Stimulating Collective Transformative Learning Experiences with an ESD Whole-School Assessment Tool

ARTICLE

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ABSTRACT

This exploratory research is a contribution to the overall movement which calls for a transformation of educational systems towards value-based and sustainable education learning paradigms. It is an attempt to offer an alternative perspective on school assessments and certification processes by connecting transformative learning and the whole-school approach in an Education for Sustainable Development context. The results of the research are based on secondary analysis of literature, surveys with students and practitioners and a focus group discussion. By deducing six key elements from the data which should be incorporated in assessment tools to stimulate transformative learning on a school level in K12 education, the study results offer ideas on what to incorporate in future school assessments. To stimulate transformative learning in educational institutions whole-school assessment tools should be based on (1) a clear learning paradigm and value framework, (2) should foster relationships and contribute to a sense of community, (3) encourage reflection and introduce a systems thinking mindset, (4) make learning a meaningful experience relevant also for the personal life outside the school, (5) foster dialogue and collaboration inside the school and across institutions, and (6) require action post-assessment.

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BACKGROUND

As the world experiences the fourth industrial revolution, educational systems are required to prepare students for the emerging future. A changing world requires new skills. Primary and secondary education play an important part in preparing future generations which calls for an adaption of educational practices and models (World Economic Forum, 2020). If educational practices change, so must assessment processes, for schools and the individual learner. According to Salleh, Mahmud, Joorabchi, Amat, & Hamzah (2017), there is no tool available to schools worldwide measuring values in a school context. Generally, there is a lack of assessment tools in the areas of future oriented, emerging educational practices, Education for Sustainable Development (ESD) and innovative education approaches (UNESCO, 2019; World Economic Forum, 2020). Others, such as Crowell, advocate for a meaningful learning process that enhances learning, the learner's awareness, and a school culture that "brings life and focus to its activities" while criticising the deficit-oriented assessment approaches and fragmented learning instead of inter-and multidisciplinary (Crowell, 2017).

TRANSFORMATIVE LEARNING

Jack Mezirow (1985; 2006) coined the Transformative Learning Theory (TL) in the context of lifelong and continuous learning. This theory, the metatheory of this research, has its origin in adult eduction, where it has been used for several decades as a common approach (Hoggan, 2016; Illeris, 2014; Taylor, 2007). Taylor`s (2007) review of empirical research on TL shows that even though much research on TL is conducted there are several elements in the transformation process that scientists yet must understand. The assessment and evaluation of the learning process pose an issue to the integrity of the theory which is accused of lacking advancement in the last decades (Romano, 2018). Even though the theory is widely used and incorporated into education practices the theory itself is still evolving and many concepts must still be investigated, defined, and tested.

Nevertheless, research agrees that TL is a process of building awareness and consciousness (Crowell, 2017; Illeris, 2014; Taylor, 2007) which eventually contributes to building the identity of the learner (Illeris, 2014; Taylor, 2007). It goes deeper than cognitive learning experiences and affects the learner as a whole being, valuing the individual learning experience. TL assumes that "meaning is individualistic and found inside the learner and teacher rather than prescribed by external influences such as written texts and speeches; however, that meaning becomes significant to the learner through critical discourse with others" (Kitchenham, 2008, p. 113). The approach assumes that intrinsic motivation and the learner's interests are key to learning (Illeris, 2014). It is a complex and multifaceted learning process (Kitchenham, 2008). An essential part of the process is experiencing cumbersome situations and feeling discomfort when needing to position oneself based on new knowledge (Willink & Jacobs, 2011) or experiencing conflict with self or others (Boström et al., 2018; Buechner et al., 2020). Such situations arise as the learner challenges its beliefs (Buechner et al., 2020) which can lead to a temporary feeling of identity loss as the transformation affects worldview, beliefs, and values. Trust in the transformation process, equal power balances between the learners to stimulate learner autonomy and trust-building (Taylor, 2007) are important so learners do not feel alone in the process. Here, the social aspect of learning becomes evident. Compared to mainstream education, TL is less prescriptive, shows flexible characteristics which aim to serve the individual and stimulate deep learning experiences and offers support during the process. It focuses on the subjective experience of the learner suggesting that there is not just one way of learning because the internal process of the learner remains hidden and difficult to measure and assess. For assessing transformative learning methods such as self-evaluation, interviews, narratives, journals, art-based techniques, and metaphor analysis are suggested (Romano, 2018). However, they are designed to assess TL on an individual level which makes them difficult to implement on a school level. However, there is consensus on using innovative, qualitative, or mixed methods (Bosevska & Kriewaldt, 2019; Goldman, Ayalon, Baum, & Weiss, 2018; Romano, 2018; Salleh, et al., 2017; UNESCO, 2019).

