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The conference proceedings from the 7th CARN^{D.A.CH.} conference are published by Praesens Verlag; the full publication in German can be ordered directly from the publishers.

Titles of articles and abstracts in English are given here.

CARN^{D.A.CH.}¹ is the German-language branch of the Collaborative Action Research Network² and the 7th conference took place at the Pedagogical University Tyrol in Innsbruck from the 18th to the 19th of January, 2019. CARN^{D.A.CH.} was created after the 2011 CARN International Conference organized by the Institute for Instructional and School Development at the University of Klagenfurt in Vienna attended by a number of German-speaking participants interested in meetings held in German. The first German-language conference was held in Vienna in 2013 - as was the second. This was followed by conferences in Graz, Bremen, Linz and Bielefeld. The number of participants and papers submitted has increased continuously.

With a total of 80 participants, the conference in Innsbruck was the largest to date and was also the first to be held in western Austria. Participants came from Germany, Austria, Switzerland, South Tyrol and Siebenbürgen in Romania. The conference focussed on "Sustainable Education" and "Education for Sustainable Development" from different perspectives demonstrating a variety of approaches. The range of themes dealt with in the 19 articles published in the first CARN^{D.A.CH.} Conference proceedings reflect the diverse approaches to the theme. The volume consists of five chapters each centred on a specific perspective.

¹ <https://ius.aau.at/de/das-ius/netzwerkekooperationen/carn/>

² <https://www.carn.org.uk/?from=carnnew>

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In the opening chapter the authors deal with aspects of "Education for Sustainable Development". The first contribution is a written version of the keynote in which teachers and researchers from the Pedagogical University Tyrol present discipline-specific perspectives on education for sustainable development and, with the aim of anchoring them in their own institutions in a way that has a broad impact, bring them into a context. The following contributions, which present the concept and research findings of the Education for Sustainable Development course in Austria and provide an insight into the action research project "Spatial planning in factual instruction", illustrate the role action research can play in Education for Sustainable Development.

The second chapter is devoted to participation. It presents two research projects that pursue different approaches in different disciplines. The first article shows how participatory research workshops represent added value for action research, with the second article discussing how a critical art education on site can lead to interventions in public space being perceived as an emancipation process.

In the third chapter, authors deal with the topic "Health in schools" from two different perspectives.

The fourth chapter focuses on "Sustainable learning and teaching" from the perspective of various subject areas and also on programmes for sustainable Continuous Professional Development.

In the concluding chapter, the contributions deal with current approaches to action research, especially with Lesson & Learning Study. The concluding text summarizes trends in action research and looks at future developments.

Innsbruck, December 2019

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Abstracts

I. Education for Sustainable Development

Perspectives on Education for Sustainable Development

By Barbara Benoist-Kosler, Thorsten Kosler, Helga Mayr, Anna Oberrauch

As an educational institution, orienting oneself towards Education for Sustainable Development (ESD) means exchanging existing specific disciplinary perspectives as well as inter- and transdisciplinary approaches and bundling them in a meaningful way with regard to relevant questions and projects. Accordingly, this article presents specific disciplinary perspectives on education for sustainable development as perceived by university teachers at the Pedagogical University Tyrol (PHT). The authors who focus on ESD from different disciplines (primary science, geography, economics) and in different educational areas (elementary, primary and secondary education, continuous professional development). Working from three central questions "What does education for sustainable development mean?", "What are the results of research work on ESD at the PH Tirol?" and „What are conditions for success?", pointed statements are made, differences and similarities in approaches are made visible and conclusions are drawn for a broadly effective institutional anchoring.

Action research in postgraduate courses. Concepts & research findings with reference to the Austrian ESD course

By Franz Rauch und Burgi Wallner

This article presents the conception and general characteristics of the PFL courses (pedagogy and didactics for teachers), which have been implemented successfully for many years at the "Institute of Instructional and School Development" at the Alpen-Adria-University, Klagenfurt. The participatory aspect of action research is highlighted as a central element of the PFL courses. Based on the example of the course "BINE (Education for Sustainable Development - Innovations in Schools and Universities") focussed insights into the concrete working methods within the framework of action research are given and evaluation results presented.

