

The Value of Biodiversity – Tasks of Environmental Education at the Example of the “Tiere Live” Project

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1. Introduction

Biodiversity is one of the biggest treasures for humans by providing basics and quality of life. The value of biodiversity is mainly discussed in Germany's society and politics – like Germany's federal chancellor, Dr. Angela Merkel, said to start the International Year of Biodiversity 2010:

“The issue to save biodiversity has the same dimension and importance as the issues of climate change. (...) Only together we can set the course to save biodiversity and its sustainable use in an effective way. We need a turnaround.” By saying this, Mrs Merkel focuses on the basics for environmental education: “It is essential to explain the importance of biodiversity even better than it used to be. (...) We need a social awareness that individual behaviour is influencing diversity and the state of ecosystems directly. Everybody can make his small contribution to reach this aim.”

Even though environmental topics getting discussed in public the loss of biodiversity in Europe and the whole world couldn't be stopped. A closer look at the Red List of the IUCN shows that even common species going to disappear day by day. This trend will be even faster in the future. This was confirmed by a UN report, released in May 2010. According to this report the reasons of losing biodiversity aren't solved, yet. Furthermore the necessity of Biodiversity is still not involved in politically measures, strategies and programmes.

It is the same problem in Germany: In his book “Kind und Natur” (Kid and Nature) Ulrich Gebhard discovered that environmental awareness namely exists in Germany but it's not done consequently – in other words: the attitude can be compared by empty words. A Survey of adults strengthens his allegation: 96 % of all respondents said the loss of Biodiversity is a huge problem but only 25 % of them thought that this will affect their lives (GEBHARD 2009)

This discrepancy of knowing the threat of our environment on the one hand and the lackadaisical willingness to take action against it on the other has got many reasons.

Initially the following article will present selected results of a recent study, where the “Tiere live” project is connected to. “Tiere Live” is trying to mediate the value of Biodiversity as a task in scholastic and extracurricular environmental education.

2. The Perception and Value of Environment

Gebhard summarizes the results of perception of the ecological situation by teenagers (GEBHARD 2009):

A study of SHELL DEUTSCHLAND HOLDING 2006 shows the trend of teenagers out of a gloomy attitude into confident and pragmatic attitude of their personal future. Young people especially deal with problems which affect them directly and where results can be found easily. It is just normal why issues like employment, consumer desires as well as children and family is much more interesting than environment and ecology. Compared with friendship and experience-oriented behaviour, environmental conscious and nature conserving behaviour is just secondary. Their behaviour is more an approach to economic topics.

Despite the optimistic attitude of their personal future, they are quite pessimistic about the global future. According to "Jugendreport Natur (2006)" more than one third of all surveyed teenagers fear that technique and chemistry could destroy the environment. They even think it might be impossible to solve environmental issues (BRÄMER 2007).

Gebhard cites results that pupils of primary schools already know about the current state of the environment. In the age of 11 till 14 it is even better known. Nevertheless in many studies the trend is shown: the older children become, the bigger gets the unwillingness to conserve nature (GEBHARD 2009).

Gebhard tries to explain: This kind of behaviour is caused by psychological defense mechanisms and displacement reactions (GEBHARD 2009). To know, not being able to change the threatening environmental state causes a playing down (minimization). The much-touted environmental awareness throughout the society loses its subjective interpretation. This defense mechanism is well known as "unreal optimism" or "it won't happen to me"-phenomenon.

It might be a main reason for the low effectiveness of environmental knowledge for the actual environmental behaviour. In addition the objectively rationalistic approach mostly is another reason. Although this allows recognizing and analysing environmental threats but it won't cause any subjective consequences in acting. Maybe "because the relational, self-identity, emotional side is split up" (GEBHARD 2009, 252)

Because of that the significance of identification of children with animals is getting more and more visible. By animals become role models children can experience the environmental threatening.



Fig. A: A hedgehog visits the classroom (Picture: Peter Sturm)

3. The Perception of Biodiversity

Besides the natural the artificial environment is getting bigger and bigger. Experiences out in the real nature and experiences in the new, virtual reality (TV, Video Games and Internet) are in a big competition. Environmental education needs to prove itself against this new generation which is called "Digital Natives" (MAYER 2010).

