



# 1<sup>st</sup> International Conference Interdisciplinary Research on Museums as Informal Learning Spaces – New Ways and Concepts

18-19 December 2019, Berlin

Programme  
Profiles &  
Abstracts

Die Forschungsmuseen der

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# Foreword

Museums are central places of knowledge preservation and research. At the same time – and some may say primarily – museums are spaces in which this knowledge can be transferred, mediated and shared. They have the potential to act as a hub of public dialogue in which a public that progressively relies on fact-based and discursive knowledge has the opportunity to find insights, develop their own ideas and encounter people who challenge their set view of the world. Yet why and what people learn at the museum, whether and how they interact with the exhibition space is still quite unknown.

Therefore, this conference deals explicitly with the museum as an informal learning space. Researchers from all over the world will discuss questions such as:

Which skills do visitors bring to the museum?

Why do they decide to go to a museum in the first place?

And who does not visit museums?

Finally, all these questions aim to develop the museum into a location where people are invited to participate in enhancing our knowledge about the world.

**Univ.-Prof. Alexandra W. Busch**

General Director

Römisch-Germanisches Zentralmuseum

Leibniz-Forschungsinstitut für Archäologie

**Prof. Dr. Olaf Köller**

Managing Director of Research

IPN – Leibniz Institute for Science and Mathematics Education

Department of Educational Research and Educational Psychology

# Scientific Programme 18<sup>th</sup> December 2019

12:30-13:00 **Welcome and Introduction**

Alexandra W. Busch and Olaf Köller

13:00-13:40 **Keynote: Social Interaction, Museum Learning and the 'Age of Participation'**

Graham Black (Nottingham Trent University)

**Panel I: Identifying Learning Outcomes – Goals, Challenges and Chances**

14:00-16:00 **Chair:** Johannes Vogel (MfN, Berlin)

14:00-14:30 **Making Sense of Sensemaking: Creative Learning in Semi-formal Settings**

Kirsten Drotner (University of Southern Denmark)

14:30-15:00 **Unpacking the Museum: Learning and Participatory Strategies as Motors in Meaning Making and Relevancy**

Léontine Meijer-van Mensch (State Ethnographical Collections of Saxony)

15:00-15:30 **Audience Research and Evaluations at a City Museum and at a Natural History Museum from the Perspective of Museum Management and Museum Communication**

Tobias Nettke (University of Applied Science, Berlin)

15:30-16:00 **General Discussion**

16:00-16:30 **Coffee Break**

**Panel II: Museum Literacy**

16:30-18:30 **Chair:** Doris Lewalter (Technical University Munich)

16:30-17:00 **Prerequisites for the Use of Exhibitions – A First Approximation Using a Delphi Study**

Lorenz Kampschulte (Deutsches Museum, Munich)

17:00-17:30 **Reaching beyond the Choir: Broadening Participation in Museums through Inclusive Practices**

Martin Storksdieck and Jill Stein (Oregon State University)

17:30-18:00 **Flying Ships and Talking Exhibits – About Playful Experiences in Museums**

Thomas Lilge (Humboldt University, Berlin)

18:00-18:30 **General Discussion**

18:30-18:45 **Summary of Day 1**

19:30 **Dinner** (Museum für Naturkunde)

# Scientific Programme 19<sup>th</sup> December 2019

## Panel III: Visitor Analyses

8:30-11:00 **Chair:** Inga Specht (DIE Bonn)

8:30-9:00 **The Collaboration for Ongoing Visitor Experience Studies (COVES) and the Value of Shared Reporting**  
Ryan Auster (Museum of Science, Boston)

9:00-9:30 **Uncovering Value Segments in a Science Center: How Teachers Perceive and Evaluate their Students' Learning Experience**  
Helge Kaul (EBC University of Applied Sciences, Hamburg)

9:30-10:00 **New Ways of Addressing Visitors – Evaluation of the Special Exhibition 'Artefacts'**  
Volker Schönert and Linda Gallé (MfN, Berlin)