THE WHOLE-SCHOOL APPROACH

The TL theory alone does not offer the necessary theoretical complexity for this research. The theoretical framework is extended to the school level by incorporating the whole-school approach

(WSA). The approach is especially relevant in an Education for Sustainable Development (ESD) context, or transitions towards institutional sustainable practices (Bosevska & Kriewaldt, 2019). According to the International Bureau of Education, it "involves addressing the needs of learners, staff, and the wider community, not only within the curriculum but across the whole-school and learning environment. It implies collective and collaborative action in and by a school community to improve student learning, behaviour and wellbeing, and the conditions that support these." (para. 1). Researchers additionally consider parents important stakeholders of a whole-school community (Buechner, Dirkx, Konvisser, Myers, & Peleg-Baker, 2020; Goldberg et al., 2019; Mogren, Gericke, & Scherp, 2019) while others additionally propose the involvement of the local community (Kensler, 2012; Mogren et al., 2019; Wals & Benavot, 2017). The involvement of parents and the wider community ensure the representation of local aspects to create a coherent learning environment. Kensler (2012) argues a WSA is not only teaching sustainability via curriculum but encouraging school communities to learn together and live more sustainably. One sees the school as an operating, living system where ecological principles are used in an educational context to guide institutional change. A democratic organizational approach within the school is important to foster learning and innovation, engaging individuals by experimenting and creative work (Kitchenham, 2008). Bosevska and Kriewaldt (2019) suggest that "sustainability realisation requires vision, design and action, integrative and transformational processes, new language and on-going reflexivity. The aim must shift from education and school reform towards recontextualizing the whole vision of education: schools and communities working together to shape the meaning of a sustainable future" (p. 70).

EDUCATION FOR SUSTAINABLE DEVELOPMENT

Complementary to TL and WSA, researchers in Environmental Education and ESD call for more diversity-based, holistic, and locally tailored education programmes, teaching practical knowledge and providing hands-on learning opportunities (Wals & Benavot, 2017; Leicht, Heiss & Byun, 2018). UNESCO (2019) defines the ESD as "integrating critical issues" (para. 2) in the curriculum, and "designing teaching and learning in an interactive, learner-centred way that enables exploratory, action-oriented and transformative learning" (para. 3). It aims to "stimulat[e] learning and promot[e] core competencies, such as critical and systemic thinking, collaborative decision-making, and taking responsibility for the present and future generations" (UNESCO, 2019, para. 5).

METHODOLOGY

This study aimed to explore the key elements whole-school ESD assessment tools should contain to stimulate transformative learning on the school level in K12 education (see research questions in Appendix A). Within this research, the term key elements denotes the most important elements in the specific context. Quotes from research participants are encoded to ensure their anonymity consisting of an abbreviation of the country they work in and for their gender.

For this study pilot version of the Earth Charter School Seal (ECSS) material was used. It served as an example, for a whole-school ESD assessment tool and reference for this study. It is a, yet unpublished, value-based assessment tool for educational institutions and a response to the lack of school assessment tools. It measures the inclusion of ethical values, TL, and the whole-school approach for ESD in a school's practices. It is a novel approach embracing the future-oriented and holistic paradigm in the field of education. The assessment is designed for the process to be a learning-, and reflection-experience on the whole-school level. It aims for post-assessment improvement of the schools' practices, on the individual and collective level. Through the self-assessment, the school becomes aware of its practices, values and culture and takes time to critically assesses whether it represents what it wants to stand and advocate for. It should mark the beginning of a new learning process and go deeper than solely assessing the school to obtain recognition. The assessment consists of a form to assess the school's performance and practices measured according to eight indicators assessing the school and its practices. Additionally, a student questionnaire for primary and secondary students includes the student's perspectives in the assessment. Examples of the material cannot be provided due to a privacy agreement with Earth Charter International.

