PROJECT OBJECTIVE

1. #H²S as an approach for research on and implementation of health and well-being in a digitalizing school system

Digitalization is one of the key issues of our time. (Inter-)national programmes, which are implemented as a ‘digitalization offensive’ for science, research and transfer, illustrate its central importance (e.g. ‘Masterplan Digitalisierung’ by Lower Saxony Ministry of Economics, Labour, Transport and Digitalization, 2018). Funding priorities include. The digitalization of research methods and the automation of evaluation procedures, as well as digital processing and usage of targeted results in innovative fields of application. In addition, in recent years schools as public institutions have been given the task of practising the use of digital media as a "cultural technique" (KMK, 2016). Educators are faced with the challenge of constantly weighing the primacy of technology (the technically possible) against the primacy of pedagogy (the pedagogically meaningful) in their professional behaviour (BMBF, 2016; Herrlinger & Rothland, 2020).

Like digitalization, health and well-being have increasingly become a core social issue at various levels. From a socio-economic perspective, health and well-being are now regarded – in addition to ‘hard’ indicators such as the gross domestic product (GDP) – as central indicators for the welfare of states, their economic performance and social progress. They are also extensively considered in (inter-)national surveys (e.g. European Commission, 2009; 2019; OECD, n.d.; Sirgy et al., 2006; Stiglitz, Sen & Fitoussi, 2009). From a health policy perspective, Health in All Policies (Ståhl et al., 2006; WHO, 2010) is advocated with the aim of achieving Health for All (e.g. WHO, 1999). The focus is on a positive concept of health, which refers to the promotion of health and well-being and not only to the prevention of disease or infirmity (WHO, 2005).

In all these discourses, the importance of schools as a setting for nationwide sensitization for and promotion of health and well-being is emphasized, since it is here that students (as the up-and-coming generation of citizens) and teachers (as representatives of one of the largest professional groups and as multipliers for health and well-being) can be reached (Dadaczynski et al., 2015; 2020; Hartung & Rosenbrock, 2015). This becomes all the more important against the background of current health challenges such as the corona pandemic.
The project #H²S connects both the intentions linked with digitalization for the development of innovative procedures for data collection, evaluation as well as transfer of the results and desiderata related to content, methods and transfer with regard to health and well-being in the school context. From this, we come to the following research questions:

- What potentials do digital data collection and evaluation formats show for researching the dynamics of health and well-being in the multi-level school system?
- Which aspects have to be taken into account when designing and implementing an adaptive blended-learning scenario for the promotion of health and well-being in the school context?
- What effects does such a format (presented content and its digital-based implementation) have for a sustainable promotion of health and well-being at the level of school players (individual level: school administrators, teachers, students) and at the level of schools (meso-level)?

2. #H²S-EDITA: Innovation potential / Expected findings

In the project #H²S, methodological and transfer research are directly interlinked with the common focus on the additional benefits of digital technologies. The project will
define potentials of digital survey and evaluation formats for research on health and well-being in the multi-level school system,

- develop and test formats of digital and automated data analysis and

- design, pilot and evaluate digital learning environments for sustainable implementation of health and well-being in the multi-level school system.

In summary, the project #H²S has the following potentials for innovation:

**CURRENT STATE OF RESEARCH**

1. **Multilevel school system and school development**

The fundamental task of schools as places of formal education is to enable all students to participate actively and responsibly in cultural, social, political, professional and economic life as well as to counteract disparities in education (Cress et al., 2018; Ackeren et al., 2019). As described in the introduction, both digitalization and health and well-being are considered as core issues of social participation with ever increasing urgency. Schools are thus facing two current challenges that must be taken up in the context of school development (Gerick, Eickelmann & Rolf, 2017; KMK, 2012; 2016; Paulus et al., 2016). In order to avoid gaps of implementation, all three levels of "holistic school development" (Rolf, 2016) must be closely coordinated: The **macro-level** (level of the school system, administrative framework and measures), the **meso-level** (level of the individual school, individual school-related regulations and measures) and the **micro-level** (individual persons, person-related measures) (Ackeren et al., 2011). It has also become clear that empirical findings on students' competencies and their influencing variables, which were collected in the past as the primary basis for controlling school development processes, cannot be directly transferred into evidence-based action. Rather, school development processes are influenced by a variety of additional factors such as personal dispositions and routines of the members in the school
system, organizational structures and cultures, specific contextual factors and the structure of knowledge itself (Ackeren et al., 2011). The primary objective of sustainable school development is therefore the establishment of a "capacity for change" (Fullan, 2010), which includes all school members and considers individual contextual characteristics (Rolff, 2016; Stebner et al., 2019).