10:00-10:30 **Guess Who's Coming to Museum**  
Gun-Brit Thoma and Olaf Köller (IPN, Kiel)

10:30-11:00 **General Discussion**

11:00-11:30 **Coffee Break**

## Panel IV: Ways and Formats to Achieve Learning Effects

11:30-13:30 **Chair:** Alexandra W. Busch (RGZM, Mainz)

11:30-12:00 **Re-conceptualizing Museums for Active and Informal Learning**  
Anne Tove Austbø (Stavanger Maritime Museum)

12:00-12:30 **Organizational Learning and Informal Learning: Recent Developments from within the Smithsonian**  
Colleen Marzec (Smithsonian's National Museum of Natural History, Washington D.C.)

12:30-13:00 **Formats for Learning in Museums – Evidence from Psychological Research**  
Doris Lewalter and Stephan Schwan (TU Munich and IWM Tübingen)

13:00-13:30 **General Discussion**

13:30-13:45 **Summary of Day 2**

13:45 **Closing and Lunch**

**Graham Black** is both an academic and a museum practitioner. This year he celebrates 45 years of working in and with museums. Today, he combines his role as Professor of Museum Development at Nottingham Trent University, UK, with museum consultancy. Exhibitions on which he has acted as Interpretive Consultant have twice won the UK £100,000 Art Fund Prize, among many other awards. His publications include two books – *The Engaging Museum*, published in 2005, and *Transforming Museums in the 21<sup>st</sup> Century*, published in 2012, both with Routledge – and numerous articles. He is currently writing what will be his third and final book, provisionally titled *The Museum Experience in the 'Age of Participation'*.



# Social Interaction, Museum Learning and the 'Age of Participation'

Graham Black

This paper argues that we have opportunities to engage audiences with our collections undreamed of by our predecessors. But, to grasp them requires new models of content delivery based on user participation and interaction. It also means changing the mind-set of the museum.

Museum visits have always been primarily social outings with friends or families, who found museums interesting and enjoyable places to explore together and discover something new – they believed our collections were worth learning about. They engaged and learned through interaction with displays and each other. In a world transformed by digital media, this is still the case but user expectations are much greater. The 'Age of Participation' has seen a revolution in attitudes, expectations and behaviour – personal, social and cultural – since the launch of the World Wide Web in 1989 and the emergence of new generations, the Millennials and Generation Z, very different to the baby boomers who previously dominated society.

These two factors are leading to museum audiences who expect to actively engage with content; to personalize their visit; to take part; to encounter different perspectives; to decide for themselves; to contribute; to share their experiences with friendship groups; to use collections; to play an active role in the museum – and to choose their own level of participation. This is both opportunity and a threat. We must meet user expectations or die.



**Kirsten Drotner**

(Dr. phil., FRDAS,

MAE) is professor of media

studies at the University of Southern Denmark where she currently directs a national R&D programme, Our Museum, which facilitates new forms of citizen engagement by designing and studying how museums interact with the public in innovative ways currently and in the past. Her research interests include children's media and information literacies, digital co-creation and creative learning and digital museum communication. She has lectured and taught in more than 20 countries around the world and she has been a research fellow and visiting professor in Canada, Norway, Sweden, the UK and the USA. She is (co-)author and (co-)editor of more than 30 books and over 200 scholarly articles and book-chapters, most recently *The Routledge Handbook of Museums, Media and Communication* (co-edited, 2018).



# **Making Sense of Sensemaking: Creative Learning in Semi-formal Settings**

**Kirsten Drotner**

Museums offer unique environments for creative learning. This is because their contents are tangible and epitomize issues of relevance to wide sections of society, be these issues art, cultural and natural history or science. Moreover, museum settings invite learning modes that differ from what is mostly found in formal teacher-led education: flexible, collective, theme-based, hands-on and student-led. These aspects are vital for creative learning processes that are noted for their combination of heart, mind and hands. Based on project results from two national research and development programmes, DREAM and Our Museum, the presentation focuses on how to study museums as creative learning environments for students aged 12-18 with particular focus on formative evaluation and the needs for methodological innovation of established assessment tools.