Because of this increasing alienation between young people and nature, knowledge of elementary ecological relationships will disappear day by day as well as the appreciation and the willingness to save Biodiversity. Missing natural experiences during the childhood lead to a diffused and transfigured image of nature. Teenagers rather tend to a belittlement of our environment (don't harm animals and don't destroy plants) instead of developing a keen awareness for sustainability. This is documented in the "Jugendreport Natur" in 2006 (BRÄMER 2007). Less young people want to experience nature as such. Mostly just for outdoor activities. Even though problems of puberty (like autonomy or identity) can't be solved there teenagers are longing for nature however.

The older teenagers get the less they enjoy to stay outdoor. But delightful and calm moments out in the forests or open landscapes are still more liked by girls than boys. Furthermore electronic Medias like computer games or TV attract children more than nature ever could do. According to a study more than 70% of sixth grade pupils already got their own personal computer or television. This increased the willingness of watching TV or playing computer games of those teenagers more than a half. Teachers and educators are mostly faced with pupils who prefer to have fun and comfort during lessons more than outdoor activities as such (KLEIN 2007).

It isn't surprising that children lost a relationship to nature. Even more the knowledge about diversity reaches a really low level. Only one in three young people in the age of 12 till 15 had ever seen a butterfly or a beetle on the hand. And just one of four had ever seen a deer in real (BRÄMER 2007). Out of the 12 most common birds in gardens only 4 are known in average. 8% not even know one of those birds (ZAHNER 2007). And nowadays many teenagers know more "Pokémon" than native animals (SPITZER 2008).

4. Significance of Ecological Knowledge

Specific knowledge is inevitable for environmental conserving actions. That is well-known but therefore important is the context of this knowledge. It's not enough knowing about the environmental destruction. This is not automatically followed by emotional concern which could lead to a willingness to act. In contrast an ecological guidance of value influences the willingness to act much more effective.

Although the scholastic and extracurricular environmental education contributes to biological and ecological knowledge but it doesn't lead to an emotional orientation. Gebhard recommends "(...) the knowledge shouldn't be kept isolated but gets a chance to connect emotions and imaginations. Only emotional knowledge could lead to act." (Gebhard 2009, p. 254)

That doesn't mean not to focus on knowledge at all. Knowledge in an environmental context can be an "inertly knowledge". That means pupils can learn a lot but don't use it in real life. One aim of environmental education should be to connect environmental knowledge and ethically reflexions together with orientation for action. Knowledge about complex ecological relationships gets a special value as well as the promotion of an ethically ability to reflect ecological topics.

Also the closer look to the pupil's attitude and name and discuss their personal theories could promote an environmentally relevant acting. Not the correctness of their knowledge is important but furthermore how they've learnt and if this knowledge is connected with intuitive ideas and emotions.

5. Willingness to act for keeping Biodiversity

A study examined what kind of factors influencing the pupil's willingness to act for keeping Biodiversity (LESKE 2008). It shows that interest in nature, awareness of endangerment as well as exploring and ecological experiences with nature influence the willingness to act for keeping Biodiversity in a positive way. Also important is a value focused and emotional interest in nature. A positive influence of medial experiences with nature (like movies with nature or animals) was not noticed.

Concluding the study can show:

The development of an awareness of endangerment is fundamental. It is necessary to take personal responsibility for acting.

A transfer of responsibility is encouraged through participation opportunities for young people. Confidence in their abilities can be developed when children and young people actively deal with environmental problems in their private life and experience a validity of personal actions. By identifying and implementing concrete perspectives pupils can learn that it is possible to influence and change situations.

The interest in nature is a strong predictor of environmentally protective behaviour. Regarding to the development of interest an emotional development as well as direct access to nature experience is beneficial. It is also important to consider the age of the pupils. Older students can be motivated by linking relevant examples out of their everyday life.

Both for the development of an awareness of endangerment as well as a rooted emotionally interest in nature, especially the exploratory nature and environmental experiences, is particular important.

6. The Significance of Scholastic and Extracurricular Environmental Education with Regard to Biodiversity

Education and knowledge are prerequisites for interpreting changes not only as risk and in a negative way but also as an opportunity. This opportunity could help to make social developments democratic, humane, socially, environmentally but also it could help to conserve biological diversity in a sustainable way. Despite the improved environmental knowledge no significant changes in trends of our life principles can be observed so far. As shown in the previous chapters just the pure knowledge without any effort to take action hardly contributes to a solution of our social, economic and political environment problems.