DATA COLLECTION AND ANALYSIS

The data was collected using multiple phases (see ***Figure 1***), three different data collection methods and including different stakeholder groups. The research emphasizes qualitative data, so the focus was on identifying thematic patterns across the entire data set rather than summarising the data (Braun, Clarke, Boulton, Davey, & McEvoy, 2020). First, the data from each phase were analysed separately. Then, data from the different collection phases were combined, looking for connections and relationships to extract the most important reoccurring elements from all data sources. Through the sequential data collection and analysis, the existing knowledge was constantly adapted. This contributed a more complete, multifaceted, and holistic picture of the topic to live up to its complexity.

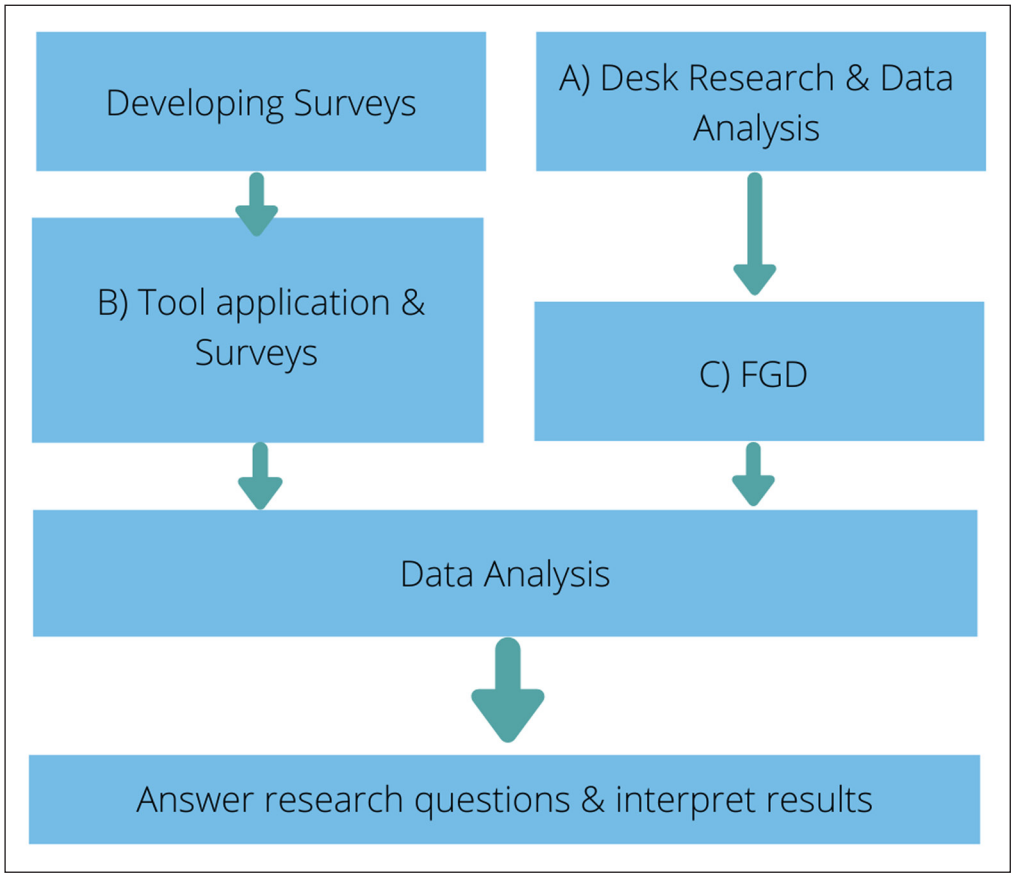

Figure 1 Order of Research Phases.

Phase A – Desk research

The desk research was conducted using secondary literature. Fifteen scientific articles and reports related to the relevant theories and concepts (see previous section) were reviewed using thematic content analysis. By identifying patterns across the data set the goal was to synthesise the information and deduce central elements (CEs) of the TL theory and the WSA. It additionally deepened the theoretical understanding of the topic to ensure a substantial theoretical foundation of the research and helped to compose the surveys (phase B) and prepare the FGD (phase C). The overall selection of articles for the desk research was based on the use of terminology and criteria as listed in Appendix B.

