

**Proceedings of Tourism and Public Awareness of Man-Nature Relations**  
International Conference, November 17.-19. 2014, Flensburg, Germany

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## Table of contents

- Preface - Claus Michelsen
- Tourism & Environmental Awareness - Stefan Gössling
- The unused potential of natural history museums in Denmark - Tammes Scheurer
- PHYSIKWUNDERTÜTEN - a measure for long-term promotion of teenagers' interest in physics!?! - Kevin Kolanowski
- The task of the teacher in out of school activities - Trine Hyllested
- Self-development and human potential (flourishing) through tourism - Scott McCabe  
Conference program
- List of participants

## Preface

*Professor and Project Manager of TMN Claus Michelsen, University of Southern Denmark*

The project 'TMN-Tourism, Man, Nature' arranged November 17.-19. 2014 the international conference 'Tourism and Public Awareness of Man-Nature Relations' at Phänomenta in Flensburg, Germany.

The theme of the conference was man-nature relations in the context of tourism, science-centers and public understanding of science, and the conference brought together 23 participants from UK, Sweden, Germany and Denmark. The conference aimed to create a favorable setting to bring together science-centre professionals, researchers in tourism, and researchers in science education and communication.

The conference program comprised two plenary lectures by two invited experts, Professor in Tourism Research at Linnaeus University and in Human Ecology at Lund University Stefan Grössling and Associate Professor in Tourism Management/Marketing at Nottingham University Business School Scott McCabe, nine presentations of projects related to the conference theme, launching of the TMN book "Footsteps of science – experiences in Southern Denmark og Schleswig-Holstein with learning outcome" and a debate centered on the question: Can tourism help raising public awareness of man-nature and improve interest in science?

The conference demonstrated a vivid active field of interest in research and development in value based tourism and science communication. This volume contains abstracts and presentations from the invited experts and a selection of the submitted contributions to the conference. The volume mirrors the dynamic and interdisciplinary atmosphere of the conference, and provides knowledge and insight from different positions about the role of science centers and tourism in raising public awareness of science.

The organizers would like to thank all the participants of the conference for their attendance and the presentation of their work, and we hope this volume will be a positive contribution to those working within the field of science communication.

The project 'TMN-Tourism, Man, Nature' is supported by a grant from the program 'INTERREG 4 A Syddanmark-Schleswig-K.E.R.N' with the objective to position the Interreg region of Southern Denmark, Schleswig-K.E.R.N. as a modern holiday destination and through tourism promote a broad public understanding of the importance of the relations between man and the surrounding nature. The project the partners University of Southern Denmark, Europa-Universität Flensburg, Christian-Albrechts-Universität zu Kiel, Naturama (Svendborg), Fjord & Bælt (Kerteminde), Phänomenta (Flensburg), Multimar Wattforum (Tönning) and Tierpark Arche Warder (Warder).

## **Tourism & Environmental Awareness**

*Professor Stefan Gössling, Linnaeus University and Lund University*

The presentation discusses current patterns of global resource consumption in tourism for energy, water, land, food, and illustrates how resource use, as well as emissions of greenhouse gases, the creation of solid waste, and tourism's impact on biodiversity will grow in the future. Results suggest that a massive awareness campaign is needed to improve human-environmental relations, and to initiate a decline in resource consumption on the basis of behavioural change. The presentation outlines pathways for such a knowledge campaigns based on the examples of carbon labelling (energy/emissions), towel reuse (water), and food purchases and presentation (various environmental impacts). It suggests that awareness and knowledge management in tourism have received very limited attention, even though tourism holds considerable potential to become a "force for good".

# The unused potential of natural history museums in Denmark.

Tammes Scheurer, University of Southern Denmark

This text is a summary of a presentation held in Flensburg at Phaenomena in November 2014.

The definition “museum” is here limited to those institutions which by the state of Denmark are recognized as such, and thereby fulfill the requirement of collecting, registering, preserving, researching and communicating (museumsloven, 2006). While the term “museum” is often used more broadly (Falk & Dierking, 2013) and the issue of lacking high school visitors likely isn't limited to those institutions that by the state of Denmark are recognized as museums, data on the issue is only readily available from these “museums”.