Design.2030: Global Goals Design Jam

By Helga Mayr

This action research project developed a Global Goals Design Jam as a specific learning event with 40 pupils from six different upper second-ary colleges and examined them with regard to competences that are considered crucial to education for sustainable development. This was carried out in view of the question of how to think and work in order to master the challenges of the 21st century. Thematic background, re- search design and selected findings are presented in the article.

ESD as exemplified by CLIL in the Digital Business Class at the Commercial College in Feldkirch

By Monika Madl

The European Parliament stated in their Recommendation on key competences for Lifelong Learning (2006 and in their Review 2018) that increasing the level of official and other languages is of high priority. Language-Competence is therefore vital to understand, discuss and work on important topics of a sustainable development world- wide. Content and Language Integrated Learning (CLIL) is one step towards building and training the important language competence. The introduction of CLIL in the vocational colleges in Austria has not reached a real break-through yet. This paper should contribute to gain insight into the barriers of CLIL-Implementation and offers a possible way for a successful implementation. The data was gathered through interviews with teachers and heads of two different voca-

tional Colleges (HTL and HAK), the personal research documentation of the author and from reports of European CLIL-Studies.

Spatial planning in the Primary natural science classroom: a research and development project

By Regina Atzwanger, Peter Kurz & Regina Steiner

Spatial planning creates living space for present and future generations. However, it is not possible to contribute without knowledge of the basics of spatial use and design. Teaching materials and workshops in the context of the project "Spatial Planning Goes School" in Styria, Austria are some of the few resources available for primary schools. A team of teacher educators is currently involved in a project to evaluate and further develop the resources. The research question is, "How should teaching materials and courses for teachers be designed so that teachers are able and willing to integrate the topic of spatial planning into their teaching?" In order to specify a first quantitative exploratory survey, interviews were conducted with elementary school teachers. Another data source was Regina Atzwanger's personal experience conducting the workshops. The research team interpreted the data in several discussion workshops, whereby we had the chance of communicative validation of the outcomes.

II. Participation

Sustainable Education through Participation

By Waltraud Gspurning & Andrea Mayr

In this article we analyse how participative research can initiate sustainable education processes. We see the term "education" as a reflective, emancipatory subject-environment relation. After a theoretical introduction on participative research we present our project NEP (New Volunteering and Participation) in which two researchers in the field of social pedagogy (the authors) worked together in a participative workshop with nine practitioners (volunteers) from different fields of social work. The aim of the project was to define current problems of new volunteering programmes and to research them systematically. In our analysis we work out four different aspects of sustainable education, initiated through the participative workshops: 1. Practitioners expanded their knowledge of their working fields, 2. Practitioners began to actively create their working fields, 3. Researchers and practitioners exchanged their knowledge and 4. Researchers and practitioners reflected on the participative research process. We conclude that time is an essential factor for initiating sustainable education by participation.

Participative Research & cultural education – Set of methods for political culture and education work

By Laila Huber

Artistic methodologies play an important role in the context of socially engaged participatory research and facilitate innovative and creative methods of investigation, research, analysis, representation and intervention. This article deals with two concrete questions concerning the role of participatory research at the intersection between critical art mediation and education:

- How can methodologies of social-science-research and artistic and cultural strategies be combined?

- What can such a methodological set facilitate in the context of emancipatory cultural and educational work in school settings?

- These questions will be discussed on the basis of the project "Making Art – Taking Part!", a participatory research project at the intersection between critical art and culture mediation. Possibilities, potentials and limits of participatory research in the context of sustainable critical art and culture mediation will be discussed.

III. Health in School

School medical care - a well accepted, low-threshold offer of the school support system. Results of a practical study
By Angela Huber-Stuhlpfarrer

For 150 years Austrian school doctors have taken care of pupils' health and well-being. The results of a recent collaborative action research study underline the significant role of school doctors within the school-support system and point out the opportunities that school doctors have to carry out preventative work. A demand-driven comprehensive support for pupils can be achieved based on good cooperation between the different players within a school-support system. This article focusses on school medical practice and shows up how school doctors can play an essential role in health and preventative education and prevention programmes for school students. School doctors function as low-threshold contact persons for both health and/ or psycho-social matters and are available as confidential medical counsellors for all pupils independent of the socio-economic status of their families.