Considering the current situation scholastic and extracurricular environmental education is much more important than assumed. It is more important not only by teaching specialised knowledge but also for influencing pupil's attitude of value. In focus is that the personal attitude of value as well as knowledge will lead to take action. This requires a further development of teaching methods.



Fig B: To understand connects acting and recognition of relationships (Picture: Andreas Mühlbauer)

As a conclusion we can present following hints for scholastic and extracurricular environmental Education:

- develop practice-oriented learning situations which allow an acting use of knowledge,
- take students' conceptions into the classroom and discuss subjective theories
- promote the interest in nature by using an emotional access
- combine complex ecological relationships together with concrete ways of acting
- perform exploratory nature experiences outdoor
- promote ecological (risk-) awareness
- build an ethical value systems through discursive reflections
- create opportunities of acting for students,
- teach the effectiveness of their own actions
- use the increasing awareness of problems of pupils from the secondary high school level
- Implement nature conservation issues in schools
- Include parents in environmental education (attitudes and measures of their parents affect children)

7. The Significance of Emotions and Animals – The Basics of the „Tiere live“ Project

„Tiere live“ is concentrating on methods to open up access to nature for children and teenagers by using living animals. The encounter and interact with animals is great potential for successful environmental education which should not be wasted.



Fig. C: It is an emotional moment when a chick is hatching (Picture: Martin Schwab)

Gebhard supports this approach by taking up the importance of identification of children and teenagers with animals (GEBHARD 2009).

They can experience the threat of environment when animals get to role models. Gebhard notes further: "field trips, live experiments, observation, animal husbandry, experience the nature (...) are undoubtedly a condition that natural phenomena can be understood emotionally". (GEBHARD 2009, 191)

The emotional dismay for the loss of a personal nature experience is also seen as key to changing behaviour. In his study, Zahner is talking about sadness when the common quail is no longer talking in the fields or the first skylark or sterling is not returning in spring (ZAHNER 2007).

Both a direct contact and a direct experience with animals influence knowledge and attitudes positively (KLINGENBERG 2008, GEBHARD 2009). Systematically performed natural experiences (like explored and ecological experiences) are made to stimulate emotional inter-

est in nature as well as create an awareness of the hazards of nature (BÖGEHOLZ 2008 and 1999, LESKE & BÖGEHOLZ 2008).

Further study results show that an emotional, caring relationship can lead to a caring attitude to animals and to natural phenomena in general (Myers & Saunders 2002). Living animals are the best way to reach this. Further studies show that an emotional, caring relationship to animals can lead to a caring attitude in natural phenomenon in general (MYERS & SAUNDERS 2002)

Central Thesis:

- The direct examination of living animals is in the foreground of a holistic educational process: working with living animals combines emotions and action-oriented experiences and provides pupils with an active participation and identification.
- The relationship between risk, active protection measures and positive effects (also success) can be shown particularly conspicuous by using animals (e.g. amphibian protection at roads)
- A responsible handling of life in context of a (short- or long-term) animal husbandry affects the interpersonal skills and the ability to empathize positively. This opens up a currently under-utilized potential of education.
- Natural events are life events: In contrast, actions with living animals create a personal relation to our surrounding contemporary world instead of an abstract daily teaching practice. Even the "Diversity in front of our house" can be explored and discovered by simple actions.

8. Development of the „Tiere live“ Project

To implement Biodiversity in extracurricular education as well as in school classes practicable methods are one of the biggest necessities. This idea – which is called the “Tiere live” project – was born during a meeting of the Bavarian Academy for Nature Conservation and Landscape Management (ANL) and the “Akademie für Lehrerfortbildung und Personalführung in Dillingen” (ALP).

It was funded by the Bavarian State Ministry for the Environment and Public Health (BayStMUG) and the Bavarian State Ministry for Education and Cultural Affairs (BayStMUK).

A team of eight teachers and educationalists in the fields of environmental education this project was developed within two years. Furthermore many species specialists got involved. Now it is ready: the “Tiere live” handbook.

In our web presence

<http://dozenten.alp.dillingen.de/tiere-live/index.php/en> you can inform yourself about the „Tiere live“ project and the handbook. Furthermore you can establish contact to our specialists, visit the expert’s forum and take part at an online survey.

