EDUCATION FOR SUSTAINABLE DEVELOPMENT.
PERSPECTIVES ON INEQUALITIES THROUGH A DIGITAL SERIOUS
GAME IN HIGHER EDUCATION FOR STUDENT TEACHERS

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Abstract

The background of our project is the 2030 Agenda of the United Nations, which was published in 2015 in the document "Transforming our World". The UN's 17 sustainable development goals are part of the 2030 Agenda, including gender equality, quality of education and climate protection.
ESD and Global Learning have been developed accordingly. They also aim at transformative learning. ESD has received a lot of attention in recent years. It is now a crosscutting task for all teachers in schools in Germany, as they are expected to integrate ESD into their teaching, but this makes it clear that future teachers will have to acquire relevant competences and acquire specific expertise related to ESD in the course of their training. After all, they will be the ones who make future generations co-creators of a sustainable society. ESD is therefore an enormous challenge for the education sector. This is exactly where our project comes in. In an interdisciplinary teaching and research project funded by TU Dortmund University, we are developing a digital Escape Room in which students have to solve puzzles that map dilemmas from SDG 10 (Less Inequality). The BNE[Room] cartography simulates a school building or a classroom in which the students act out different situations. The avatars are student teachers who are confronted with concrete tasks and dilemmas from SDG 10 that can only be solved in an interdisciplinary small group. This is achieved by designing the Escape Room like an adventure game or treasure hunt. SDG 10 is the biggest educational challenge for us, as many students in Germany are disadvantaged. As the students come together from different disciplines, we use the opportunity for interdisciplinary exchange of student teachers, combined with the aim to raise awareness of social inequalities (poverty, inclusion, gender, etc.) in the school context.
Key milestones are:
1. The development of a digital Escape Room (BNE[Room]) for student teachers - including the conception of the BNE[Room] and the development of the storyline. 2. The testing and implementation of the BNE[Room].
2. Testing and implementation with the students, embedded in the seminar context, and
3. The academic monitoring and evaluation of the project.
In summary, this interdisciplinary project aims to implement ESD more strongly in teacher education. A special focus is on the development, implementation and evaluation of the digital Escape Room. The results of the evaluation are based on tests and can be adapted for most relevant SDGs and the interactive Escape Room will be further developed.

Keywords: Teacher education, education for sustainable development, Escape Room, SDG 10, inequalities.

1. Introduction

Due to the current geopolitical, economic and ecological situation, the topic of sustainable living is increasingly becoming the focus of various levels of society. In this context, special importance is attached to education for sustainable development. With regard to the current discussion on Education for Sustainable Development (ESD), approaches and considerations that have already been developed and discussed are used. This can be exemplified by Wolfgang Klafki's critical-constructive didactics. Thus, in connection with the definition of a new concept of general education, he stated that it is of great importance to "gain an awareness of central problems of the present and, as far as foreseeable, of the future, insight into the common responsibility of all in the face of such problems and the willingness to participate in overcoming them" (Klafki 2005, p. 4, translation by the author). In a shortened form, he summarizes this under "epoch-typical key problems" (1996, p. 53) such as "war and peace", "socially

produced inequality", etc. In Klafki's sense, ESD comprises "epoch-typical key problems" that must be "solved" globally, interdisciplinary and morally (Klafki 1996 p. 60 ff). Teachers are ascribed a central role here, as they act in a double didactic sense: On the one hand, the perception of societal transformation processes, and on the other hand, the teaching of future-oriented skills and abilities that enable students to shape their own future. However, this role is never free of contradictions, because people act against their better judgement when they show the will for sustainability but do not act sustainably. On a higher level, this ambivalence is also found in education policy programs, such as the shortage of teachers in Germany, which is to be remedied by low-threshold expansion strategies. At the same time, the postulate of professionalization and quality offensive is being pushed. This contradiction is called the "Attitude Behavior Gap" (Prothero et al. 2011). When arguing from a sociological perspective, the question must be asked how the goal of an explanation of action and an action can be intentional. This requires a reflexive engagement of the subject with the object of sustainability, or as will still be argued here: with the object of social justice. The importance of action (Krieg 2016) becomes all the more virulent the more intensively the issues have arrived in social discourse (Seifi et al. 2012). The debate is thus both a societal task and one that concerns the education system, as societal problems and the transformation to sustainability are only conceivable together (Brocchi 2019 p. V). It is thus a matter of achieving the sustainability goals adopted by the UN and of raising teachers' awareness of social inequalities and developing viable strategies that enable students to effectively shape their lives in a contradictory environment. This raises the question of what is meant by social inequality and why it is important to discuss this in the context of Education for Sustainable Development.

