives and are experienced as significantly meaningful. Not only can they contribute positivity where future-related fears and worries arise, but can also promote a stronger connection with places and people. There seems to be potential here not only to connect both educational approaches in a more profound manner conceptually, but also to live them more intensely in practice.

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Subsection 1: Education for Sustainable Development (ESD)

Article 1: Young Citizen Science for climate protection and ESD. The climate station network of UNESCO Associated Schools

Klaus Schilling, German Commission for UNESCO

In the climate station network of UNESCO Associated Schools, which was set up by the German Commission for UNESCO in cooperation with the Heidelberg UNESCO Chair of Prof. Dr. Alexander Siegmund and dm-drogerie markt, 13 schools are active with their climate/weather stations set up during the project period. The schools work together in these joint events to promote climate protection and education for sustainable development (ESD). Highlights include the annual climate camps for students from the UNESCO Associated Schools in Heidelberg and the observation tasks to collect local climate data. The data from eight stations in the network is already available to the public and can therefore also be used by other partners and stakeholders in the local communities.

The Paul Robeson School is using its climate station in a joint project with the Leipzig Botanical Garden to closely analyse the annual development stages of eleven different plants. The data on germination, the first leaves, flower formation, fruit formation and wilting of the plants are precisely recorded. This data is compared with the physical measurements from the climate station and can then be put in relation to climate change over the years. For example, the schools collect data on local apple blossoms throughout Germany. The data recorded on this can then be compared with the data series from the climate stations on temperature and precipitation trends. Together with the support of the UNESCO Chair team, the data series are analysed and processed in a Germany-wide comparison of the different locations. The network's online events and the multi-day climate camps in Heidelberg provide an important forum for this. The measurement data can be used to visualise the specific consequences of climate change on site and inform the local public accordingly.

The examples of the observation assignments in the climate station network show how the work with the climate stations functions in terms of a research-oriented, science-propaganda approach and the value of such collaborations in Young Citizen Science projects for all sides. dm-drogerie markt is also actively involved in the project and has set up its own climate station on the grounds of the company headquarters in Karlsruhe. In line with the Whole School Approach of the UNESCO Associated Schools, the climate stations are embedded in a corresponding school and lesson development programme as well as close cooperation with school authorities, local authorities and other local initiatives in order to promote sustainable development for a climate-neutral school and society.

The commitment of young people also plays a key role here. At the annual camps and online events, they can network with each other and share important experiences and insights - for example, on the establishment of climate parliaments or participation in municipal youth parliaments. Together with the municipal climate protection officers, a separate online event was also held in 2022 to highlight the potential of climate stations as an anchor for climate-friendly local development. Together, the interdisciplinary network of all participants is thus making a contribution to ESD and climate protection. In the future, data from other locations in the global network of UNESCO Associated Schools and the Young Climate Action for World Heritage project will also be added.

„ More trilateral exchange is needed to share ideas and find solutions, be it in the form of volunteering, internships, university or research programmes“

A participant of the Trilateral Wadden Sea Youth Conference

Article 2: Trilateral Wadden Sea Youth Conference

Simone Prestes Dürrnagel, Joint Wadden Sea Secretariat

The Trilateral Wadden Sea Youth Conference (TYC) promoted youth ownership by raising awareness, sharing insights on existing young adult engagement and identifying their interests and visions for cooperation. The conference took place from 1st to 4th of September 2022 in St. Peter-Ording, Germany, and brought together 46 young adults from Denmark, Germany and the Netherlands who were already involved or passionate about the Wadden Sea World Heritage. The conference was attended by young people from different backgrounds - students, volunteers, young professionals and entrepreneurs. "The TYC was a great opportunity for us young people who are committed to the Wadden Sea to network, stay in touch and continue to work on expanding existing projects and increasing the impact of youth on the conservation of the Wadden Sea," said one of the conference participants.

The event was organised by the Common Wadden Sea Secretariat (CWSS) on behalf of the Trilateral Wadden Sea Cooperation (TWSC) and supported by the Federal Agency for Nature Conservation (BfN) with funds from the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV). The Schleswig-Holstein Wadden Sea National Park Authority hosted the event on site. The event was moderated by Anja Szczesinski from WWF Germany, Irina Bartmann, moderator and coach, and a team from the UNESCO Chair for Futures Literacy at the University of Hanze and One Resilient Earth (ORE).

