**How are participatory Education for Sustainability (ESD) projects influencing sustainability competences of high school students?**

* Need for sustainability competence
  + Ongoing/ worsening problems
  + Behaviour- knowledge gap
  + Importance outcome orientation
* Effectiveness of Sustainability competence depends on the type of educational intervention
  + Very mixed results (knowledge up, behavior/ attitude did not increase)
  + 🡪 empirically looking at projects which apply those effective methods
  + ESD now in schools and local education plans, with mixed effects
  + 🡪 looking at schools were specific ESD program was carried out
* Sustainability competences depend on the scale and metric of observation// outcome orientation requires clarity about the goals which are targeted
  + goal orientation through local education plans 🡪 in case of outcome measurement, precise goal (content) specifications and operationalisations are necessary
  + good outcome measurement needs validity criteria (self-efficacy as validity?)
  + trade-off regional specificity and aim of getting broad picture of state of play and development
  + 🡪 importance of outcome orientation
  + 🡪 Long vs short-term
* Sustainability competence and its attribution to education intervention can be assessed through different methods, each with its own advantages and disadvantages (need for operationalisation?)
  + 🡪 importance of empirical data that uses three dimensions and can be related to project?
  + attributing effectiveness of intervention can be assessed by looking at involvement of students (can level of involvement already validate the indicators?)
  + 🡪 effectiveness of intervention is dependent on impact and should therefore still be monitored throughout and after project
  + 🡪 established survey
* Sustainability competence interplays with real environment and feeling of self-efficacy
  + Question is whether behavior can and should be a goal of ESD interventions?
  + 🡪 focus on self-efficacy as better outcome indicator?
  + 🡪 effectiveness of intervention is dependent on impact and should therefore still be monitored throughout and after project
  + 🡪 need for long-term impact focus?
* Output orientation calls for long-term assessment and other additional methods to evaluate impact
  + 🡪 possibility for both short and long term impact by assessing at different project stages?
* Sustainability competence can be validated by including other measures.
  + 🡪

# Introduction

Globally, we as humankind are facing many ecological and social crises at the same time. To address these challenges, there is strong scientific agreement for the necessity of collective pursuit of ecological and social aims. Many people obtain from acting together against climate change or social inequalities because they do not feel they or their group can make any difference. Understanding how people come to feel human agency and the belief that they can achieve something, in terms of individual and collective self-efficacy, plays a crucial role in motivating people to act. Motivating young people is especially important. It is not only their future that is expecting many uncertainties and changes, their interests should already now be taken serious and be included. By taking their ideas and aims serious and giving them spaces of opportunity to shape their surroundings, we can foster empowerment and motivation to act together as young people. One very present environment for young people is the school. Participative Sustainable Development Education (SDE) projects are a promising opportunity for both: creating this space of opportunity to influence their surroundings, while at the same time learning and experiencing to act together. When designing ESD projects it is important to understand the complexity modes of action in order to be able to implement good educational interventions. We currently only have a limited understanding of how participative Education interventions such as ESD-projects, as potential enablers , are contributing to self-efficacy beliefs in students.

Within reports and recommendations on SDE, it is common convention, that certain methods and approaches are appropriate to reach the goals set out. These methods include participative learning, self-induced learning, project work, voluntarism with the aims of achieving critical thinking, system thinking, and so on. Innovative, service-learning, portfolio-work, project work, roll- and plangames, problem-based learning (REF RIEß et al, 2021/ Rieß et al 2022 VORLESUNG1). However, until now, empirical data on the impact and outcome of ESD interventions within educational settings exists very little. Some of the challenges of assessing the impact of ESD interventions include the operationalisation and measurements. Lessons learnt so far are the agreement on the broad tripartite classification of ESD goals in terms of achieving competencies in the knowledge, attitudes, and behavioral dimensions (Waltner, application-oriented). (SW AS COVERING ALL OF THEM?). 🡪 precise goal (content) specifications and operationalization are needed in order to capture the underlying construct.

Do we need not only a shift from the input to the outcome orientation in the analytical/evaluative perspective but also a shift of attention from the purely cognitive to the behavioral components of SCs?  
When aiming for global indicators which are easily replicable and comparable, detailed observations need to be sacrificed. Consequently, additional qualitative studies looking into further details of the SC development process would represent a useful complement.  
So far, empirical research in that area, has focussed mainly on Climate attitude and behavior. However, these components ignore the aspect of creating spaces of opportunity to influence their environment (as participatory and experiential learning) which could be seen as combining cognitive, behavioral, and emotive components in its measures. Empirical research on whole school approach? Relevance of empirical data, analysing SDE interventions, which consider operationalisation and include in its measurement beyond cognitive measurement and gain of knowledge.

Considering increased self-efficacy through participatory and experiential as an aim of SDE interventions brings up the question of operationalising measurement of self-efficacy as well as its relation to pedagogical approaches and which other factors might influence it. Recent theoretical developments have emphasised the importance of differentiating and including agents, actions and aims and different connections when analysing self-efficacy related within ecological and social context. Furthermore, the desirability of the aim and aim content might play a central role, when analysing self-efficacy. So far, research has focussed more on individuals and has not yet considered the influence the environment (Whole School Approach) can play.

# Objectives and research questions

Ich werde den Einfluss von partizipativen BNE-Projekten auf SW-Überzeugungen von SuS untersuchen. Kürzliche theoretische Weiterentwicklungen von Selbstwirksamkeitsüberzeugungen bieten eine neue Möglichkeit die Wirkung von partizipativen BNE-Projekten dahingehend zu untersuchen. Durch die Integration des neuen theoretischen Triple A-frameworks of self-efficacy beliefs auf ein partizipatives BNE-Projekt bietet meine Analyse Einblicke in den Einfluss von Projektdesign als potenzieller Einflussfaktor auf die human agency von SuS.

* Do students with higher level of involvement in the ESD project experience more changes in climate attitude and behaviour over time than students with lower levels of involvement?
  + How does the project evolution influence the magnitude of the changes in climate attitude and behaviour?
* Do students with higher level of involvement in the ESD project experience higher (collective and individual) self-efficacy beliefs than students with lower levels of involvement?
  + How do desirability of the aim and group identification influence the magnitude of the self-efficacy beliefs?
* How are changes in climate attitude and behaviour influenced by (collective and individual) self-efficacy beliefs?

# Research hypotheses/ predictions?

# Methods

In my analysis I ask how the level of participation of a participative SDE-intervention influences the individual and collective self-efficacy beliefs. I assess variation in agent-action-aim and agent-aim self-efficacy beliefs at different project stages across schools. To quantitatively and qualitatively test the impact of SDE-interventions, I will gain data by surveys and interviews.

## Databases

### Survey

# Proposed timetable