2. Health and well-being in the school system
It has been repeatedly argued that health and well-being have positive effects on all school members and that health promotion should therefore be considered a desirable goal (Hascher, Morinaj-Turkina & Waber, 2018; Rahm & Heise, 2019; Rathmann et al., 2018). Nevertheless, the scientific discourse in the educational field is still dominated by research that focuses on the description and treatment of dysfunctional processes (Gallant & Riley, 2017; Klusmann & Waschke, 2018; Perryman & Calvert, 2019; Scheuch, Haufe, Seibt, 2015). Although this claim cannot be proven on the basis of current studies and findings (Rothland, 2019), teachers are still ascribed the status of a risk group, as they are thought to have an increased morbidity. Similarly, the health constitution of schoolchildren and older students is pathologized as well (e.g. in the context of G8/G9; Milde-Busch et al., 2010). In contrast to this, at the operational and administrative level (macro- and meso-level), efforts are being made to programmatically anchor positive conceptions of health and well-being as objectives for school development under the model of ‘good healthy’ (‘gute gesunde’) or ‘health-promoting’ (‘gute gesundheitsfördernde’) schools (DGUV, 2017; KMK, 2012; 2014). Digital-based approaches to foster school health have so far been isolated cases and have focused primarily on the individual level (micro-level) (Dreer, 2020). Due to the lack of systematic integration of research, projects and administrative guidelines, cause-effect relationships remain unclear and any targeted, evidence-based management of health-related school development processes remains impossible.

3. App-based evaluation and intervention
The widespread use of smartphones in the last 10 years has increasingly led to much more longitudinal data collection being carried out digitally via apps and less via traditional methods such as paper surveys by mail (Ludwigs et al., 2020a). In addition to saving resources for researchers and participants, app-based surveys have two great advantages:

1) Research apps provide the unique opportunity to conduct fully anonymous longitudinal research and thus avoid distortion effects (e.g. by giving answers with social desirability) (Ludwigs et al., 2019a). This is made possible by allowing the app to receive push messages from the respective device using only a randomly generated code and sharing it with the app
service provider. This code then cannot be personally assigned to the participant any more. However, the code can be used to remain in contact with participants via push messages at all times, for example to inform them about new surveys. In contrast to a merely anonymous data collection, apps make fully anonymous collection of data possible, which is a clear advantage given the confidentiality of the data required in the #H²S project.

2) A second huge advantage of app-based data collection is its matchless speed. Within the software framework of the research app, incoming data sets can almost instantly be evaluated, analysed and directly linked to individually suitable measures of online or face-to-face prevention or intervention (Ludwigs et al., 2019a).

In Germany, the App Research Organization (Düsseldorf) is a pioneer in the development of research apps, especially in the context of health and well-being. Since 2014, the organization has conducted more than 70 app-based research projects, among others in cooperation with universities (e.g. Cambridge University, Freie Universität Berlin, Ruhr-Universität Bochum), public institutions (e.g. OECD, DIW) and large-scale corporations (e.g. Amazon, Lufthansa). Therefore, we are more than happy that we were able to win the App Research Organization as a strong partner for the realization of the research app and the learning platform in our project #H²S.

PROJECT DESCRIPTION

1. Acessing the research field and sampling
A total of ten secondary schools (Sek I) will be sampled via an application procedure under the criterion of diversity (location-related heterogeneity, e.g. socio-economic background of the student population; previous efforts in the context of school development). Schools which already cooperate with the UOS (e.g. in the context of school practical training) will especially be considered. Depending on the number of applicants, we would let the option open to carry out an additional sampling to ensure heterogeneity among the participating schools.

2. Project modules
In order to answer the above risen research questions, the project #H²S aims at carrying out of four subprojects which are assigned to two consecutive modules: the research module (I. Health and well-being - an administrative perspective, II. Health and well-being - school perspectives, III. Health and well-being - individual perspectives of school stakeholders) and the transfer module (IV. Promotion of health and well-being as a topic of digital-based school development). We will further outline these subprojects.
Subprojects I and II focus on a comprehensive analysis of the framework of health and well-being in the school context. For this purpose, document analyses will be done, which will investigate the importance of health and well-being in administrative guidelines of the federal government and the state of Lower Saxony (KMK papers, Lower Saxony School Act NSchG, Lower Saxony Reference Framework for School Quality, Lower Saxony Core Curricula) as well as school-internal instruments for quality assurance and development in individual schools (school programmes, school-internal curricula). Furthermore, in guideline-based interviews with representatives of the educational administration (state school authorities, regional departments) as well as individual school stakeholders (school management, teachers, students) their beliefs about (the promotion of) health and well-being in the school context and on their own role in shaping health and well-being will be investigated. Both the documents and the interviews will be analysed with regard to central concepts, topics and forms of argumentation. This multi-level analytical approach serves to reconstruct relations between intended and implemented curricula at the macro- and meso-level and to derive theoretical implications for governance.

