

Concepts for multidisciplinary learning with young adults

Combining biodiversity education, new technologies and social learning

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The Co-Evolutionary approach of Climate Change Adaptation

This edition of *Adaptation and Beyond* reflects on participatory approaches to climate change adaptation, and the importance in this of processes that enhance social learning. We reflect on some successful approaches followed to engage young learners and other members of rural communities in deepening their understanding of the local environment and their relationship to it.

Many people associate climate change adaptation with the development of technical solutions to the impacts of climatic change, and imagine that a comprehensive set of tools will enable affected people to respond more effectively. This concept assumes that people merely need to learn about new technologies and understand how to apply them for adaptation to be successfully achieved. However, just as climate change does not evolve in a linear fashion and its impacts are not precisely predictable, so too is successful adaptation a complex, iterative process rather than a simple solution or set of solutions. When working with learners and young adults we have to consider the different circumstances that make learning for effective climate change adaptation unique and essentially innovative.

As described by Collins, adaptation can be conceived of as a co-evolutionary process in which the 'process' aspects are crucial. Collins equates adaptation with a good, somewhat worn pair of shoes. The shoes are flexible and comfortable. However, if we do not wear them they might become stiff and inflexible, or the wearer's feet might change over times so that the shoes no



longer fit. The concept 'a good pair of shoes' may thus be understood in terms of the interaction between the feet and the shoes. Applying this analogy to climate change adaptation, people affected by changing climate must needs constantly adjust and change in response to anticipated or experienced changes in their environment. The process is a co-evolutionary one.

The interaction between a person, community or the systems that they operate and the wider environment should thus also be flexible and infinitely adaptable over time, and thus sustainable in the long term. It is patently unrealistic to deal with 'the problem of climate change' as if it were a finite issue. Instead of focussing on the problem of climatic change, the co-evolutionary approach addresses problems related to social constructions and the limited solutions and opportunities to challenge climate change. In order to stress the participatory, active and innovative character of successful community-based adaptation it therefore makes more sense to shift to a paradigm that uses the language of 'adaptation with' rather than 'adaptation to'.

Multidisciplinary learning events to empower young adults

Young people today are increasingly aware that they are facing an uncertain climatic future in the face of which many economic, social and political expectations will prove unachievable. In the face of such an unpredictable future it is important to enable learners to understand how they can create and contribute to more sustainable development. The risks associated with climate change are highly uncertain but will have a great influence particularly for those parts of societies dependent on resources that are sensitive to changes in the climate. The societal vulnerability to climate change may therefore exacerbate existing social and economic challenges. In this context, education about biodiversity can be understood as being more than a means to generate greater awareness of, and appreciation for the value of conserving the natural environment. Biodiversity education can also be used as a means to develop a broader range of capacities amongst young people. Active involvement in environmental educational activities can help young people to gain the knowledge and skills that they need to improve and sustain their lives.

Multidisciplinary learning events which are designed to empower young adults and provide them with the knowledge and tools necessary for them to become more active in their communities also create opportunities to address a wider range of objectives and engage learners in interactive learning experiences that are profoundly stimulating and enjoyable. By involving learners in extra-curricular events like BioBlitzes and Winter and Summer Schools one can address a range of objectives including raising awareness of biodiversity and the need for conservation, enabling proficiency in the use of technical equipment and personal development of learners. Eco Talks in the village of Nieuwoudtville have successfully brought locals and experts together and have fostered exchanges of ideas and knowledge about biodiversity and tools for nature conservation.

In the following section we discuss several aspects of multidisciplinary learning events and focus on participatory aspects and human capacity development in vulnerable communities. We emphasise why multidisciplinary learning events require good planning, clear objectives and a clear structure to achieve the desired impacts.

Combining education for biodiversity with modern technologies

Biodiversity education must address the diverse understandings of what biodiversity consists of. Knowledge about biodiversity and the infinite interactions of living organisms remains incomplete. At the same time, the values that inform people's appreciation of biodiversity are variable and dynamic, and must also be addressed in learning processes. Without a broad appreciation of the many ways in which biodiversity contributes to meeting our complex needs as human beings, educators are likely to focus on aspects or processes of learning that are relatively unexciting to young learners. Multidisciplinary approaches within biodiversity education introduce multiple perspectives and acknowledge different 'ways of knowing'. As the topic of biodiversity lies at the intersection of society, economics, science and technology, it has the potential to bring together different groups in society in the search for common understandings of issues such as nature conservation and sustainability and introduces learners to rich areas of knowledge and experience. Participation in a discourse that investigates the natural world ('science-in-the-making') as well as activities in a community environment provides multiple opportunities for learners to broaden their horizons. Experiencing the exhilaration of being outside in the veld, experiencing and investigating biodiversity as well as participating actively in debates and interactive exercises enable young people to learn for sustainability.