The stakeholders were in regular dialogue for three months in order to increase their influence on the protection of the Wadden Sea. The follow-up process was both youth-orientated and youth-led, and was coordinated by the CWSS. The CWSS organised a series of webinars on the history and work of the cooperation, coordinated the network for sustainable tourism in the region and presented examples of youth engagement on an international level. The UNESCO Chair and ORE developed mentoring sessions to support the elaboration of the message the young people want to convey and to explore presentation formats. The young adults organised working groups to refine their perspectives, communicate successes and prepare contributions for the 14th Trilateral Governing Conference (TGC14), which took place in Wilhelmshaven at the end of November 2022.

At TGC14, the young people's contributions were presented by 16 representatives in the form of a speech and an exhibition. They also discussed further opportunities with the members of the Wadden Sea National Park Board. Their main messages covered topics such as conservation of the area, sustainable economic practices, communication and education, transformation and youth participation. In addition, they are building a trilateral youth network to continuously involve and connect young adults in the three countries and represent them in political decision-making processes. The detailed organisational structure, an online platform and other activities are currently being planned.

Subsection 2: World Heritage Protection

„ Engaging with experts is essential. However, in order to develop targeted programmes, we need to find out what motivates the target group itself.“

Katharina Matheja, Prussian Palaces and Gardens Foundation

Article 1: Climate change in historic gardens and park landscapes - threats, challenges and solution strategies

Katharina Matheja, Prussian Palaces and Gardens Foundation

Since 1990, the majority of the grounds of the Prussian Palaces and Gardens Foundation have been part of the UNESCO World Heritage Site Palaces and Parks of Potsdam and Berlin. The main tasks of the foundation are to preserve and protect the palaces and parks, as well as to communicate this accomplished architectural and garden art, known as "Prussian Arcadia". In numbers, this means the care and maintenance of approx. 750 hectares of park, 170 kilometres of park paths, 80,000 trees and 220,000 flowers as well as 600 architectural monuments spanning five centuries.

In recent years, these tasks have become a growing challenge - changes in the climate and the resulting increase in extreme weather events are having a noticeable impact on the condition of buildings and gardens. While the historic buildings are primarily suffering from more extreme temperature changes and new damage caused by pests or fungi, the fragility of the World Heritage Site is particularly evident in the gardens. They are suffering from more frequent periods of drought, followed by heavy rainfall.

For the SPSG, this means making every possible effort to adapt the palaces and parks to the changing climatic conditions while adhering to conservation guidelines. Various projects in co-operation with research institutes and other garden administrations are therefore aimed at developing specific recommendations for action and their practical implementation. For the gardens, the temporal dimensions must also be taken into account: They are "living" monuments and, unlike built cultural assets, are actively involved in adaptation, but often require several years to do so. Many of the measures taken therefore only show their effect after five to ten years.

However, informing visitors and involving them in our activities are also essential for the preservation of the gardens. A lack of understanding often unintentionally leads to misuse or vandalism, and thus resulting in an additional threat to the historic gardens.

Participation strengthens identification with the World Heritage Site, especially among younger generations. For example, school children who replanted trees in Sanssouci Park three years ago together with SPSG employees regularly return to "their" park trees and act as valuable multipliers among friends and family. In addition to local networking, transnational networking is also important. As part of the Young Climate Action for World Heritage project funded by the German Federal Environmental Foundation (DBU), school students from Poland and Germany visited the New Garden and Babelsberg Park in Potsdam. They gained an impression of the threats and risks to the historic gardens as well as their beauty and potential for climate, biodiversity and ecosystems. Workshops were held to develop initial ideas for preserving and communicating the World Heritage Site, which will be further de-

veloped in the following school year. We are looking forward to the students' ideas and suggestions, which will make an important contribution to communicating our World Heritage Site.

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“Cultural heritage acts as a place of identification and what many people call home. It is a tool to bring people along in transformation processes. We need to broaden our view and perception of the role that cultural heritage plays in these processes.”

Dr. Matthias Ripp, City of Regensburg

Article 2: World Heritage Education für a climate-conscious sustainable development

Dr. Matthias Ripp, Stadt Regensburg

World Heritage Cities and Climate Change

Climate change is a global challenge for us all and therefore also for World Heritage Cities, which are made up of the interplay between the people who live there, their lifestyles, traditions and the objects within them. Three factors in particular pose challenges: Temperature fluctuations, water and demographic change.