**Léontine Meijer-van Mensch** is director of the State Ethnographical Collections of Saxony (i. e. the ethnographical museums of Dresden, Leipzig and Herrnhut). Previously, she was programme-director of the Jewish Museum Berlin and deputy-director of the Museum of European Cultures at Berlin. She was lecturer in heritage theory and professional ethics at the Reinwardt Academie, Amsterdam and lecturer at the Department of Kulturgüterschutz, Kulturmanagement und Museologie at the Europa-Universität Viadrina, Frankfurt (Oder). She is active on the boards of several (international) museum organizations, for example member

of the Executive Board of the International Council of Museums, and a frequent speaker at international conferences.



# Unpacking the Museum: Learning and Participatory Strategies as Motors in Meaning Making and Relevancy

Léontine Meijer-van Mensch

The three aspects of *social inclusion* (access, participation, representation) are increasingly being recognized and understood as keys to sustainable development, basically (social) inclusion has become a founding characteristic of contemporary museology, for example in the ICOM *Cultural Diversity Charter* of 2010.

The *Charter* asks for the recognition and affirmation of “all forms of cultural diversity and biological diversity at local, regional and international levels, and to reflect this diversity in all policies and programs of museums across the world”. The *Charter* wishes to promote “enabling and empowering frameworks for active inputs from all stakeholders, community groups, cultural institutions and official agencies through appropriate processes of consultation, negotiation and participation, ensuring the ownership of the processes as the defining element”.

These notions are visible in the definition of heritage, the organizational models of museums, cooperation in networks and the participation of a variety of communities. The principle of “the ownership of the processes as the defining element” is often translated into the principle of *shared responsibility*: a shared responsibility of museum staff, a shared responsibility of organizations and interest groups in networks of *heritage communities*, and a shared responsibility of museums and their *creator (source) communities*.



**Tobias Nettke**

is Professor of  
Museum Education  
and Museum Inter-  
pretation at the Univer-  
sity of Applied Sciences

HTW Berlin. He studied Teaching

at the Secondary Level 1 and Educational Sciences/Adult Education,  
receiving his PhD on Interaction Analysis of Guided Museum Tours. As  
a graduate pedagogue he worked e.g. in museum education, exhibi-  
tion and media development.

Since 2010 he teaches at the HTW in the Bachelor Programme Muse-  
um Studies and in the Master Programme Museum Management and  
Communication. He works in practical projects with numerous muse-  
ums in Berlin. In addition, he is involved in the Federal Association of  
Museum Education and in the working group “Education and Interpre-  
tation” of the German Museum Association.

# **Audience Research and Evaluations at a City Museum and at a Natural History Museum from the Perspective of Museum Management and Museum Communication**

**Tobias Nettke**

Museological debates on approaches such as audience development, outreach, diversity, inclusion, participation and the ICOM redefinition of the concept of museums make clear that the educational task in museums of the 21<sup>st</sup> century is a key challenge. It is also closely linked with other tasks such as evaluations and audience research.

Especially for the Museum of Natural History in Berlin, as well as for the Stadtmuseum Berlin, the opening to a diverse audience is characteristic, paired with a self-understanding to be a place of critical dialogue. Cooperations with the Bachelor Programme Museum Studies and the Master Programme Museum Management and Communication of the HTW Berlin were able to evaluate some aspects of this effort.

Selected results from the project GenomeELECTION at the Museum of Natural History will be presented. One project addressed the question of how certain participatory formats – so-called opinion boxes – were accepted by the audience. Categories of informal learning and generic learning outcomes were used for evaluation.

Also, examples of evaluations of exhibition elements of the Stadtmuseum Berlin illustrate that exhibition planning should consider learning as well as evaluation from the beginning and, therefore, should be implemented by interdisciplinary teams and that this is embedded in further management tasks and processes.

All in all, it becomes clear that very profitable potential for all sides is evident when museums and universities work in partnership at the interface between theory and practice.

