

Effective learning with the help of animals

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Abstract

International studies show that children, when asked to list different species, generally talk about animals that are not found in their own environment. Remarkable and extraordinary vertebrates, especially mammals, are mentioned whereas small animals (invertebrates and insects) are hardly ever discussed. An insufficient awareness of invertebrates seems to be culturally universal and can be found in different countries and continents. Experiential learning and a direct animal encounter are suggested as a means for a modern environmental education to address issues of biodiversity. In this study we assessed attitudes towards animals of 57 students before and after a presentation of living animals which was undertaken during their lessons. We compared the answers they gave in their questionnaires with those of 50 students from a control group. Results suggest that the presentation of animals leads to more positive attitudes towards the listed animals.

Introduction

Research indicates that children may be more and more separated from nature and have a low level of taxonomic literacy (Froebel and Schlumprecht, 2014 [1]; Louv, 2005 [2]). Furthermore, several studies have clearly shown that when asking children to list the animal-species they know, these children mainly mention remarkable and extraordinary vertebrates, especially mammals, whereas small animals (invertebrates and insects) are hardly ever listed (Drissner et al., 2013 [3]; Patrick et al., 2013 [4]; Snaddon et al., 2008 [5]). This identification of animals as mammals could have various reasons: mammals are usually larger and more often in the media, whereas the behaviour and the appearance of invertebrates seem to be strange and untypical for human beings (Lindemann-Matthies, 2006 [6]; Patrick et al. 2013 [4]; Piper, 2014 [7]). Very worrying is the reason that children sometimes are not sure if invertebrates are animals (Patrick et al., 2013 [4]). Worse still, the small animals are often associated with negative emotions. Transnationally, animal-species could be categorised as fear-irrelevant, fear-relevant and disgust-relevant species (Davey et al., 1998 [8]). These negative emotions towards small animals (of which the majority is harmless and necessary for our own ecological system, see Wilson, 1987) pose a genuine obstacle for an effective ecological education (Bixler et al, 1999) or education in sustainable development. Moreover, if children are not familiar with the animals they encounter in their own natural environment, they will find it difficult to address issues of biodiversity and ecological problems (Weilbacher, 1993; Heywood, 1995).

One should keep in mind that many animal-species are rare and classified as endangered species; the extinction of species has been dramatically accelerating, and it is difficult to predict the outcome (Rockström et al., 2007 [9]). Especially animals could be a suitable and important instrument, a vehicle so to speak, to create a consciousness for the worth and importance of the environment, because children are aware of animals (Patrick et al., 2013 [4]). Scientists point to the danger that certain animal-species could disappear from people 's consciousness before they are actually physically endangered (Fawcett, 2002 [10]). A direct animal encounter is suggested as a means for a modern environmental education to address issues of biodiversity (Drissner et al., 2010).

Materials and Methods

Therefore, we assessed attitudes towards animals of 57 students before and after a presentation of living animals which was undertaken during their lessons. The following species were presented: Madagascar hissing cockroach (*Gromphadorhina portentosa*), giant millipede (*Archispirostreptus gigas*), African giant snail (*Achatina achatina*), Chilean fire tarantula (*Grammostola rosea*), dumpy tree frog (*Litoria caerulea*), bearded dragon (*Pogona vitticeps*), royal python (*Python regius*). We compared the answers they gave in their questionnaires (see Table 1) with those of 50 students from a control group (no presentation). Attitudes towards presented animals were recorded with the help of a semantic differential (Snider & Osgood, 1969). Students were asked to choose where their position lies on a scale between two bipolar adjectives (for example: "Boring - Fascinating",

"Useless - Valuable" or "Disgusting - Cute"). Altogether students marked their choice for 13 bipolar adjective pairs that focused on the perceived value of animals and the emotions towards them (e.g. fear and disgust).

Procedure. Students of the intervention group completed the questionnaire to obtain a baseline level of their attitudes between 5 and 7 days before the presentation of the living animals. Students of the control group completed the identical questionnaire at the same time. Over the next 5 to 7 days, students in both the intervention as well as the control group completed the questionnaires for the second time as a follow-up measure.

Results and Conclusion

The intervention group (with animal presentation) showed a significant improvement on eleven of the 13 bipolar attitudes. After the presentation of the animals the students rated these animals for example more fascinating and interesting, cuter, better, cooler, more harmless and more precious than before (see Table 2). While intention of the setting was to bring about such differences, it cannot be taken for granted that the experience with the presented animals must necessarily bring about these positive changes. An educational programme that helps to improve the attitudes and the emotions towards various animals is very important in light of the increasingly smaller number of children estimating the value of different animal-species correctly (Lindemann-Matthies, 2006 [6]; Snaddon et al., 2008 [5]; Wagler and Wagler, 2011 [11]). These results support a previous study with students who visited a "Zoo-School": learning in the "Zoo School" is organised in such a way that students have the possibility to encounter, touch and handle different animals (e.g. corn snake, dumpy tree frog, central bearded dragon, stick insect, giant millipede), and what they observe will be explained and put into context. In this study 210 secondary students, 108 who had visited the "Zoo School" before (intervention group), were asked to write an essay about vertebrates and invertebrates. The instruction given was: "What do you know about the vertebrates and invertebrates? Please describe." 102 students from the parallel classes (same school, same grade) served as control group. The students who visited the "Zoo School" wrote more scientifically correct statements, showed better knowledge of and more positive emotions towards vertebrates and invertebrates than the control group (Drissner et al., 2014 [12]).

We can only miss a species if we have had some kind of attachment to it (Weilbacher, 1993; Lindemann-Matthies, 2002). Precise knowledge about the biology and ecology of living creatures is especially important in order to create an emotional bond with plants and animals as well as to foster appreciation for the environment (Mayer, 1993). Furthermore, biology lessons can be made more enjoyable by studying living plants and animals first-hand (Lock, 1998; Barker, 2002). Winkel, a pioneer of environmental education, emphasized the importance of an emotional encounter with living creatures to promote environmental ethics even before the importance of sustainable development was discussed. He stated that the behaviour of human beings was only partially determined by knowledge, and that values, conscience and morale played an equally important role. While values and feelings cannot develop without knowledge, taking or avoiding action, caring for something and adopting a gentle approach are inspired by feelings that come from within – from the heart, so to speak (Winkel, 1995).

The positive results noted in the intervention group but not in the control group support above-mentioned studies and findings. Furthermore the results of our study are remarkable considering the duration of the program (needs about two hours). This is extremely short-term participation. Such effective, short-term programs can be easily integrated into the curricula and they can be reflected accordingly by the students within the classroom setting. As pedagogical approaches and curricula are created the just mentioned ideas should be considered.

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