

Curriculum Vitae Dr. Sebastian Opitz



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Person

Dr. rer. nat. Sebastian Opitz

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Telephone: +49 (0)431 880 5117
Date of birth: August 14th, 1985
Languages: German
English
French

Training, Experience & Skills

Research, Management and Cooperation

- Planning and conducting large-scale quantitative assessment studies
- Continuous cooperation with software developers, scientists from a broad range of disciplinary backgrounds, teachers in curriculum development, educational authorities, politicians
- Management, administration, and data management in larger research projects
- Coordination and development in a large international association (International Biology Olympiad): e.g., membership services and legal structures
- Experience with various methods of study design and data analysis, e.g., Open-ended & closed assessment items, ThinkAloud protocol interviews, cognitive pretesting interviews for item development, interviews about instances, structured exploratory interviews, classroom observations, artifact collection
- Participation in the assessment development groups for NEPS Germany and eTIMSS 2023
- Supervision/tutoring for bachelor, master, and doctor thesis projects
- Participation in multiple workshops on career planning, presenting, and scholarly publishing

Methodological training

- Experience with a broad range of quantitative and qualitative research methods
- Graduate school courses on classical and probabilistic statistics, as well as on qualitative research
- Frequent application of statistics software, e.g., SPSS, Mplus, Conquest, MS Excel, R
- *Employed quantitative analyses:* Scale-building statistics, exploratory and confirmatory factor analyses (EFA/CFA), ANOVA, ANCOVA, Repeated Measures ANOVA, regression models, Rasch modeling, DIF-tests, structural equation modeling (SEM)
- *Employed qualitative analyses:* Inter-rater reliabilities, categorization and evaluation of qualitative audio and video data using MAXQDA and STUDIOCODE software, qualitative content analysis (Mayring, 2010)

Conferences, symposia, etc.

Posters, oral presentations and symposia at, e.g., ERIDOB 2012, NARST 2013, ERIDOB 2014, ESERA Summer School 2014, NARST 2015, NARST 2017, ERIDOB 2018, FDdB 2019, International Biology Olympiads 2017-2020

3 Professional Activity

- 07/2017–
- Research Scientist at IPN – Leibniz Institute for Science and Mathematics Education at Kiel University, Department of Biology Education
- Head of the Office of the International Biology Olympiad Association (*volunteer*)
- 05/2016–
06/2017
Research associate
CREATE for STEM Institute, Michigan State University, USA
(Work group of Prof. Joseph Krajcik)
- 10/2014–
01/2015
Visiting scholar
Weizmann Institute of Science, Israel
(Work group of Prof. David Fortus)
- 10/2011–
04/2016
PhD program, see below

4 Education

- 10/2011–
04/2016
PhD program in science education,
IPN - Leibniz Institute for Science and Mathematics Education at Kiel University, Germany
Work group of Prof. Dr. Ute Harms (biology education)
(Degree received: July 2016, “magna cum laude”)
- 09/2008–
07/2009
Study abroad program, Studies in Biology and English
University of Aberdeen, UK
Erasmus scholarship by the European Union
- 10/2006–
07/2011
Degree for middle and high school teaching in Biology and English
University of Kiel, Germany
(Degree: 1st State Diploma, equivalent to Master’s degree, July 2011)
- 10/2005–
09/2006
Law studies at Kiel University and Jena University, Germany
- 08/1996–
04/2005
Middle and High School
Jürgen-Fuhlendorf Gymnasium, Bad Bramstedt, Germany and
German School of Tokyo/Yokohama, Japan
(“Abitur”, high school diploma, received 04/2005, Point average: 1.9)

5 International experiences

2016/2017	Post-doc position, USA (14 months)
2014/2015	Research visit, Israel (3 months)
2008/2009	Study-abroad program, Scotland (10 months)
2005	Internship, New Zealand (1 month)
2004/2005	High school and internships, Japan (13 months)
2001	Student exchange, Canada (4 months)

6 Publications

Peer-review

Opitz, S. & Harms, U. (2020). Assessing High Performers in the Life Sciences: Characteristics of Exams used at the International Biology Olympiad (IBO) and Their Implications for Life Science Education. *CBE – Life Sciences Education*, 19(4), 1-18.