The presentation addressed the fact that Danish natural history museums (and museums in general) see a low number of high school visitations. The Danish agency for culture heritage (Kulturarvstyrelsen) made it a point in its report in 2008, that this trend should be addressed as an issue that should be solved (Lundgaard, 2008).

To investigate visitor motivation for making trips to museums the Danish agency for culture has made it a requirement for museums to handout special designed questionnaires that employ John Falk's idea of motivational roles (Lundgaard & Jensen, 2013; Lundgaard, Jensen, & Foldgast, 2013). However when it comes to investigating the lack of high school visits several issues arise with this approach, the two main concerns being:

- 1) The limited number of high school visits results in a low number of questionnaires that are being filled out
- 2) High school visits are primarily instigated by the teacher

The later of these two issues does raise the question if students have a negative attitude towards the idea of visiting a natural history museum during school hours in the first place. Preliminary research suggests that this however is not the case and that a high percentage of high school students in biology classes (at least) seems to be positive towards the idea of using natural history museums more during their biology lectures.

The question however remains: what is keeping high school visitations from happening at museums?

During the presentation it was suggested that three general concerns prevent high school teachers from using museums more in their teachings:

- 1) Visits' lack of alignment with the curriculum
- 2) High entry fees
- 3) Museums being too far away

Two solutions already used by some museums were presented, where the issue the solution tried to solve varied. The presented solution where:

**Star lectures:** Where publicly recognized scientists/speakers gave lectures (for free) on themes that to some extent aligned with the curriculum.

**Museum visits to the high school:** In this scenario the museum visits the high school offering a presentation often with a few objects that can be studied by the students along with some assignments, thereby removing the issue of transportation and the museum being too far away

While these issues indeed do offer services to high schools that seem to be well received, it was argued that the previously mentioned teacher concerns might be aspects of a bigger problem: that the workload on the teacher for arranging a visit might be too demanding.

To solve this problem a solution was presented as the "LLC-model" (life learning center-model) based on a model used by the Life Learning Center in Bologna Italy. In its essence the LLC is a summer school in form of a science camp, but created in a way that creates as low a workload on the teacher as possible.

All three concerns mentioned by high school teachers in Denmark were addressed to some extent by this model. Since the visits were held outside school hours, this was seen as a supplement to the curriculum, not a required representation of it. There were no entry fees forced upon the high school as the expenses were mostly covered by the foundation running the LLC. Being outside school hours and offering lodgings during the stay the LLC-model did not seem to have issues with distance.

However a few issues with the LLC-model were mentioned during the presentation. As the LLC-model is a summer school held outside regular school hours only highly motivated students showed up, in most cases only representing a few individuals from each class offered the LLC-model. Furthermore the expenses associated with the LLC-model are high for the institution offering it, as everything except transport (which is completely funded by the students). At the end of the presentation the LLC-model was listed as a potential (but expensive) method for furthering the use of Danish natural history museums by Danish high school students.

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# **PHYSIKWUNDERTÜTEN - a measure for long-term promotion of teenagers' interest in physics!?**

*Kevin Kolanowski, Flensburg University*

## **"PHYSIKWUNDERTÜTEN" - a measure for long-term promotion of teenagers' interest in physics**

The Europe University Flensburg has developed a measure called „PHYSIKWUNDERTÜTEN“, whose goal is to promote the interest in physics of teenage visitors of Phänomenta Flensburg in the long term. The PHYSIKWUNDERTÜTEN are surprise bags, which contain instructions and materials for simple physical experiments regarding the topics mechanics, thermodynamics, magnetism, electricity, optics and acoustic. It is planned to provide the PHYSIKWUNDERTÜTEN within a free monthly subscription that follows on the visit of Phänomenta. In this way, the participating teenagers get the opportunity to continue dealing with physics at home. The program is aimed at private teenage visitors as well as science classes, who come to Phänomenta. The theoretical foundation of the measure is the Four-Phase-Model of Interest Development from Hidi and Renninger (2006), which suggests the promotion of interest development through the arrangement of frequent interest triggering situations.