Temperature fluctuations affect the soil structure of historic buildings and cause additional damage. Regensburg, with its stone historic centre, is particularly exposed to heat.

The water factor refers to the increasingly frequent heavy rainfall events, often in connection with heavy storms and flooding, and the rising water levels. But invisible changes are also a problem - many building structures suffer from fluctuations in humidity.

The third challenge is demographic change. Ageing and migration are changing the composition of urban populations, which ultimately requires World Heritage cities to adapt their educational work and its content.

How are we dealing with these challenges in Regensburg?

Regensburg is to become more sustainable through various co-operations, educational measures and concrete conversions. For example, the city of Regensburg has decided to set up a sustainability trail with 15 stations that convey the goals of the Global Agenda 2030 and background information on global and regional connections in the form of a quiz.

Green Deal in Regensburg

The sustainability trail presents various ideas and projects. But what does that mean in concrete terms? What does the "Regensburg Green Deal" look like?

Since 2021, all activities relating to energy and climate protection have been bundled. The aim is to reduce greenhouse gas emissions by 65% by 2030 when compared to 1990. By involving various stakeholders from business, science and environmental organisations as well as citizens, the city administration and all its subsidiaries are to become climate-neutral by 2030 and the city as a whole by 2035. The aim is also to fully utilise energy-saving potential and expand the use of renewable energies.

Concrete goals include prioritising the use of eco-friendly transport when making decisions about the transport system, strengthening cycling and walking and reducing stationary traffic and private transport. To this end, local public transport is to be made CO₂-neutral and become more attractive for commuters through better connections between the city and surrounding areas. Bicycle hire systems will be introduced and a cycle station set up at the main railway station. At the same time, there is a constant exchange with the public and the economy and further training is offered on climate-friendly transport behaviour as well as funding for new climate technologies.

Regensburg: The climate-resilient historic city centre?

At public events, the desire for a pleasant old town centre with a "feel-good atmosphere" for all generations was expressed. In order to prevent overheating, more water and greenery are to be integrated into Regensburg's historic city centre.

The realisation of these plans still needs to be planned in detail. Ultimately, success also depends on whether politicians back the plans and whether the city's population is actively involved in the planning process.

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Subsection 3: World Heritage Education

„Digitisation of cultural heritage resources in the form of e-learning can be used to raise awareness of local natural/cultural heritage values among the younger generation and help them understand global challenges and local solutions.“

Ping Kong, Heritage & Education

Article 1: E-learning tool on the topic of water in Augsburg and the Erzgebirge/Krušnohoří Mining Region

Dr. Ping Kong, Heritage & Education

World Heritage education plays an important role in sustainably preserving our shared heritage and enabling sustainable education for future generations. Heritage & Education gGmbH (H&E), a non-profit organisation based in Berlin, is working with World Heritage Sites to develop cross-curricular e-learning materials for school children aged 9-16. The e-learning curricula focus on the outstanding universal value of World Heritage sites and the knowledge they hold. The aim is to empower the next generation of experts. The curricula are based on the Education for Sustainable Development (ESD) approach and enable learning from the past and responsible action in the present. Practical examples are intended to prepare students for future challenges.

In a participatory process, H&E works closely with World Heritage authorities, local experts, schools and educational professionals to develop interactive, multi-sensory learning materials in digital and analogue formats. Through the use of interactive EduTech and active pedagogy, our e-curricula enable students to learn at their own pace on an open-source platform that is freely accessible to all educational institutions.