Promoting resilience for teachers through a school support system

By Christine Thrainer-Weissenbacher

The aim of the following article is to discuss the support systems within secondary schools and the relevance of resilience in order to maintain teachers' health. Action research serves to answer the question whether or how already existing support resources within the school system may support resilience within the school system in order to prevent and counteract work strain and risk factors affecting the teaching profession.

In conclusion: An effective school support system must, above all, include a scaffolded structure in which the school partners define and activate local resources, experts from within the system and, finally, it must also seek cooperation with external experts. "The best help is the help which happens immediately and locally at school."

IV. Sustainable Learning & Teaching

ARTIST – An international co-operation to strengthen action research in teacher education

By Ingo Eilks, Nadja Belova, Marika Kapanadze, Ivano Laudonia, Moritz Krause und Franz Rauch

This chapter describes the ARTIST project. ARTIST stands for Action Research to Innovate Science Teaching and aims at the development of Capacity Building in Higher Education within the framework of the ERASMUS+ programme of the European Union. A central goal of the project was to introduce the philosophy of action research to teacher educators and teachers in the field of natural sciences from seven countries. According to the ARTIST concept, action research aims at the research-based development of science education in conjunction with continuous professional development for teachers.

The method of autonomous writing in the Physics classroom from the learner perspective

By Artur Habicher

The article describes two action research projects on independent writing in natural science subjects carried out by lecturers at the Pedagogical University Tyrol. The projects led to the extensive "NAWIscripT" project, where we investigated how scientific competences and sub-areas of writing competence develop when lower-secondary pupils write texts on lesson content.

The results of the projects and practical classroom experiences through the method of independent writing encouraged us to include the method in methodology courses for future Physics teachers. The project described examined the attitude of students towards independent writing in the Physics classroom and the advantages and disadvantages. The students were required to write a method recommendation to a colleague. The students' texts were evaluated through qualitative content analysis. The texts demonstrated a very positive attitude on the part of the

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students towards the use of the method and a wide range of advantages and application possibilities were mentioned.

ARC: Action Research Networks for Language Teachers

By Christine Lechner, Marianne Jacquin, Renata Zanin, Tita Mihaiu

Action Research Communities for Language Teachers is a project within the ECML Programme 2016-18. Specific objectives of the ARC project were to introduce language teachers from different countries to action research approaches and to support the development and implementation of action research projects across national borders. The projects carried out were intended, on the one hand, to familiarise participants with different language teaching and learning situations in Europe, and, on the other hand, to raise awareness of the potential of action research. Some participants found it difficult to start their action research, to define the research question, to choose appropriate tools and to evaluate the results. Based on this experience, the research team has developed tools to facilitate the entry into action research such as the ARC-Spiral, the checklist, dialogue sheet and template for AF workshops in an international setting.

Learning environment for the topic of 3D- Vision

By Ingrid Krumphals, Claudia Haagen-Schützenhöfer

Vision is an integral part of our everyday life as we are used to perceive our natural surroundings in three dimensions. Nowadays, the 3D-cinema, Virtual-Reality-videoclips and -videogames as well as 3D-printed gadgets are taken for granted. Students get into touch with 3D-technology very easily. Thus, it can be hypothesized that the topic of 3D-vision can stimulate interest and may lead to motivation for science learning. In order to address the topic of 3D-vision, an extracurricular learning environment was developed and implemented at the Open Labs Graz ("Mitmachlabore Graz"). The concept was tested with 10-11 grade students. The students' intrinsic motivation concerning the learning environment was mediocre to high. In terms of conceptual understanding, we were only able to identify learning gains for some sub-topics (vision, disparity). However, a lack of student understanding concerning image formation and real and virtual image was detected. These findings are the basis for adaptations in the next design cycle.