Before the measure and the accompanying research can be implemented, it required some preliminary investigations. On the one had to be checked whether the PHYSIKWUNDERTÜTEN materials are suitable for the intended purpose and target group. On the other it required a revision of the survey instrument (questionnaire), which will be used within the accompanying research.

Upon completion of the preinvestigations further steps for preparing the main study had to be realized, such as the concretization of the study design and the recruitment of subjects. In the following, the mentioned activities are specified.

### **Evaluation of the „PHYSIKWUNDERTÜTEN“ materials**

The evaluation of the PHYSIKWUNDERTÜTEN materials has been realized with the involvement of 47 pupils (7th and 8th grade) of a school center from Schleswig-Holstein. After their visit of the Phänomenta they were handed over PHYSIKWUNDERTÜTEN (one per pupil) and asked to use the materials they contain at home and to evaluate these in the attached questionnaire. The main variables of the questionnaire referred to the aspects difficulties, amazement, understanding and enjoyment while using the PHYSIKWUNDERTÜTEN. The results of the study have shown that the materials are generally suitable for the intended purpose and target group. However there was a quite low participation rate (51.1 %), which indicates that the implementation of the PHYSIKWUNDERTÜTEN program in the main study should be done in another as the tested way. Conceptual anchor of the adjustment could be the creation of more obligatoriness with regard to the active participation in the PHYSIKWUNDERTÜTEN program. Based on these results both the materials and the concept of PHYSIKWUNDERTÜTEN program have been revised.



### Revision of the survey instrument (questionnaire)

The questionnaire, which will be used for assessing the effects of the PHYSIKWUNDERTÜTEN program, consists of six scales that measure different aspects of interest in physics. It involves item sets that have been developed by various German research institutions and used in several large-scale studies. In order to verify the scientific quality of the questionnaire, it has been tested with 125 pupils (7th and 8th grade) from Flensburg and subsequently analyzed. Therefor the following statistical methods were used: Calculation of the difficulty indices, selectivity coefficients and homogeneity indices as well as the performance of factor analyses. Based on the results the questionnaire was revised (removal of 4 items) and thus prepared for the use in the planned main study.

### Concretization of the research design of the main study

The main study is designed as a longitudinal study with three study groups and two survey waves (pre- and post-test). The aforementioned questionnaire will be used for the data collection. As shown in the table below the experimental groups differ in the kind of their treatments, that means, the two groups will receive two different intervention types. In this way, the effects of the two variants can be compared. In addition, a control group is used, which functions as a baseline. This allows control of various confounding variables, such as development and testing effects.

	Pretest	Treatment Type 1 (Visit of Phänomena + PWT subscription)	Treatment Type 2 (Visit of Phänomena without PWT subscri.)	Posttest
Experimental Group 1	Participation	Participation	No Participation	Participation
Experimental Group 2	Participation	No Participation	Participation	Participation
Control Group	Participation	No Participation	No Participation	Participation

 Participation       No Participation

### Implementation of the “PHYSIKWUNDERTÜTEN” program within the main study

The calculation of the required sample size has shown that at least 120 subjects are needed per study group, what means, that the total sample must not be less than N=360 to ensure significant results.

In order to recruit the subjects 13 grammar schools in the catchment area of Phänomena were invited to participate in the PHYSIKWUNDERTÜTEN program. Due to the small number of feedback the schools were invited again after four weeks. Despite these efforts only three schools responded to the invitations until the end of the year. Against this backdrop, the start of the study had to be postponed to 2015.

## **Animals in captivity - why do we need them?**

*Lars Seidelin, Fjord&Bælt*

Animals in captivity has always been open to discussion . The presentation is based on whether or not these discussions are guided by factual arguments or at subjective feelings. The presentation will address different reasons for keeping animals in captivity based on the animals at Fjord & Bælt - and the reasons for having these animals.

Copenhagen Zoo killed in 2014 giraffe Marius , which create media storm in Denmark and abroad . This discussion attempted Copenhagen Zoo to nuance with factual arguments, while the media and parts of public attitudes seem guided by emotion. One purpose of the presentation ' Animals in captivity - why do we need them? ' Has been to focus on some of the mechanisms that exist in such discussions.