**Lorenz Kampschulte** is head of education at the Deutsches Museum in Munich. Before 2018, he worked as a research assistant at the IPN Leibniz Institute for Science and Mathematics Education at Kiel University for six years, beside others coordinating the Kiel Science Outreach Campus. Between 2009 and 2012 Lorenz directed the Center for New Technologies at the Deutsches Museum, running the exhibitions and visitor programmes on nano- and biotechnology. Simultaneously, he was a member of the strategic team developing the exhibition strategy for the general renovation of the museum. His museum career started at the Deutsches Museum in 2006, entering a scientific staff position in the team developing the new nanotechnology exhibition. Lorenz holds a PhD in nanoscience.



# Prerequisites for the Use of Exhibitions – A First Approximation Using a Delphi Study

Lorenz Kampschulte

As informal learning venues, museums represent an important element for lifelong learning. In order to use museums as learning opportunities, but also for social and recreational activities, visitors need certain prior knowledge and experience. As to the question of exactly what the prerequisites are, there is only fragmentary information in literature to date.

Based on the construct of scientific literacy, which is widely used in educational research, this study aims to determine the previous knowledge and experience relevant for a person to have a successful visit to a museum. A first step in this direction is to gather and focus the experiences implicitly or explicitly available in museums.

This is done using a Delphi study among museum professionals (curators, museum educators): In the first stage of the study, the previous knowledge and experience required for a museum visit were asked and summarized in theses in an anonymous survey process. These theses were then presented to the experts in a second, extended stage for evaluation and weighting. After revision, a third (and possibly fourth) stage will be held to refine and stabilize the statements.

Twelve of the 15 museum professionals surveyed in the first stage believe that curiosity/openness as well as communicative skills are central prerequisites for a successful museum visit. This is followed by emotional awareness and subject-specific pre-knowledge, named by eleven participants.



**Jill Stein** is an independent consultant with JKS Consulting (Corvallis OR, USA) and has 15 years of experience in audience research and museum evaluation. She has led evaluation studies in a broad range of institutions, including science centers, cultural heritage and history museums, tribal museums and art museums. Her focus areas include the role that culture plays in learning, culturally responsive research and evaluation practice and engaging non-traditional audiences. She specializes in collaborative partnerships that bring together Indigenous knowledge and western science in informal learning settings. She has a Master of Arts degree in Folklore and Anthropology, with a specialization in Museum Studies.



**Martin Storksdieck** is director of Oregon State University's Center for Research on Lifelong STEM Learning, and a professor in OSU's College of Education. He works at the intersection of research and practice, focused on STEM learning and science communication across settings and time, and on the role of science-based professionals in engaging a broader public. Martin serves on the Science Advisory Boards for the US National Oceanic and Atmospheric Administration (NOAA) and the Leibniz Institute for Science and Mathematics Education in Kiel (Germany). He is the Chair of Trustees for TERC, a non-profit R&D organization in Cambridge, MA and is a board member of the Tree Media Foundation.





# Reaching beyond the Choir: Broadening Participation in Museums through Inclusive Practices

Martin Storksdieck and Jill Stein

Museums are increasingly becoming public places for encounters with a wide range of topics and serve as important spaces for civic engagement and public discourse. This expansion in mission is accompanied by growing visitation by broader audiences. Yet museums reach less than a third of potential visitors, even though cost proves not to be a factor. Expanding visitation should be a key goal in order to respond to changing demographics and preferences, further democratize the institution, fulfill mission and vision, and respond to public (and often taxpayer) support. While the reasons for non-visitation are complex, there are a few key aspects to consider:

- (1) Improving access to museums is needed but not enough. Access needs to be accompanied by inclusion or mechanisms that increase a sense of belonging.
- (2) Audience research is key to understanding visitors and non-visitors, and partnerships with community organizations and groups who represent new audiences can help build bridges.
- (3) Community outreach builds relationships: rather than visitors coming to the museum, the museum can come to the visitor.
- (4) Museum staff need to represent the broader society and may need training on implicit bias to ensure a welcoming culture.