Fortus, D., Kubsch, M., Bielik, T., Krajcik, J., Lehavi, Y., Neumann, K., Nordine, J., **Opitz, S.** & Touitou, I. (2019). Systems, transfer, and fields: Evaluating a new approach to energy instruction. *Journal of Research in Science Teaching*, 56(10), 1341-1361. DOI: 10.1002/tea.21556

Opitz, S., Neumann, K., Bernholt, S., & Harms, U. (2019). Students' energy understanding across biology, chemistry, and physics contexts. *Research in Science Education*, 49(2), 521–541. DOI: 10.1007/s11165-017-9632-4

Bielik, T., **Opitz, S.**, & Novak, A. M. (2018). Supporting students in building and using models: Development on the quality and complexity dimensions. *Education Sciences*, 8(3), 1-31. DOI: 10.3390/educsci8030149

Opitz, S., Harms, U., Neumann, K., Bernholt, S. (2017). How Do Students Understand Energy in Biology, Chemistry, and Physics? Development and Validation of an Assessment Instrument. *EURASIA Journal of Mathematics, Science and Technology Education*, 13(7), 3019–3042. <https://doi.org/10.12973/eurasia.2017.00703a>

Opitz, S., Blankenstein, A., & Harms, U. (2017). Student conceptions about energy in biological contexts. *Journal of Biological Education*, 51(4), 427-440. DOI: 10.1080/00219266.2016.1257504

Opitz, S., Harms, U., Neumann, K., Kowalzik, K., Frank, A. (2015). Students' Energy Concepts at the Transition between Primary and Secondary School. *Research in Science Education*, 49(5), 691-715. doi 10.1007/s11165-014-9444-8

Appelhans, Y., Thomsen, J., **Opitz, S.**, Pansch, C., Melzner, F., & Wahl, M. (2014). Juvenile sea stars exposed to acidification decrease feeding and growth with no acclimation potential. *Marine Ecology Progress Series*, 509, 227–239. doi: 10.3354/meps10884

Editorial review

Opitz, S., & Opitz, M.-T. (2016). Winterschlaf: Energiesparen als Überlebensstrategie [Hibernation: Energy Saving as a Survival Strategy]. *Unterricht Biologie*, 40(411), 18-23.

Kelpe, M., Damaschun, A., Gutsche, S., Harms, U., **Opitz, S.**, Pareigis, J., Schmidt, S., Sommer, C., Wakilzadeh, G., and Weigt, I. (2016). Kompetenzorientierung im Sachunterricht [Competence-oriented science education]. In: *Entwicklung kompetenzorientierten Unterrichts in Zusammenarbeit von Forschung und Schulpraxis*. Waxmann: Muenster, Germany, pp.185-204.

Monographs

Opitz, S. (2016). *Students' Progressing Understanding of the Energy Concept: An analysis of Learning in Biological and Cross-Disciplinary Contexts*. Doctoral thesis, Leibniz Institute for Science and Mathematics Education, Kiel University, Germany. 358 pages

Available [HERE](#)

Opitz, S. (2011). *Vergleichende Untersuchungen über den Einfluss von erhöhtem Seewasser $p\text{CO}_2$ auf den gemeinen Seestern *Asterias rubens* L. in der Ostsee* [Comparative Analysis on the Influence of Increased Sea Water $p\text{CO}_2$ on the Common Starfish, *Asterias rubens* L. in the Baltic Sea], Staatsexamensarbeit [Master thesis equivalent], Helmholtz Center for Ocean Research Kiel/Germany, 112 pages.

Available [HERE](#)