## **The task of the teacher in out of school activities.**

*Trine Hyllested, University College Lillebælt*

Plutarch, a Greek philosopher (year 46 – 120 a.d.), has been quoted for saying: *The correct analogy for the mind is not a vessel that needs filling, but wood that needs igniting.* In this proceeding it is discussed how to "ignite the wood". There are many ways of doing that.

### **Conditions**

First of all it is important to underline that the presentation is focused on how out-of-school environments could be a media of learning in formal education. This proceeding is focused on the connection to the formal curriculum. It is acknowledged that out-of-school environments have a lot of other very good possibilities.

### **The research questions, which are examined from data:**

Why did teachers use the out-of-school-activities? In which ways did teachers act, when they met the expert-interpreters? The task of the teachers (and the professional centre), when using out-of-school-activities as resources for learning?

### **The methods used:**

Observations, interviews, data collection, surveys, action research through a period from 2002-2012. The collected data were from museums in the southern region of Denmark, Danfoss Universe, a nature center of Copenhagen, the Planetarium in Copenhagen, Copenhagen Zoological Garden, Experimentarium, Historical Archaeological Research Center in Lejre.

### **Definition of an out-of-school environment:**

An out-of-school environment is defined as a physical locality which is characterized by concrete objects or installations and a presentation of a certain message or subject area. Often there are professional and skilled interpreters teaching and often there are "hands on activities".

### **CARPE DIEM - Use the actual and local possibilities:**

An example from a local activity: 32 classes were visiting excavations for a motorway during a period of about a month. They excavated just as archaeologists, but in the discarded trenches from the real archaeologists. Three of the classes chose to exhibit their findings side by side of the findings from the archaeologists at the local museum.

### **What is the purpose of working with out-of-school environments?**

It gives the students the opportunity of physical contact with special objects. It gives the students a common experience and new ways of working. It gives some students the challenge of new settings and new professional authorities.

### **Which possibilities of learning is a visit to an "out-of-school- environment" not able to create ?**

An experience in itself does not create knowledge. Dialogue and reflection do not come by itself. Activities in out-of-school environments can be like "Educational MacDonalds" without relations to curriculum or society (Bradburne 1998). Special types of learning will be favoured, when going out of school.

### **The out-of-school session is a scene with different actors**

The teacher, the student and the interpreter of the museum or the science centre.

The teacher has a formal agenda to follow the law and teach the children. But they also have an unformal agenda. The teacher wants to learn something new themselves, get some in-service training and have a good time together with their students. It is easy to use readymade teaching.

The student wants to try something else, experience new things. They are also uncertain: What is going to happen? Where is the toilet? When are we going to eat? Perhaps they do not bother about the difference between a "Sunday-visit" with mum and dad and a "Visit with the school", so they have to be guided.

The interpreter has an idealistic agenda. It is important to work with knowledge about our culture. The earlier culture and the culture from today are the fundament for building a new culture. It is important to teach young students to recruit new scientists, new historians and so on. But the interpreter also has an agenda of keeping up their own job. The school session is a branding of the place, the science center or the museum. It is a way of creating legitimacy and secures the existence of the place.

### **The cooperation between the teacher and the interpreter**

In the "object lessons" around year 1900 the local teacher went outside with his class. Today he or she uses a professional knowledge center - with experts - to a special produced arrangement. The teacher has a difficult role here. He or she is working in an area where it is difficult to define the roles of the teacher and the role of the interpreter. Some of the teachers act like a practical help, establish social fellowships or work like a "Law and Order"-worker. Some teachers more act like tourists (relaxing and enjoying) and very few of the teachers see themselves as facilitator of learning processes.

### **The aim of the visit**

The interesting thing to discuss is the aim of the visit. Should it be a media of learning or should it be a goal in itself? How do we work together about this? What is the difference between planning events and planning learning processes? Teachers and interpreters working with genuine learning processes were conscious of the goal of the excursion - before, under and after. They involved the students in relevant decisions and dialogues. They required the students to do practical work, products, presentations and facilitated evaluation after the excursion.

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## Exploring the relationships between education and self-development through tourism.