Finally, it should be acknowledged that while it is easy to embrace the concept of access and inclusion, it is a difficult journey to get there.



**Thomas Lilje** is co-founder and head of the interdisciplinary research and development platform [gamelab.berlin](http://gamelab.berlin).

Based at the Humboldt University, Berlin he and his team develop and put into practice various projects using the cultural technique of play. The portfolio ranges from dance theatre in Virtual Reality to Patient Empowerment through mobile gaming. With a background in philosophy and theatre science he also works as an experience and game designer and helps cultural institutions to create engagement and use digital technology for the better. In the context of museum4punkt0 he is working with the Humboldt Forum in Berlin and is developing playful experiences for the museums of the future.

# Flying Ships and Talking Exhibits – About Playful Experiences in Museums

Thomas Lilge

In her 2011 published book *Reality is Broken* game designer Jane McGonigal claims an exciting thesis: From the younger generation, the most talented people are turning to video games, because only there they find what they want most: exciting adventures, relevant knowledge, intense social experiences. Would not this also be something museums would like to claim for themselves? If so, then museums should take advantage of what game- and experience design has to offer: the craftsmanship of how to engage people through the cultural technique of play. If we understand that playfulness is not the opposite of seriousness, but the basis of human culture, as Johan Huizinga stated it in his 1938 published cultural study *Homo Ludens*, then we can design real world experiences in a way that will be motivating for everyone. At gamelab.berlin we started our design-adventures in the field of museums in 2016 with the game 'game(+ultra)' in the Martin-Gropius-Bau. Over 5,000 people played it over the course of four months. In the Deutsches Schifffahrtsmuseum Bremerhaven we recently started with '360° Polarstern', one of the biggest VR-AR-exhibitions in a museum worldwide – where people play around with a flying icebreaker. We also developed a playful application with talking exhibits in the research network museum4punkt0 for the upcoming Humboldt Forum in Berlin. The presentation will give insights into the development processes of the given examples and will also include some research about our players.

**Ryan Auster** is a Senior Research and Evaluation Associate for the Museum of Science in Boston MA, USA. Primarily a statistician, he specializes in the design of quantitative studies, and dreams of improving his data visualization and coding skills in his spare time. Ryan serves as Project Director of COVES, and participates in a wide range of informal learning projects from improving gender representation in science centers to designing frameworks for understanding facilitation techniques in engineering activities. He is currently completing a PhD in the Measurement, Evaluation, Statistics and Assessment program at Boston College. As a means of procrastinating on his writing, Ryan can usually be found on a bicycle.



# The Collaboration for Ongoing Visitor Experience Studies (COVES) and the Value of Shared Reporting

Ryan Auster

The Collaboration for Ongoing Visitor Experience Studies (COVES) is a network of museums in North America that collect visitor-level data using shared methods and measures. Focusing primarily on who visits, why they visit, what they experience, and how they feel about their experience, COVES has grown from a federally funded group of eight to a self-sustaining collaboration of more than 30 institutions over the last four years. Originally including only science centers, COVES now has natural history and children's museums as members, with plans to incorporate art museums next year. The data provided from COVES have been used to drive institutional improvement, establish reliable benchmarks for comparison, and inform the broader field of visitor experience trends.

One of the most valuable developments in COVES' short history has been the implementation of online dashboard reporting to deliver data in a timely manner and visual format that facilitates use. Importantly, each dashboard provides access to both institutional and aggregate data for comparative purposes, while filters enable users to "dig deeper" and ask questions of the data. Not only has the standardization of methods and measures enabled COVES-users to speak in a common language of data, this dashboard reporting tool has also allowed users to come together over shared questions. As a result, COVES continues to move toward a more collaborative system, with individual institutions choosing to share data openly.