Subproject III concentrates on analysing the characteristics, origins and effects of health and well-being among school stakeholders (school management, teachers, students). Health and well-being are understood as dynamic constructs that include both state and trait components, i.e. they are changeable over time and due to situational characteristics (e.g. Bakker & Demerouti, 2013; Luhmann, Hofmann, Eid & Lucas, 2012; Mayring, 1994). Therefore, an app-based intensive longitudinal research design (Creswell, 2014; Bolger & Laurenceau, 2013) is used for the survey, which bring further advantages: 1) Individual participant accounts will enable the usage of questionnaires via different platforms and devices (including cross-device sync and offline support). 2) Individual requirements and potential obstacles for participation, such as (non-)familiarity with the devices (digital literacy) or the motivation to take part, will be taken into account by embedded tutorials and graphical participant feedback and 3) participant drop-out will be reduced by automated matching of different longitudinal data (e.g. personal, activity and organizational characteristics, knowledge-related competencies in the field of health and well-being). On the content-level, the design of the survey additionally provides insights into

- the longitudinal development of health and well-being during the project period,
possible cross-over effects of health and well-being between the stakeholders in individual schools,
the trajectory of health and well-being as a function of time use, and the interrelationships of knowledge-related competencies in the thematic field of health and well-being, the state of health and well-being, individual performance and school quality. The data collected in subprojects I to III will be summarized in individual and school-related (organizational) $H^2$-profiles, which we will make available to the individual participants or project schools as a working basis within the framework of the transfer module. An automated evaluation procedure will be developed for this purpose.

The transfer module (subproject IV) aims at designing, piloting and evaluating a blended-learning scenario, in which the research results will be to be made accessible for learning and school development processes. In order to expand knowledge-related competencies, beneficial beliefs, strategies of action and reflexivity on the one hand, and to strengthen goal-oriented and topic-centred communication and collaboration between school stakeholders on the other hand, online and face-to-face units targeted at specific stakeholders and at mixed groups will have to be coordinated and thematically interlinked. The design will be based on principles of multimedia learning (Mayer, 2014) as well as theories and findings on organizational development (Selwyn, 2016; Thiel et al., 2019). The evaluation of the programme will be done along the model of Kirkpatrick and Kirkpatrick (2016). In order to reduce participant burden, health and well-being data collected in subproject III will therefore be considered.

An overview on the specific milestones in the #H²S project can be found in the Project Schedule.

3. Sustainability and transfer

Involvement and qualification of emerging researchers: The data that is to be collected provide the basis for a PhD as well as a habilitation project. The required job positions will be assigned as qualification positions accordingly. Student assistants are needed for project work in the context of data collection, processing and analysis (cf. time schedule and budget). This way, university students are introduced to science and project work through the assignment of responsible tasks and close supervision. It is intended that final theses (Bachelor and Master) are written using the data of the project.

Gender and diversity: In addition to the biographical and professional diversity of the project staff as described above, care is taken to ensure that positions are allocated according to competence and gender equality and that the language used in publications and project communication is gender-neutral. In the research itself, location-related heterogeneity (e.g. socio-economic background of the student population, different types of secondary
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schools) is aimed for when sampling the project schools. The individual level of analysis (subproject III) enables the depiction of diversity and its consideration in school development processes.

Transfer potential / Non-scientific cooperation: The project #H²S is characterized by its scalability in the sense of a transferability of the school development concept to other schools. For this purpose, the online learning units will be made available as OER and accompanied by tutorials to facilitate their application and transfer. We also plan to continue a collaborative network with the project schools, which will ensure sustainable school development in the participating schools beyond the project period. The likelihood of successful transfer and sustainable implementation of the strategies and products developed in the project will be further increased by involving the school stakeholders early on in designing and implementing the innovations and examining them with regard to scientific and practical quality criteria. To support this, an advisory board consisting of seven persons as school stakeholders (school management, teachers, students, parents) will be established in the first phase of the project.

Data management, data governance and data use beyond the project duration: During all phases of the project, the research group is fully committed to the rules formulated in the FAIR principles for research data. Accordingly, we will document and provide the scientific community access to our data via gesis and publish our work open access whenever possible. Furthermore, when collecting, analysing, and storing data, we will strictly follow the EU-DSGVO and the BDSG. For more information see Data Management Plan.