There are a number of different but potentially complementary perspectives on biodiversity education.

First of all, from a 'nature and self' perspective events like BioBlitzes create opportunities to experience nature first hand. While enjoying landscapes and being outdoors, appreciation for nature is stimulated and as a consequence awareness of the value of biodiversity conservation.

Secondly, acquiring knowledge or 'ecological literacy' allows learners to become acquainted with the intricate relationships between the different species in an ecosystem, as well as the human influence on these ecosystems and the consequences thereof. For example, popular presentations by scientists provide a great opportunity for young people and others to learn about their local environment outside the context of formal education. Direct interaction with researching scientists provides opportunities to interrogate their knowledge, methods and assumptions. Scientists, on the other hand, may use the platform to directly inform and influence the wider public, while giving up-to-date information relating to their field of expertise. Both have the opportunity to share experiences and gain from one another's knowledge. Furthermore, providing scientific knowledge within the

What is a Bioblitz?

A BioBlitz is a short term event (8-48 hours) in which teams of volunteer scientists, land users, students, teachers, and other community members work together to find and identify as many species of plants, animals, microbes, fungi, and other organisms as possible. It is an intense period of biological surveying also aiming at raising public interest in biodiversity. To encourage more awareness and public participation, BioBlitzes are often held in conserved areas to which the public has access, such as parks and nature reserves near residences.

Goals and benefits: Why to organise a Bioblitz

Discover: count, map and learn about the living creatures in the veld. Identify rare and endangered species/groups.

Document: gather taxonomic information and add them to the official species lists. Due to the bigger groups of people working together it is more likely to uncover rare species and gather a lot of information. Even though not everyone can be an expert, a basis for a further and more complete inventory of species occurrence can be provided by the BioBlitz.

Exchange: meet the scientists and use the chance for a knowledge exchange. The opportunity to do fieldwork together fosters interaction and gives learners and the normal citizen to ask experts a lot of questions about their work, plants and animals.

Local: a BioBlitz offers the chance for people to discover their local surroundings and brings the community together.

Public awareness: A BioBlitz may also be a good event to invite journalists of local newspapers to and raise public awareness through the media.

Protecting biodiversity: the nearby settings are important to conserve

Fun: The child naturalist within knows that crawling around in the woods and fields looking at plants and animals is about as good as it gets. Unlike of other scientific events, BioBlitzes have the atmosphere of a festival. It is exciting, and therefore a very useful tool to work with learners and young adults.



What is iSpot?

iSpot southern Africa is an internet platform provided by SANBI for sharing and identifying 'local' biodiversity, and is open to everybody. It is a 'citizen science portal for southern Africa providing photographic, distributional and biogeographic data on all taxa, with species lists, surveys and atlas opportunities'. (<http://www.iSpot.org.za/>)

Interested citizens can post pictures, request identification and share information, take part in courses on taxonomy and learn. The website is a virtual museum, a learning platform/tool for education on biodiversity and an atlas. You can find hubs for surveys and backyard biodiversity projects.

For more information visit www.sanbi.org.za

Winter and Summer Schools

Like BioBlitzes, Winter and Summer Schools are a means to raise awareness of biodiversity and the local environment in the community. A one-week programme is offered annually in June and December for local children of 6 or older. The programme varies every year and is developed in cooperation with teachers, researchers and other NGOs.

Activities include hiking in the nearby nature reserves, learning plant monitoring and how to use a GPS in the Hantam NBG or the Nieuwoudtville Flower Reserve. However, playing games and using creativity also plays a big role during the week. As the Winter Schools are attended by children and learners of different ages, a learning environment is created that gives opportunities and space to participants of varying knowledge backgrounds. Winter and Summer Schools are not only learning events about biodiversity, they are also a tool for capacity development. Children who do not have the opportunity to travel to other places during their holidays get the chance to get in touch with their local environment. Although teaching about the background of biodiversity conservation takes a big part when working with learners, the main objective of Winter and Summer Schools is to give learners the tools for developing their knowledge further on their own.



context of biodiversity education can help local people and learners to understand their own impact on the environment and gain insight into, and inspiration for potential common activities. This first-hand information can encourage the adoption of a more sustainable lifestyle within the community.

Finally, biodiversity education promotes an understanding of the influence and importance of politics, legislation and international agreements on biodiversity conservation. It can also illustrate the importance of participation in democratic processes to create more responsible and sustainable communities. Together these perspectives can provide learners with the resources and tools to become active themselves.