**Helge Kaul**

is professor for marketing communication and creative industries at the International School of Management (ISM) in Hamburg. Before 2019, he was responsible for arts marketing and arts education at Zurich University for Applied Sciences (ZHAW) for eleven years. His primary research fields are audience development, strategic management and experience management, with an emphasis on visitor research. In all of these areas his work is focused on gaining practical insights for marketing and education based on a solid theoretical background. Currently, Helge Kaul is engaged as a research consultant for the Kulmon program in Berlin, which is supported by the State Ministry for Culture and Media and aims to provide a general visitor research platform for profit and non-profit institutions in arts, leisure and tourism.

# Uncovering Value Segments in a Science Center: How Teachers Perceive and Evaluate their Students' Learning Experience

Helge Kaul

According to latest research in public management, for public value to be created it is necessary for the related activities to have an effect on the personal attitudes and values of individuals (*Meynhard 2008*). Using the example of the Swiss Science Center Technorama, it is shown how means-end analysis (*Liebel 2007*) can uncover values that are associated with an institution and its purpose. In a quantitative analysis, teachers from primary, secondary and grammar schools were categorized as 'facilitators' (*Falk 2009*), whose main motive is to help students into a unique experience. In a qualitative stage of the research, it became clear, however, that this group is guided by further interests and motives. This is where 'laddering' has been applied, a method suitable for measuring mental structures and identifying human motivations (*Gengler/Reynolds 1995*). Among the teachers' visitor group, social motives were less dominant than pragmatic and emotional motives. Three very different value segments emerged in the analysis: 'pragmatists', 'experiential facilitators' and 'personality coaches'. The insights gained can be used both to evaluate and legitimize publicly funded programs and to promote the development of offerings that appeal to teachers, students and educational institutions.





**Linda Gallé**, Exhibition Curator and Project Manager, Museum für Naturkunde, Berlin (MfN).

Linda had a leading role in the conceptual development of numerous exhibition projects like “Giant Panda”, “Tristan – Berlin bares teeth”, “Macaws” and “Artefacts”, which has contributed to the successful development of the museum’s visitor numbers in recent years.

She is involved in teaching activities on regional and international levels Universität der Künste Berlin, University of Applied Sciences HTW Berlin, Marie Curie Fellows EU and member of the core team working on the “Zukunftsplan” for the major re-building of the MfN over the coming years. Her ambition is to make collections, scientific processes and current research visible and explore new forms of participation and dialogue.

**Volker Schönert**, Visitor Research and Evaluation, Museum für Naturkunde, Berlin (MfN). Volker joined the MfN in 2018 as a research associate and is entrusted with the development of a structured visitor research within the framework of a systematic audience development. The main goal is to implement science education and visitor research as an integral part of the museum’s work. Before joining the MfN, he worked as a freelancer in the area of visitor research for various museums, including the Ozeaneum/Meeresmuseum Stralsund, the Deutsches Technikmuseum, the Hygiene-Museum Dresden and the Jewish Museum Berlin. Volker’s ambition is to reach a diverse audience and effectively communicate the content and concerns of the MfN.





# **New Ways of Addressing Visitors – Evaluation of the Special Exhibition ‘Artefacts’**

**Volker Schönert and Linda Gallé**

This session focuses on the conception and evaluation of an experimental exhibition project that took place at the Museum für Naturkunde in Berlin.

Together with photo artist J Henry Fair and scientists from the Joint Research Center of the European Commission, we created “Artefacts”, an exhibition about the human impact on nature. Bringing together art and scientific facts the exhibition aimed to sensitize visitors for the environmental crisis and to trigger reflection about the human-nature relationship and our individual as well as collective behavior.

To go one step further, we used the exhibition as an experimental field to test new ways of bringing scientists into dialogue with visitors. In the “Meet an Expert” live sessions visitors could approach real scientists in an informal face-to-face setting, ask questions, bring in their views or articulate their concerns about complex topics like climate change, food production, insect loss etc.

Here exhibition curator Linda Gallé provides a short input from the perspective of the exhibition creators about the concepts and aims of the project, whereas Volker Schönert presents the different instruments, aims and results of the visitor evaluation that accompanied the exhibition.