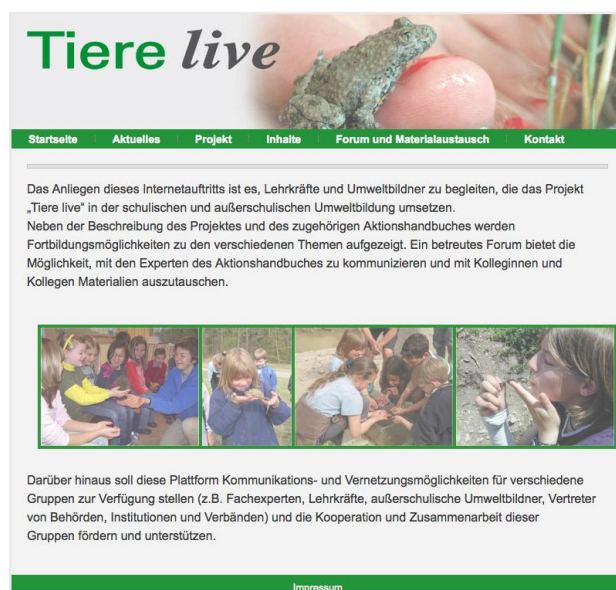


Fig E: Homepage of the “Tiere live” project

9. The „Tiere live“ Handbook

This handbook includes tried-and-tested methods focusing on living animals to mediate environmental education in school classes and extracurricular activities. More than 64 specific proposals on 12 animals (including animal husbandry and animal tracks) are collected in one folder. In the very beginning of each chapter a general overview shows all mentioned activities. This includes animals, title, a short description and the degree of difficulty of all activities. Suggestions of school level and season hints complete this overview.

All chapters include professional background knowledge, a selection of literature, web addresses and contact addresses of external contact persons. Furthermore it includes hints of legally aspects and how to handle with animals.

In the activity part detailed schemes are described how to implement activities in classes and which materials are needed. For each action the level of difficulty is mentioned and which season is the best.



Fig. F: Main page of the “Tiere live“ handbook

Primary objectives of this handbook:

- experience animals live in classes
- combine emotions together with action orientation
- show threat and conservation of animals
- promote a responsible use of animals
- get to know the diversity and value of animals
- recognize animals as a part of nature
- realize the value of Biodiversity
- reflect possible prejudice against animals
- teach how to deal with possible fears and feelings of disgust
- teach biological knowledge
- improve competence of assessment
- improve connected and systematic ways of thinking
- improve the structure of values

Those aims were fundamental guidelines to concept and create all activities of this handbook.

Action Guideline

- **Discover the diversity of your surroundings.** With actions that focus on diversity in the own surroundings, knowledge in species as well as an awareness of the local diversity can be trained. The "Tiere Live" determination pages were designed to determine animals simple and rapidly.
- **Take responsibility for life:** By actions with short-term or permanent animal husbandry the responsibility of pupils will be encouraged. Animals in the classroom or at school make it possible to get a vivid and lifelike knowledge acquisition.
- **"Sympathy animals" AND "antipathy animals":** In addition to the actions of popular animals "Tiere live" also suggest animals which are mostly occupied with little appreciation or negative images (e.g. snails or earthworms). Those activities give pupils an opportunity to learn how to deal with fear and disgust. They should learn to reflect their own actions and attitudes.
- **"Problem animals" in our society:** Some actions take up on socially controversial animals (e.g. beaver, raven, and wolf). Prejudices and conflicts of interest of various socially groups can be discussed and more on objective scientific information can be presented. These actions provide opportunities for pupils to form their opinion and evaluate those topics.
- **Feasibility in the (school) practice:** Ultimately, the project should be very easy to implement. Therefore, the handbook includes short activities for the classroom as well as excursions out into nature. We took care to connect this handbook to the curriculum and tried to support teachers and environmental educators by supporting materials. All actions have been checked for legal and health safety.

You can order this Handbook

at the "Bavarian Academy for Nature Conservation and Landscape Management (ANL)" (<http://www.anl.bayern.de/english/index.htm>; Your contact person is **Peter Sturm** peter.sturm@anl.bayern.de)

and at the "Akademie für Lehrerfortbildung und Personalführung" (www.alp.dillingen.de, your contact person is **Tanja Berthold**, t.berthold@alp.dillingen.de).

10. Perspectives

One of the educational main aims in Bavaria is to promote the responsibility for nature and environment (Guidelines for Environmental Education in Bavarian schools with reference to the Bavarian Constitutional Article 131 paragraph 2). In 2008 Bavaria's biodiversity strategy was established and contains more aims. Among others following is mentioned:

"The continuous increase in appreciation of local nature and intensification of the connection to the pupil's homeland. This will be achieved by increased training in biodiversity and species knowledge. "

"The preservation and use of biological diversity requires a social support. The importance of biodiversity is therefore anchored in scholastic and extracurricular environmental education. Efforts to further improvements should be made."