2. Social inequality and (in-)justice

Questions about the causes and effects of social inequality are not new and were discussed even before Karl Marx and Friedrich Engels (ibid. 1848). It should be noted that unequal and thus unjust distribution of life chances has always existed in all historical and modern forms of life. However, the interconnectedness of ecological, economic and social challenges is particularly evident in the current crises. Solga et al. "speak of social inequality whenever people (always understood as members of social categories) have unequal access to social positions and these social positions are systematically linked to advantageous or disadvantageous conditions of action and life" (Solga et al. 2009, p. 15). However, the way in which the unequal distribution of resources (material, such as property, or immaterial, such as power) is viewed depends on the respective epoch (Burzan 2011, p. 7). This is also accompanied by reproductions of inequality structures that manifest themselves in principles of superiority and subordination and are considered socially accepted. Associated with this are recurring questions:

"Is social inequality unjust and must be overcome if possible, or is it at least partly, under certain conditions just and even necessary for social coexistence [...]?" (Burzan 2011 p. 9, translation by the author). Is it enough to know the causes of social inequality in order to point out corresponding solutions for politics, education and society? It becomes clear that if school is not understood as a social space (cf. Bourdieu 1979); structures of inequality are maintained or reproduced largely. Consequently, it is necessary to discuss how prospective teachers are enabled to free themselves from these hegemonic "certainties" in order to be able to deal with them. Furthermore, issues of social justice and social inequality are linked to economic growth on the one hand, but also show up on another level. The findings on child poverty in Germany by the Bertelsmann Foundation 2020 make it clear that more than one in five children under the age of 18 grows up in poverty: "Growing up in poverty restricts, shames and discourages the lives of children and young people - today and with a view to their future." (Bertelsmann Foundation 2020 p. 1, translation by the author). Social participation is thus only possible to a very limited extent, especially since the data suggest that child poverty is establishing itself as a constant factor in the life course of children and young people (Tophoven et al. 2017). However, if one understands school as a place that seeks to reduce social inequality in parts, aspects such as social participation (against the background of the child poverty record) and knowledge about global resources and climate change in school contexts come to the fore. For this, a look at the Whole Institution Approach is suitable in order to perceive contradictions on the one hand and to be able to act despite contradictions on the other.

3 The Whole Institution Approach and the "BNE^Room" research and teaching project

The Whole Institution Approach (WIA) can be mentioned as one way of addressing the ambivalences and challenges already outlined at the institutional level. The holistic approach of a WIA starts with changing a school culture that focuses on participation, transparency, mindfulness and the individual potentials of the students (Birkel 2021, p. 120f). Crucial for a change in the educational context is the teachers' scope of action to enable participation and cooperative collaboration of teachers in the

school system and thus also in relation to the students (Birkel 2021 p. 123f). In the medium and long term, not only the school system but also actors in non-school education, politics and civil society need to be taken into account. This is because social inequality, if one takes the common social structure analyses as a basis, is a mixture of class characteristics, gender, ethnicity, age, religion, etc., which are theoretically treated in their respective references but have little relationship to each other (Schwinn 2007 p.88). WIA must therefore take into account the context of a diversity-sensitive society if it is to live up to its claim of striving for sustainability as a development goal at all organizational and institutional levels and thus anchor it in social processes, negotiations and discourses. However, WIA must not remain on a theoretical-discursive level - it is about empowering people in organizations and institutions to act in the spirit of sustainability. This applies in a double didactic sense: education for sustainability as a topic and with regard to a sustainable organizational culture, such as resource use, diversity or an appropriate culture of participation. One approach on how this interweaving can be established is the project "BNE[Room]", which is presented in the following.