**Gun-Brit Thoma** studied pedagogy at Kiel University. She holds a PhD in education from the Leibniz Institute for Science and Mathematics Education (IPN) on the topic “Learning in museums”. Currently she is working as a post-doc researcher in the department for “Educational Research and Educational Psychology” at the IPN. Her research foci are museum visitors, cognitive learning and attentional processes in formal and informal settings, as well as science communication.



**Olaf Köller** is director of the Department of Educational Research at the Leibniz Institute for Science and Mathematics Education (IPN), IPN’s managing director of research, and full professor of educational research at the University of Kiel, Germany. After graduation in psychology in 1991 he started his scientific career at IPN. In 1996 he changed to the Max Planck Institute for Human Development, where he finished his dissertation (Ph.D.) in 1997. In 2002 he accepted the offer of a full professorship at the University of Erlangen-Nuremberg. In 2004 he changed to Humboldt University, Berlin. As a full professor of educational research and the founding



director of IQB, Olaf Köller was responsible for the national assessment of educational progress in Germany. Aside from his activities in academic assessment, his major research interests are reciprocal effects of motivation and achievement, implementation of change in schools and out-of-school learning.

# Guess Who's Coming to Museum

Gun-Brit Thoma and Olaf Köller

There has been a constant trend in the last decades for museums to move from displaying artifacts to institutions focusing on the education and entertainment of visitors. To design an exhibition that not only offers learning opportunities and enjoyable experiences, but also fulfills all the different expectations and needs visitors bring into the museum is not an easy task. Therefore, museums need to gain deeper insight into who their visitors are. This is the point, where the Leibniz-Group “Educational Research meets Research Museums” comes into play: by querying and analyzing the abilities, competencies and prerequisites that visitors bring into a museum, the group’s aim is to gain a better understanding of museum visitors. To this end, a visitor survey was conducted at eight museums in Germany: three natural history, two historical/cultural, one science/technical and two archaeological museums. The survey was run at three different time points at each museum between October 2018 and November 2019, resulting in a total sample of 4,616 visitors. This procedure allows for a broad sampling of the visitor structure, roughly replicating the overall visitor structure. Visitors were asked to answer a questionnaire on a tablet. It comprised questions about their demographic background, socio-economic status, pedagogical and psychological constructs and museum related questions. Our multivariate statistical analyses revealed differences between the visitor profiles of the museums analyzed. Furthermore, latent profile analyses were conducted to identify different mind-sets of visitors.

**Anne Tove Austbø** (cand. phil., curator NMF) is museum curator and research coordinator at the Stavanger Maritime Museum, Norway. Her academic fields of interest are maritime history and culture of the 19<sup>th</sup> and 20<sup>th</sup> century, museum history, museology, the didactics of history and the history of Stavanger. She has broad experience in researching and curating museum exhibitions, teaching students and writing academic publications. In 2018, she held a fellowship as visiting researcher at the German Maritime Museum – Institute of the Leibniz Association. She is currently working on a PhD-project which investigates historic photographs of ship crews and the visual representation of seafarers in the late 19<sup>th</sup> and early 20<sup>th</sup> century.



# Re-Conceptualizing Museums for Active and Informal Learning

Anne Tove Austbø

As caretakers of collections which are accessible for everyone, most museums are designed for learning. However, no two museums are quite alike, as they vary greatly in scope, collections and physical surroundings. How they meet and engage with their audience also differs. Museums and objects can thus be communicated and perceived in a multitude of ways. Therefore, museums are especially well-suited to design visitor experiences that emphasize long-term learning effects.

Museums are, however, not neutral spaces, and the objects and collections that they hold carry layers of culturally created meanings. When the audiences meet the exhibits, new meanings are often applied, whether intentionally or not, as the visitors pursue personal interests and take charge of their own learning experiences. Museums therefore have the possibility of designing their exhibitions as settings where learning theory is put into action.

Looking at museum collections as material objects with transformative capacity, the presentation highlights examples of how museum objects and settings can be researched and re-conceptualized. Building on the concepts of active learning and personal agency, it also demonstrates how recent learning theory is implemented when the Stavanger Maritime Museum invites diverse groups and audiences to their exhibitions.