Professionalisation and Continuous Professional Development for Teachers

By Stefan Zehetmeier, Franz Rauch & Angela Schuster

This article focuses on concrete initiatives for teacher professionalisation and further education: the university courses PFL (pedagogy and didactics for teachers), ProFiL (professionalism in the teaching profession) and BINE (education for sustainable development - innovations in schools and universities). For each of the three courses the theoretical-conceptual background as well as the results of evaluation and accompanying research are presented.

PFL-English. Developments & Adaptations

By Christine Lechner

The article sets out to exemplify the specific nature of the PFL Courses for English teachers. It is to be seen as complementary to the longer article by Zehetmeier et al. in this edition and traces the specific development, aims and status quo of the PFL-English courses.

Expectation of self-efficacy and motivation at the interfaces of the educational biography

By Christine Biermann, Johanna Gold, Dominik Zentarra

Transitions between individual educational institutions represent major upheavals in educational pathways. These educational transitions are of great importance for the further lives of young people, which results in the necessity of a pedagogical design of this phase of life. This topic is addressed by the laboratory school "Laborschule Bielefeld" as

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part of the project “Transition of students from lower secondary level to further school and vocational settings”. The project is a longitudinal qualitative study. From the analyses made so far, the aspects of perceived self-efficacy and motivation will be focused within the framework of this contribution. The results of the group discussions indicate that the support received in the Laborschule Bielefeld in developing and experiencing self-efficacy and the ability to act is retrospectively seen as a central and very valuable preparation for the transition into receiving systems. This paper examines the extent to which the special pedagogical concept of the Laborschule Bielefeld supports the experience of self-efficacy.

V. Lesson & Learning Study

PFL & Lesson Study

By Gabriele Isak

Lesson Study as a highly effective concept for the professionalization of teachers and the improvement of instruction is becoming increasingly popular around the world. Even in Austria, Lesson Study is being implemented in various settings of initial teacher education and Continuing Professional Development for teachers, among them some of the PFL courses. In fact, Lesson Study seems to be the perfect supplement to the Action Research concept that forms the basis of the PFL courses, as Action Research tools are actually used in class to observe and analyze a lesson. Lesson Study promotes cooperation among teachers, professional exchange and can help to implement innovations in the educational system. The focus in Lesson Study is on the learner, though, while in Action Research the focus is on the teacher. Implementing Lesson Study in PFL seems to have benefits on various levels: the schools, the teachers and the pupils.

The roles of knowledge partners in Lesson Study

By Claudia Mewald

This article describes the roles of knowledge others in Lesson Study and it explains how knowledge others can assist learners and teachers through collaborative planning, targeted observation and shared reflection thus providing effective support for their learning. Lesson Study is discussed both as a means of developing professionalism and as a method that promotes learning for all participants. Differentiated objectives are identified as critical elements and necessary prerequisites for managing collaborative processes. Moreover, the importance of collaborative practitioner research in the successful development of pedagogical knowledge and good practice is demonstrated.

Learning Study in the modern language classroom - a case study from the Variate 2|3 project

By Harald Spann

Learning study, a variant of collaborative action research which is based on variation theory, is currently discussed as an effective approach for supporting teaching and learning processes in both secondary and tertiary education. In the context of foreign language teaching and learning the question arises what the potentials of variation theory and learning study for the practice of teaching foreign languages in schools and in language teacher education are. This question is at the centre of Variate 2|3 (short for “A Study into the Potential of Variation Theory in EFL Teaching and Learning at Secondary and Tertiary Level”), a long-term research project, run by the Department of English | Secondary Education at Pädagogische Hochschule Oberösterreich. This article reports a Variate 2|3 case study, which was carried out with English teachers and their students at a secondary school. After a short introduction to variation theory and to planning and conducting a learning study, the article reports selected research results from this study. Drawing on both qualitative and quantitative data, the findings suggest a number of potentials, but also content-related and structural challenges facing teachers when using variation theory and learning study in the EFL classroom.

Perspectives for the Future

Action research: perspectives for the future

By Peter Posch

Action research provides answers to challenges. The concluding article summarizes some of these challenges and sketches the great variation of approaches for which action research serves as umbrella term. Finally, it looks at present developments and the rapid spread of lesson studies in many countries.

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