For the thematic content analysis relevant sections were marked, then assigned to themes or keywords, which were grouped based on thematic connections and similarities later on. To avoid unintended coding-strategy shifts terminology was carefully tracked to frame the content of each theme. Several themes were summarised to deduce the central elements. The challenge was to define the boundaries between the different elements as they were interconnected, picking up the same central concepts in different contexts. The applicability of the central elements was checked by reviewing the secondary literature from which they were derived to avoid the abstraction of information. The references of the analysed articles are listed in Appendix C.

Phase B – Tool application and surveys

To generate experience-based data, participants from four different schools, based in Costa Rica, Austria, Dubai, and Australia, completed the material and tools of the Earth Charter School Seal assessment. The schools were selected based on their willingness to participate and complete the material without contact to the researcher, following the instructions provided with the material. By generating data in different geographical areas several cultural backgrounds and contexts were included in the data to ensure the applicability and usefulness of the results in an international context. The experiences, ideas for improvement, insights and learnings of the participants were collected using follow-up surveys (see Appendix D for a copy of the teacher survey and student survey). The tool application ensured the incorporation of participant feedback and ideas, based on practical experience. Teachers and students received different surveys. The ECSS results were not further analysed. They only provided a practical case to help the participants generate ideas for improvement and to measure their experience with such a tool. The distribution of participants per geographical area are shown in ***Table 1***. All surveys were conducted online without direct contact with the respondents. The data collection phase took approximately seven weeks. The students who completed the primary students survey were between ten and thirteen years old (primary school age differs between countries), the ones who completed the secondary ones between 16 and 18 years old.

COUNTRY	NUMBER OF SURVEY PARTICIPANTS			TOTAL
Austria	Teacher: 1	Primary Students: 0	Secondary Students: 1	2
Costa Rica	Teacher: 1	Primary Students: 2	Secondary Students: 0	3
UAE (Dubai)	Teacher: 1	Primary Students: 1	Secondary Students: 2	4
Australia	Teacher: 1	Primary Students: 1	Secondary Students: 0	2
All	**Teacher: 4**	**Primary Students: 4**	**Secondary Students: 3**	**11**

Table 1 Participant overview.

The student-survey responses were reviewed and related to the central elements from phase A, which served as pre-defined codes (see Appendix E). Where needed hybrid coding was used, the CEs extended and adapted based on the new insights (see Appendix F). Then, sub-categories within each CE were applied to structure the data and identify patterns. The student-survey results served as an inspiration for the FGD and mostly did not provide elaborate answers. However, they offered another perspective to the researcher, creating a more complete picture of the topic. The more complex and elaborate teacher-surveys contributed proportionally more to the research. Teacher-survey data was coded based on the Central Elements. Within the CEs the data was organised based on the relevance for each sub-question by using colour coding (see Appendix G). Then, hybrid coding was applied again. The survey responses aligned with the central elements generated in phase A. Patterns became visible and were substantiated by quotes from the respondents.

Phase C – Expert focus group discussion

This phase builds on the insights of phase A. The sample for the focus group discussion (FGD) was drawn by using purposive sampling, selecting participants based on their willingness to participate and relevance of the professional and/or academic background. Individuals with field knowledge or (academic) certification in education, ESD/EE/SE, whole-school assessments or approaches and knowledge on the theories and concepts of this research's conceptual framework, were considered relevant. Four individuals participated, all female, with different cultural backgrounds, working in three different countries. Additionally, the mentor of the researcher was present in the FGD supporting the facilitation asking a few questions for clarification on the statements of the other participants and sharing experiences. Her statements were relevant in the research context, so her statements were included in the analysis. Two of the four participants were familiar with the ECSS tools. One also participated in the tool application and survey of phase B. The group was diverse with different professional backgrounds, different levels of experience and knowledge about the ECSS. The diversity of the

sample was to ensure a variety of ideas by including different perspectives and stakeholder groups and to obtain unbiased input from the participants who did not work with the ECSS tools. The FGD was recorded and transcribed. Additionally, the researcher took notes and wrote down her observations on how the participants interacted and communicated with each other.