*Professor Scott McCabe, Nottingham University Business School*

Instinctively tourism experience can be linked to positive outcomes for individuals. Life is a journey, and journeys give meaning to life. Travel broadens the mind, opening up new horizons especially for certain groups of people / types of consumers and for individuals at the developmental stage of the lifecycle, children and young people. However, until relatively recently, the potential role of tourism in contributing to self-development and learning has been neglected, outside of the context of educational travel. Separate strands of tourism research have examined the links between tourism and skill acquisition, motivations of knowledge and learning, and outcomes of 'self'-development, yet there is little sense of how these literatures are connected.

Educational travel can be framed as tourism that provides a context for learning, in that school tours or study tours are sometimes linked to the subject curriculum for geography, history, area studies, classics, sports, language studies, or even tourism studies! Travel to various destinations can help to situate the curriculum and bring the curriculum to life.

Learning can also be a motivator for travel. We may chose destinations and forms of tourism that satisfy our curiosity or thirst for knowledge about cultures, wildlife and naturalism, which enhances our skills (think of tourists who are motivated by learning about classical Greece by travelling to the country and visiting heritage attractions). We might also think about tourism to the Galapagos or Antarctica to watch wildlife, or companies such as 'Go Learn' offering Flamenco and Spanish classes in the context of homestays, which lead to skills and learning and satisfy social and cultural needs.

Tourism learning can be considered as a type of Aristotelean Lifelong Learning, the recognition of both informal and formal learning; the importance of self-motivated learning; an emphasis on self-funded learning; and the idea that participation in learning should be universal (Falk, Ballantyne, Packer, Benckendorff 2012). Tourism learning can also be linked to notions of 'Experiential Learning' (Kolb 1976) since tourism is an experience which requires adaption to the changing environments in which we find ourselves. Finally, tourism learning can be unplanned (Minnaert 2014), relating to the unmotivated learning that comes from intercultural interactions for example.

I would like to propose that we also consider the concept of 'learning through tourism' which refers to the processes of self-reflection which often occurs through tourism (having time free from social norms and everyday obligations, and free choice - self-determination - to think about oneself and ones goals in the context of a new environment, which enables a re-evaluation and reflexion of the self. This relates to the potential for tourism to lead to more substantial life changes, self-development or transformation. The presentation explores the social psychological literature on outcomes of travel, drawing on a range of examples from empirical studies to show how tourism experiences can lead to human 'flourishing' – eudaemonic wellbeing. The presentation addresses the implications for policy makers and practitioners, particularly in relation to those groups who are excluded from tourism opportunities.

## **Noise pollution - a problem for marine mammals. An example, how expeditions boxes and teacher trainings can enhance the attractiveness of school labs and science centers.**

Katharina Witte & Katrin Knickmeier, Kieler Forschungswerkstatt, CAU Kiel

*Nature Relations* from November 17<sup>th</sup> to November 19<sup>th</sup> 2014 in Phänomenta Flensburg  
Interreg Iva-project "Tourism-Human-Nature"

### **An example how expedition boxes and teacher trainings can enhance the attractiveness of school labs and science centers and raise awareness for noise pollution - a problem for marine mammals.**

The "Kieler Forschungswerkstatt" is a school lab which developed in the frame of a cooperation between the Leibniz Institute for Natural Science and Mathematics Education (IPN) Kiel and the Christian-Albrechts-University of Kiel along with several other partners in and outside of the University. The school lab opened in October 2012. Since then, different topic-related labs developed, such as the ocean:lab, the geo:lab, zoom:lab, energy:lab and klick:lab.

The target is that students learn more about scientific working processes and how research results are generated by attending the different labs and working on numerous experiments. The experiences gathered in the labs are designed to build a complementary knowledge to what students learn in schools. Topics presented in the "Forschungswerkstatt" are closely linked to recent research projects, clusters and study programs at the University of Kiel. The school lab intends to support students of all backgrounds as well as specially gifted individual students from grade 3 to 13. Furthermore, the visit to the school lab and participation in experiments shall raise awareness and interest in recent research topics. Another target is the implementation of this facility and its activities into the study programs of teachers to be and advanced trainings for teachers already on duty.