In the context of empowering young people to become active within their own community, it is important to integrate working with modern technologies. The current landscape of rapid technological and social change is transforming our ways of living and working. Young people are rapid adopters of new technologies, and are more and more connected at a digital level using social platforms like Facebook. Educational approaches that foster lifelong learning and access to technologies and knowledge on different levels are increasingly attractive to the youth. If learners are able not only learn how to use tools and software, but also get the means and resources that are necessary to engage in an environment of social and technological change they are likely to acquire and use these skills proactively because these tools are relevant for both their private interests as well as for employment in a modern working environment. They also have an important role to play in creating more lively and active communities. As a consequence environmental education should have diverse learning objectives, including the acquisition of knowledge and the development of skills and capacities.

BioBlitzes are particularly useful learning tools for cooperative learning and working, as well as for sharing of ideas and knowledge. The

Eco Talks

Eco Talks are hosted in Nieuwoudtville by Indigo. Local and visiting scientists are invited to give presentations about their current research or field of expertise. Presentations mostly deal with the local biodiversity, flora and fauna. During the 2012 spring flower season Eco Talks provided the opportunity to learn about special bees, pollinating mice, dragonflies and endemic plants. Eco Talks are a good opportunity for local people to meet scientists and ask questions. First of all, Eco Talks - like BioBlitzes - create a space for experts and local people to get in touch and exchange knowledge. Eco Talks make expertise accessible to the public, while researchers can also profit from linking up with local people, many of whom have long-term experience of the local flora and fauna.



multidisciplinary approach of BioBlitzes combines aspects of natural sciences with community engagement and understanding for modern technology. The identification of different plants plays an important role, as does the use of tablets, digital cameras and internet platforms as some examples of trendsetting technology.

The participatory approach of BioBlitzes is based on demand-driven learning and should support the exchange of knowledge within groups as well as creating collective intelligence. Within the multidisciplinary learning context of biodiversity education and technical change we envision learners as active participants and co-producers rather than passive consumers of content. Learning is a participatory, social process that can and should support the formulation and achievement of personal life goals and create opportunities for developing personal interests and skills.

Learning as a means of 'social becoming'

In keeping with the learning approach of 'adapting with' for sustainability and becoming active for environmental protection, we require a new understanding of the interactions between actors within a community. One response has been the emergence of social learning as a form of praxis for the transformation of situations characterized by uncertainty, complexity, interdependencies and multiple perspectives. Social learning is seen as a way to develop and empower oneself - a way of social becoming. Social learning is understood to include open communication, evolving thinking, and problem solving in collaboration with others. The concept of social learning has both a cognitive and normative dimension and it can be seen as both a process and an outcome. Social learning occurs when people engage in a (learning) process together and interact, sharing ideas and perspectives. Central elements of social learning are therefore participation and communication within a group or community. Although it might also be considered an objective in itself, social learning particularly stresses the importance of the way of learning.

On the normative level, social learning aims at responsible interaction within a community of people and primarily addresses the social processes and dynamics within the group. As a consequence, it is as useful for learning new things concerning technology and biodiversity as it is for learning to work together as a group. In the course of the various environmental learning events referred to above, several common elements have contributed to successful social learning. Sound planning and a good structure for the learning event is important, taking into account the importance of creating an active learning environment that supports the participation of all learners and fosters cooperative learning and exchange. In the case of the BioBlitzes, it was very useful to have small learning groups of about 7 people, where experts and learners could communicate and interact personally and could support each other on different levels.

During feedback sessions participants noted that they liked meeting new people and having a mixture of young and older people, experts and learners. Spirit, enthusiasm and respect were all part of creating a learning atmosphere that participants appreciated. Acknowledgement of the contributions of participants and celebrating the achievement of common learning goals were also important. Positive outcomes of events like BioBlitzes, Eco Talks and Winter and Summer School have been to create new contacts, enable people to make new friends and also to re-invigorate and re-create exiting relationships.

Becoming active for biodiversity, together

As social learning fosters different levels of learning including feedback and 'learning how to learn', it also supports changing patterns of interaction within the community beyond climate change adaptation and biodiversity conservation. Due to their participatory and social learning approaches, BioBlitzes and Winter and Summer Schools

can have diverse impacts on individuals and society. These types of learning events have the potential to alter the framework through which individuals perceive their personal environment, and to change values, attitudes and behaviour concerning the environment. Furthermore, learning events may have a positive impact on learners' confidence and even their self-perception as an 'empowered' part of the community through the interactions with others. Finally, social learning might enhance individuals' and groups' skills to deal with conflicts. Communities may gain organisational skills that enable them to improve the quality of their lives whilst also enhancing conservation practices and strategies.

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