



## Disentangling challenges and needs for an effective climate education

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Understanding climate change and its impacts is a key element of the United Nations Global Initiative for Education for Sustainable Development (ESD) (UNESCO 2016). The last decades have shown that technical innovations and certain political actions alone do not lead to sustainable limits. Therefore, appropriate educational approaches and tools leading to a more comprehensive understanding of climate change and sustainability are considered essential today. Unfortunately, this means that different subjects and different recipients – from primary school to upper secondary level, vocational schools and their teachers – have to be addressed individually. When analysing their needs and interests, two overarching facets can be observed. While – on the one hand – the use of digital media and tools (ICT) is self-evident for pupils (digital natives), this is often an obstacle for teachers (digital immigrants). On the other hand it is increasingly used for educational purposes as it promotes autonomous learning, reduces complexity or contributes to problem solving (Neset et al. 2016). In a series of workshops and by analysing existing ICT tools (cf. e. g. Klimafolgenonline-Bildung.de or my2050.be) we have found that modern digital media have a high level of acceptance and bring a great variety to teaching. Nevertheless, the capacity of ICT tools could be better exploited and improved by identifying the specific target group, its skills and concrete learning objectives. To this end, new and intelligent ideas and tailor-made concepts are needed, which should fulfill certain conditions: e. g:

- Be clear about your target group, each of them need different designations.
- Improving information literacy, i.e. improving the ability to search, retrieve and analyse information.
- People do not like negative messages, be “edutaining”, i.e. taking positive action to mitigate climate change.
- Do not try to convince the convinced and be prepared of the self-preferentiality of deniers.

By evaluating information portals, (cf. above) and systematically analysing workshop outcomes it can be shown how learning could be further accelerated and qualitatively improved, e.g.:

- Complexity on demand, i.e. users should not overloaded by information, but shall have control how deep the like to dive into a context.
- For a concrete problem context interrelations to individual embedding should be made visible (“story-telling”, cf. Theodorou et al. 2019).
- Problems should be anchored in the past/present and alternative futures need to be made clear in an emotionalizing way. For this new and better stories must be invented!
- Emphasize the individual scope of influence in problem solving.
- ICT tools need always accompanying and background materials (Teaching and learning materials) which can be used for mutual learning (dialogue) purposes.

Summing up our results show that a mixture of target group oriented education concepts, movies, games, online tools and tutorials are a key for a successful teaching approach.