**In order to fulfill these targets in the field of marine sciences, we asked ourselves the following question:**

#### **How can we use the example of marine mammals to enhance the attractiveness of Science?**

The answer we came up with is that marine mammals are very popular among people of all age classes and can help enhance the attractiveness of Science topics because:

- Marine mammal science involves numerous disciplines, such as biology, ecology, physics, mathematics etc.
- Marine mammals are easy to relate to, because they are mammals and breath through lungs, which makes their appearance more similar to humans than many other marine animals
- Are key species in the ocean; their health state can provide valuable information on environmental pollution/ show anthropogenic influences.

**The next question we asked was: By which means can we enhance the attractiveness of school labs and science centers?**

One conclusion is that students and teachers have to be given the opportunity to do practical work on the topics we want to raise awareness for. Therefore, the Kieler Forschungswerkstatt developed several expedition boxes with equipment, e.g. for the topic “senses of whales” for making acoustic recordings with a hydrophone under water and analyze the data later.

Furthermore, teachers are given the opportunity to attend special trainings (with teaching material for complementing the arrangement of their natural science classes.

Contents of the box and the teaching materials are used as an exhibition module, as a teaching unit for school classes who visit the Kieler Forschungswerkstatt and for an expedition box which can be borrowed by school classes. Additionally, there is a hearing quiz on noise pollution in oceans conducted at the end of each session. An additional module is about to be integrated into this unit in February 2015. The unit is about underwater acoustics and sound reduction under water in connection with offshore pile-driving.

The current structure of the acoustic learning unit for school classes from grade 5 to 13 is structured as follows:

- experiencing own sense of hearing through experiments
- answering some questions on acoustics related to experiments
- learning something about harbor porpoises, their sense of hearing and the problem of underwater noise pollution
- experiencing hearing under water with a hydrophone
- completing a hearing quiz
- taking written material back home

The existing materials and experiments have not been evaluated yet, which provides several opportunities for interesting topics for bachelor or master theses in the field of didactics of natural sciences.

Several individual student project works have been supported by the Kieler Forschungswerkstatt so far, e.g. a project work with hydrophone measurements in Kiel Fjord about “Understanding sounds and learning about noise pollution in the ocean and its effects on marine mammals”, as well as “Learning about the biology and ecology of harbor porpoises” including a dissection of dead stranded harbor porpoises at the Institute for Terrestrial and Aquatic Wildlife Research (ITAW) Büsum.

The overall target of these measures is to motivate students to study in the field of natural sciences to protect marine mammals/ the environment in general. Whether the offered programs and measures of the school lab fulfill this target, should be subject of further studies, surveys and investigations.

Main subject of the acoustic learning unit is noise pollution under water, its origins and its effects on indigenous marine mammal species, especially the harbor porpoise. The latter is the only whale species, which lives in higher numbers in the German and Danish North and Baltic Sea coastal areas and reproduces there. Most important sense for harbor porpoises is echolocation



(combination of sound emission by echolocation clicks and receiving of specific echos in the inner ear) which is used for the determination of prey, predators, barriers, and for navigation and communication. So instead of using their eyes, harbor porpoises “see” with their ears. Therefore, intact ears are essential for their survival. Sources of noise under water with anthropogenic origin can be health and life-threatening for harbor porpoises, such as sonars, pile-driving of offshore-windfarms into the sea floor, ship traffic, extraction of oil and gas and many more. Consequences can be “masking” of communication of harbor porpoises, collision with ships or strandings which end deadly for most of the harbor porpoises. Underwater noise can lead to temporary or permanent impairment of hearing in harbor porpoises and can even cause complete loss of the hearing sense. Underwater explosions or sonars can evidentially cause direct or indirect death of whales (Richardson et al., 1995; Fernandez et al., 2004). Anthropogenic noise pollution under water is assumed to increase in the future. Therefore, scientists from the Foundation for Veterinary Science Hannover (Institute for Terrestrial and Aquatic Wildlife Research Büsum) are conducting research on methods of sound emission reduction under water.