To reach this demanding aims it is inevitable to promote an education for a sustainable development. This should be fundamental in our education policy. It could help us to get an education system which is future-oriented and sustainable. To this end, there is a need to expand teacher's boundaries of ideas and there is also a need to increase substantially the financial resources.

The "Tiere live" project is a contribution to implement Bavaria's biodiversity strategy. As a further piece in the mosaic this project should help to reach the mentioned aims. It should encourage teachers and environmental educators to integrate living animals into their professional environment and their personal surroundings.

A careful and sustainable use of our environment, the awareness for the significance of biodiversity and the development of an ecological perception is a lifelong process. Therefore as individuals we can see the success of our efforts only in retrospect.

This shouldn't be a reason to lose engagement, courage and confidence. Our children are tomorrow's generation; every one of them is important!

References

- Bayerisches Staatministerium für Umwelt und Gesundheit (2009):** Strategie zum Erhalt der biologischen Vielfalt in Bayern, München, 2009, www.stmug.bayern.de
- Bögeholz, S.** (1999): Qualitäten primärer Naturerfahrung und ihr Zusammenhang mit Umweltwissen und Umwelthandeln. Opladen: Leske und Budrich
- Bögeholz, S.** (2004): Bewerten – Urteilen – Entscheiden im biologischen Kontext. Zeitschrift für Didaktik der Naturwissenschaften, Jahrgang 10, 2004, S. 89-116
- Brämer, R.** (2006): Natur obskur: Wie Jugendliche heute Natur erfahren. oekom München.
- Bundesamt für Naturschutz, Hrsg. (2009): Rote Liste gefährdeter Tiere, Pflanzen und Pilze Deutschlands. Band 1: Wirbeltiere. SchrR für Naturschutz und Biologische Vielfalt Heft 70 (1). Landwirtschaftsverlag, Münster.
- Brämer, R.** (2010): Natur: Vergessen? Erste Befunde des Jugendreports Natur 2010. www.natursoziologie.de (Stand: Juli 2010)
- Gebhard, U.** (2009): Kind und Natur. Die Bedeutung der Natur für die psychische Entwicklung. 3. Aufl. Verlag für Sozialwissenschaften, Wiesbaden.
- Klein, M.** (2007): Exkursionsdidaktik. Schneider Verlag, Hohenheim.
- Klingenberg, K.** (2008): Effects of „Primärerfahrung“ on Interests, Learning Climate and Attitudes: A comparative study with living animals and educational videos. ESERA-Summerschool; York (GB).
- Kuckartz, U., Rädiker S., Rheingans-Heintze, A.** (2006): Umweltbewusstsein in Deutschland 2006, Berlin
- Leske, S., Bögeholz, S.** (2008): Biologische Vielfalt regional und weltweit erhalten – Zur Bedeutung von Naturerfahrung, Interesse an Natur, Bewusstsein über deren Gefährdung und Verantwortung. In: Zeitschrift für Didaktik der Naturwissenschaften 2008 Jg.14: 167-184.
- Myers, O., Saunders, C.D.** (2002): Animals as Links toward Developing Caring Relationships with the Natural World. In: Kahn, P.H., Kellert, Jr., Kellert, S.R. (2002): Children and Nature. Psychological, Sociocultural, and Evolutionary Investigations. Cambridge, London.
- Spitzer, M.** (2008): Lernen – Gehirnforschung und die Schule des Lebens. Spektrum Akademischer Verlag, Heidelberg.
- Shell Deutschland Holding, Publisher** (2006): Jugend 2006. 15. Shell Jugendstudie. Fischer Verlag, Frankfurt.
- Wippermann, C.** (Projektleitung) (2009): Repräsentativumfrage zum Umweltbewusstsein und Umweltverhalten im Jahr 2008. Online-Version www.umweltbundesamt.de (Stand: Juli 2010)
- Zahner, V., S. Blaschke, P. Fehr, S. Herlein S, K. Krause, B. Lang & C. Schwab** (2007): Eine Studie zur Artenkenntnis bei Vögeln, durchgeführt mit bayerischen Schülern. Vogelwelt 128.

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