The information got marked regarding the relevance for the research questions, using the same scheme as for the teacher-surveys in phase A (See Appendix H for an excerpt of coded transcript). Then, patterns were identified based on keywords that reoccurred throughout the discussion while referring back to the relevant CEs, placing the information into a larger context. As the data from the FGD was analysed last, findings could be related to the conclusions phase A and B. By doing so the answers to the research questions were derived as outlined in the following sections.

RESULTS AND DISCUSSION

The following sections build upon one another to deepen the understanding of the topic step by step, to then comprise a comprehensive answer to the research question.

CENTRAL ELEMENTS OF TRANSFORMATIVE LEARNING ON A WHOLE-SCHOOL LEVEL

The central elements (CE) are derived from combining the overall theory of TL and the WSA to education in an ESD context. As explained previously, both approaches to learning align on a fundamental level. The elements are interconnected and must be considered together to properly describe the complexity of the transformative learning process on a whole-school level. Through reinforcing and interacting with one another the elements build an integral and organic concept with emergent properties. All elements contribute to the transformation on the individual, collective and organisational level towards sustainable practices and an altered way of being in the school context.

1. Guiding concepts: Systems thinking and ecology

Systems thinking, and the concept of ecology are guiding concepts for TL and the whole-school approach. Their implementation on a school level stimulates fundamental transformation and fosters the understanding of complexity, global-oriented education and interdisciplinarity. Ecology is an analogy for all aspects emphasising the complex relational aspect of learning, the interconnection between individual and collective learning, and the structure of a healthy school community. It also illustrates the ideal approach to management and the importance of the natural environment for learning, its protection and sustainability practices on campus. It is the framing concept for all practices of TL on a whole-school level and embodies the organic and natural aspects of learning. Systems thinking supports that notion and helps to understand the concept of ecology. It marks the beginning of a TL process as it introduces different perspectives to the learner, eventually leading to a more complex understanding of reality.

2. Inseparable and interconnected learning entities

The individual, social and organisational aspect of learning have their own dynamics but cannot be conceptually separated. Individuals are interconnected and together compose the school collective (see ***Figure 2***). The individual and collective learning experience are connected through meaningful and trustful relationships and shared experiences between the learners. The relationships are coined by equal power distribution, meaning that teachers and students learn with and from one another. The relationships evolve organically and interconnect the members of the school community like an ecosystem. From this arises a school culture and community feeling. The acknowledgement that everybody has something to contribute fosters an interactive learning dynamic and synergy among learners. Together the learners engage in collective sense-making and create collective knowledge which is reflected in the school culture and a shared identity. The individual, as well as its community, feel part of something bigger giving them purpose and stability to work through the difficulties of the learning process. This is a crucial aspect of the interconnection between individual and collective. The social environment created through the relationships acts as an educator and informal curriculum

and influences the individual. The transformation process starts on the individual level and moves to the collective level. Personal and collective identity (re-)formation is a crucial part of the TL process, resulting in a change or adaption of beliefs, values, purpose, and behaviour. The interaction between the individual and the social environment create meaningful learning experiences which go beyond cognitive understanding.