The first e-learning series on water management was developed in collaboration with two World Heritage Sites in Germany. It aims to inspire students to explore the water environment and human interactions with water in different subject areas: geography, history, science (STEM) and climate change. The e-learning prototype about the Erzgebirge/Krušnohoří Mining Region included innovative features to meet the interests and needs of the students. It was tested at various schools and received positive feedback. Based on an analysis of the user experience, many improvements in the visual and didactic design were implemented in the new e-learning curricula for the World Heritage Augsburg Water Management System. Our e-learning curricula are designed to provide a student-centred, autonomous learning experience while flexibly supporting classroom instruction by aligning learning objectives with the curriculum and ESD. Key features include:

- Adventure stories with Bo/Bilibo (mascot): Contextualised examples are designed to spark curiosity and motivate pupils to explore local solutions to global challenges;
- Media diversity through multi-sensory and inclusive technology: different learning styles and needs are addressed and interest is maintained throughout the learning process;
- Involving local communities in the creation of content: The water management system is shown from both a tangible and intangible perspective by interviewing local experts and making connections to local attractions;

- Explanatory videos and graphics with gamification design: Supporting knowledge absorption and understanding of key concepts and experiencing the learning environment at your own pace;
- Complementing the interactive online content with practical offline activities: Enabling flexible use in different educational environments and reinforcing competency-based learning.

The e-learning curricula support the digital transformation of cultural heritage and offer valuable opportunities for World Heritage education as well as the interpretation of World Heritage sites. They are available free of charge in English and German and can easily be offered in other languages. They have various applications to reach a wider range of schools, for example through intercultural exchange, language studies, project-based learning, E-Twinning and flipped classrooms. H&E is committed to realising the educational potential of World Heritage sites through innovation, collaboration and participation.

„The project opened my eyes and showed me that not only do we have to do something to preserve the future, but also to save the past and our world heritage sites.“

Student from the Young Climate Action for World Heritage Project about the Haithabu and Danewerk Archaeological Border Complex

Article 2: Young Climate Action for World Heritage

Claudia Grünberg, Institute Heritage Studies and Jasmin Frischmeier, German Commission for UNESCO

Climate change is one of the greatest threats to the conservation of UNESCO World Heritage Sites. Protecting them from climate change and at the same time utilising their potential for sustainable development is therefore a key task for current and future generations. It is thus essential to tap into young people's desire to take action, motivate them to take responsibility at World Heritage Sites and meet the challenges posed by climate change.

This is where the Young Climate Action for World Heritage project comes in, linking World Heritage education with the 2030 Agenda and Education for Sustainable Development (ESD). In the transnational education project, school students at World Heritage Sites in the 2022/2023 school year addressed the question: How can we take responsibility for the sustainable preservation of World Heritage sites and the fight against climate change on site?

The project by the Institute Heritage Studies (IHS) and the German Commission for UNESCO (DUK) is funded by the German Federal Environmental Foundation (DBU), the participating World Heritage Sites and the State Office for the Preservation of Monuments in Saxony.

In autumn 2022, six school groups from Germany, Denmark, the Netherlands, the Czech Republic and Poland each explored a World Heritage Site in workshops lasting several days:

- Wadden Sea
- Haithabu and Danewerk archaeological border complex
- Rammelsberg mine, the historic centre of Goslar and the Upper Harz water management system
- Palaces and parks in Potsdam and Berlin
- Erzgebirge/Krušnohoří Mining Region
- Settlements of the Moravian Church, part of Herrnhut (World Heritage candidate)

The workshops were characterised by an interdisciplinary approach and a mix of methods. The focus was on individual, collaborative, cognitive, creative, reflective, dialogue-based and, above all, practical work processes, which stimulated the exploration of the world heritage in a variety of ways. The cross-border cooperation between the young people was particularly inspiring and a basic ESD principle - think globally, act locally - could be experienced in practice. In addition to the threats posed by climate change, the young people also explored how World Heritage sites themselves can contribute to sustainable action: They were able to experience and try out traditional water utilisation, sustainable building and gardening as well as nature and landscape conservation.

The young people worked intensively on realising the projects they developed in the workshops and becoming ambassadors for the World Heritage Site themselves. The DUK, the IHS, the World Heritage Sites and the supervising teachers supported this process. In terms of ESD, the focus was on the active and independent organisation of the projects by the young people. Conceptualisation days, exchange formats for teachers and webinars as well as contact between schools and experts supported this process.

The young people's projects create a diverse mosaic that reflects their creativity and interests as well as the special features of the various World Heritage sites. The focus is always on the young people's perspective on the World Heritage Site and climate change. In addition to

short films, podcasts, escape games and infographics, climate camps and projects on climate-friendly World Heritage cities were planned and implemented. The results were presented at the World Heritage sites and schools in summer 2023. The resulting impulses for an innovative link between World Heritage education and climate change are compiled in a handout for stakeholders in the field of education.