## Conference program

### Monday - November 17

14:30-15:00 Registration, coffee/tea

15:00-15:30 Opening:

- Chairman of Flensburg Town Council Swetlana Krätzschar
- Director of Phänomenta Achim Englert
- Project Manager Professor Claus Michelsen, University of Southern Denmark

15:45-17:15 Plenary talk by Professor Stefan Gössling, Linnaeus University & Lund University

17:30 Reception at Phänomenta

### Tuesday – November 18

09:30-11:00 Presentations:

- 1a: The Wadden Sea World Heritage: Approaches in Environmental Education. Claus von Hoerschelmann, Nationalparkzentrum Multimar Wattforum
- 1b: The unused potential of natural history museums in Denmark. Tammes Scheurer, University of Southern Denmark
- 1c: PHYSIKWUNDERTÜTEN - a measure for long-term promotion of teenagers' interest in physics!? Kevin Kolanowski, Flensburg University

11:00-11:30 Coffee/tea

11:30-13:00 Presentations

- 2a: Animals in captivity - why do we need them? Lars Seidelin, Fjord&Bælt
- 2b: The importance of domestic animal parks for the conservation of agro biodiversity. Dr. Kai Frölich, Arche Warder
- 2c: The task of the teacher in out of school activities. Trine Hyllested, University College Lillebælt

13:00-14:00 Lunch

14:00-15:00 Presentation of TMN tourism and science book project:

Launching of the book "Footsteps of science – experiences in Southern Denmark and Schleswig-Holstein with learning outcome" published by the TMN projects. The book presents a series of narratives dealing with the relations between man and the surrounding nature. The narratives are related to destinations in Southern Denmark and Schleswig-Holstein and invite to tourism experiences with authentic content, activities and personal enrichment.

15:00-15:30 Coffee/tea

15:30-16:30 Debate: Can tourism help raising public awareness of man-nature and improve interest in science?

The debate is chaired by Professor Claus Michelsen and opened by a panel of experts:

- Director Achim Englert, Phänomenta
- Assistant professor Morten Rask Petersen, University of Southern Denmark
- CFO Torben Kylling Petersen, Universe

19:00 Conference dinner at restaurant in Flensburg

### Wednesday – November 19

09:30-11:00 Plenary talk by Professor Scott McCabe, Nottingham University

11:00-11:30 Coffee/tea

11:30-13:00 Presentations

- 3a: Mathematics at the arts and design museum Trapholt, learning perspectives on arts and discipline. Mie Engelbert Jensen, University College Syddanmark

- 3b: Noise pollution - a problem for marine mammals. An example, how expeditions boxes and teacher trainings can enhance the attractiveness of school labs and science centers. Katharina Witte & Katrin Knickmeier, Kieler Forschungswerkstatt, CAU Kiel.
- 3c: Learning about the impact of climate change on our marine environment through experiments Arne Bockwoldt, Flensburg University

13:00-14:00 Lunch, closing

### List of participants

- Linda Ahrenkiel, University of Southern Denmark
- Catrin Anrich, Phänomenta Flensburg
- Arne Bockwoldt, Flensburg University
- Andreas Christian, Flensburg University
- Achim Englert, Phänomenta Flensburg
- Kai Frölich, Arche Warder (Tuesday)
- Stefan Gössling, Lund University (Monday)
- Guido Hanslik, Phänomenta Flensburg
- Claus von Hoerschelmann, Nationalparkzentrum Multimar Wattforum
- Trine Hyllested, University College Lillebaelt
- Mie Engelbert Jensen, University College Syddanmark (Wednesday)
- Katrin Knickmeier, Kieler Forschungswerkstatt, Christian-Albrechts-Universität zu Kiel
- Kevin Kolanowski, Flensburg University
- Stefanie Klingel, Arche Warder
- Scott McCabe, Nottingham University
- Claus Michelsen, University of Southern Denmark
- Wolfgang Muth, Phänomenta Flensburg
- Torben Kylling Petersen, Universe
- Morten Rask Petersen, University of Southern Denmark
- Heike Rudolph, Arche Warder
- Tammes Scheurer, University of Southern Denmark
- Lars Seidelin, Fjord&Bælt
- Katharina Witte, Kieler Forschungswerkstatt, Christian-Albrechts-Universität zu Kiel



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