3. Interdisciplinary research and outreach project: "BNE[Room]" and the structure of an Escape-Room-Based teaching unit and research approach.

For this interdisciplinary project, we are developing a digital Escape Room. An important aspect of the project is to bring the future teachers together across disciplines. They draw on different knowledge bases and try to work on the tasks set in dialogue. In the accompanying research, we focus in particular on the negotiation processes of the student teachers. The following research questions are guiding:

1) Which different educational and learning processes can be triggered in the students with BNE[Room] (subject-related, didactic and action-oriented transformation processes in relation to ESD)?

2) How can mechanisms of action of BNE[Room] be identified in terms of processes (different measurement points)?

In order to answer the research questions adequately, we follow a social constructivist logic. Since all three-project leaders come from different disciplines, both content-related and interdisciplinary prerequisites are given. In the "BNE[Room]" project, the seminar structure will consist of three parts. In the first part, the topic will be introduced to the respective teacher training programs from a subject-specific or educational science perspective. The students will work within their subject discipline (in our case theology, vocational education and educational science). Then the whole group is divided into interdisciplinary seminar groups. The Escape Room is used and explored, with the students complementing each other due to their different disciplines. The third part consists of reflection in seminars in their own subject. Here, the student teachers have time to exchange ideas and clarify what worked well and what did not. At the same time, the experiences with the Escape Room are used to derive initial ideas for conceptual and pedagogical-didactic action in the school and to establish a reference to an emancipatory ESD. Within the framework of the accompanying research, a Designed-Based-Research approach (DBR) is applied, which enables the further development of teaching-learning arrangements and a discrepancy experience in pedagogical practice is important as a starting point for the approach (Reimann 2022). It is precisely this focus on a school problem that is taken into account in the development and evaluation of the Escape Room with the theme SDG 10 "Reduce inequality". The Escape Room enables student teachers to learn together how to deal with challenges on this topic. It can therefore be understood as an intervention within the framework of the accompanying research. In educational science, DBR can be classified as developmental research in the field of practice research, so that its goals are often bipolar, according to Lehman-Wermser and Konrad (2016). On the one hand, it aims to solve relevant problems from educational practice (here: reducing inequality of opportunity in the education system) and, on the other hand, to produce results that contribute to theory building (here: Benefits and limitations of implementing a digital escape room on ESD in teacher education). In order to evaluate the digital Escape Room, students will be surveyed with questionnaires in a pre-post design. In addition, the students will be filmed while using the room and during the subsequent group discussions about the results of the Escape Game. This is done in the "Labprofil" of the TU-Dortmund (https://doprofil.tu-dortmund.de/labprofil/), which has the appropriate technical equipment. The aim of analyzing this data is to evaluate how effective the dilemma situations are for the empowerment of the students. At the same time, insights into the inner structure of the students' negotiation skills are to be gained and the (interdisciplinary) knowledge they claim is to be recorded. Against this background, the evaluation will be evaluated according to the documentary method (Bohnsack 2021).

4. Conclusion and outlook

In summary, the interdisciplinary project "BNE^Room" in teacher education aims to anchor ESD more firmly in teacher education. In doing so, it takes into account the fact that ESD changes school and university educational processes. Accordingly, teacher education must also change in order to provide future teachers with the skills and abilities they need to meet the challenges in education. Interdisciplinary exchange contributes to this just as much as sensitization with diverse categories of difference. A first questionnaire survey among all participating students has already shown that the topic of ESD is classified as underrepresented in the study programme. We can thus confirm the results of Rieckmann and Holz (ibid. 2017). In addition, all respondents are of the opinion that ESD is particularly important as a subject. When asked who is responsible for the implementation of ESD, an overwhelming majority shows that the implementation should follow a top-down strategy. It also shows that the student teachers surveyed have little to no competence in dealing with digital Escape Rooms, which on the one hand increases the willingness to participate in the project and on the other hand underlines the urgency of linking educational offers and digitally. The first evaluation shows the importance of the project on almost all levels and therefore encourages us to continue working on it.

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