**Colleen Marzec** is the Chief of Science Learning/Content Development at the Smithsonian National Museum of Natural History, Washington D.C., USA. She leads a team of museum educators with expertise in natural-history science, collections-based learning and educational media. Her team is currently working on an evaluation of a framework of educational outcomes for use at the programme and department level and a study of learning outcomes among young students who engage with interactive, distance learning programmes. Her recent work includes supervising an evaluation of organizational learning at the museum and developing a proposal to establish an informal learning research centre within the museum. She recently joined as

co-principal advisor a National Science Foundation (NSF) funded project 'Lineage: A Cross-Platform Learning Experience Exploring the History of Life on Earth' (Twin City Public Television and NMNH).



# Organizational Learning and Informal Learning: Recent Developments from within the Smithsonian

Colleen Marzec

The National Museum of Natural History has expanded its educational offerings to reach more people. The programmes and activities are based on the natural history collections and research conducted by the museum's scientists. Yet few actions could do more to scale our impact on learners than a greater investment in informal learning research. We have recently embarked on new directions as we seek to deepen our involvement in and commitment to research and achieving long-term learning effects with our visitors and audiences. A part of this involves looking at ourselves and our own organizational culture to examine whether we have strong learning values present in the workplace, such as collaboration, reflection, aspirational thinking and experimentation. This presentation will share an unusual internal study we recently conducted that investigated where we are as "a learning organization". In addition, our education staff is proposing the creation of a new center for learning research at our museum that will investigate questions about visitor learning, curiosity and wonder, perceptions of science, as well as connections to nature in this informal learning environment. We are exploring different ways we could open up our museum as a "living laboratory" to more scientists from universities and institutes who would work with us to study how learning happens in our exhibits and programmes and the impacts on our audiences. This presentation will share some of the models under consideration and learning research projects we seek to build on.



**Doris Lewalter** is professor for Formal and Informal Learning at the School of Education, Technical University Munich (TUM). Her research focuses on the analysis of the conditions, processes and results of learning and teaching (with an emphasis on motivational aspects) in formal and informal settings such as schools and universities, museums, student laboratories and media. She studied pedagogy with minors in psychology and art history, received her PhD in 1996 and completed her habilitation in 2003. She held a professorship for educational science at the RWTH Aachen (2004-2006).



**Stephan Schwan** is head of the Realistic Depictions Lab and Deputy Director of the Leibniz-Institut für Wissensmedien (IWM). His research focus is on the role of digital media and authentic exhibits for informal learning in museums, cognitive processing and comprehension of dynamic audiovisual media, and knowledge acquisition with topographic and thematic maps. He studied psychology at the University of Tübingen (Diploma 1989), where he received his doctorate (1992) and did his habilitation (2000). From 2002 to 2004 he was full professor for e-learning at the Johannes Kepler University Linz (Austria).





# Formats for Learning in Museums – Evidence from Psychological Research

Doris Lewalter and Stephan Schwan

One of the main objectives of museums is to provide attractive learning opportunities for a wide audience. In our paper, we start by reflecting on the museum as a learning environment and on learning processes in museums from a psychological point of view. We then present examples from three research projects that deal with learning processes in the museum and how these depend on different designs of target group-specific instructions and on various media offerings. We first present findings from a comparative study on the influence of different instructional designs of school class visits on students' learning impact and motivation during the visit. Secondly, we show the results of a study in an archaeological museum on the combined uses of authentic exhibits and reconstructions regarding the time spent in the gallery by leisure-time visitors, their interest and knowledge acquisition. Finally, we present the findings of a quasi-experimental comparative study on differences in a science museum visitors' learning and broader visit experience when presenting them with photos of objects, with real objects, or objects that can be explored by touch.

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## Public Transport

Subway: U6 (Naturkundemuseum)

S-Bahn: S3, S5, S7 Hauptbahnhof) / S1, S2, S25 (Nordbahnhof)

Tram: M5, M8, M10, 12 (Naturkundemuseum)

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