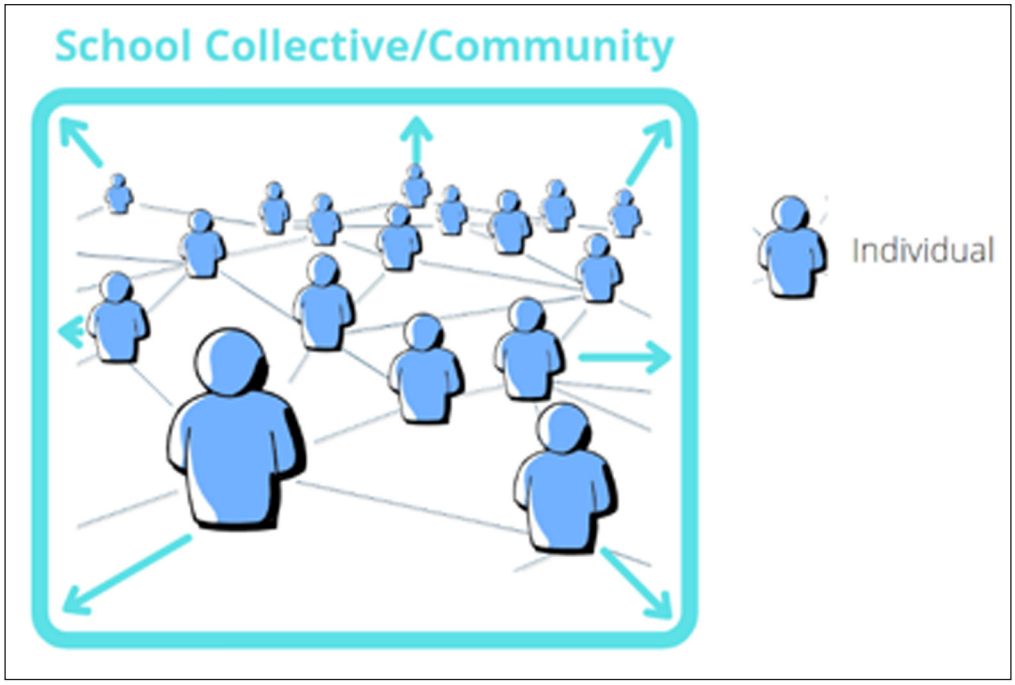

Figure 2 Illustration of interconnection between individual and collective.

3. Learning environment: Culture, community and context

The learning environment is shaped by the school- and learning culture. The culture should arise from collaboration, a common ethos, and a shared vision. The taught values are lived in daily school life, reinforcing the school vision and values. Learning becomes a part of being. Local culture, such as indigenous knowledge, local context and the wider community of the school should be involved in the learning process. This encourages learning beyond the classroom, across groups and ages, creating space for diversity that supports the learning process. It also creates relevance for the learners as they can relate the education to their direct environment. Through stakeholder collaboration across the school and partnerships with local agencies and other schools, learning takes place on a school level including parents, students, staff, and teachers. Collective spaces on the school ground are important for community building and offer an opportunity for shared experiences. The overall physical and social learning environment gives learners stability and security while offering space for interaction which can contribute to transformation on the individual and collective level.

4. Fundamental transformation

In a successful transformative learning process on a school level the individual and the collective experience a permanent, fundamental transformation or dramatic shift in worldview, ontology, and epistemology. This impacts and involves the affective, behavioural, and cognitive learning dimension, resulting in a more complex and comprehensive (shared) worldview, a shift and alteration of consciousness, a reorganised (shared) identity, understanding beyond the cognitive level and more open ways of knowing. The transformation is irreversible but can be altered and adapted further along the learning process.

5. Learning paradigm: Gradual, holistic and integral learning

Learning is approached as a gradual, iterative, and fluid process that is different for every individual, fuelled by intrinsic motivation. Discomfort, confusion, and resistance are natural parts of the non-linear learning process. This arises when learners are confronted with new, diverse, and conflicting information which does not fit their current frame of reference. Crisis

and conflict are a way to create meaning and are not perceived as violent disturbances. The discrepancies between information stimulate reflection and critical thinking. As a result, the learners may adjust their positionality and experience a transformation in how meaning is made. There is room for using holistic approaches and the integration of new concepts in the learning process if they contribute to a meaningful learning experience allowing unexpected interaction between diverse elements. The transformation begins with the individual and is extended to the collective level where it is manifested and embodied in mutual understanding, shared identity, and norms. Learning is directed at the whole person, including the affective, cognitive, and social dimensions of learning. They are equally important and enforce each other.

6. Social agency

The learning process stimulates the learner's agency for cultural, systemic, social, behavioural, and institutional change and transformation. That agency is future-oriented and challenges existing structures and power systems. Action follows the transformative learning experience and manifests the learning process in the experienced reality of the learner. An entire school is a unit of change encouraging empowerment and responsibility. The school- and learning culture promote individual and collective agency. From this emerges social agency which becomes a central part of school life. It is practised daily and is expressed through joint action. By engaging in real-life challenges and acting upon individual interest the learners are introduced to a meaningful approach to learning and change. Improvement for the community can be achieved by taking local action and contributing to strengthening the school community.

7. Pedagogy: Skill-oriented, practical and student-centred

Education is flexible and experience-based, student's needs and interests are always central. Education is focused on interdependent skills, competence and capacity development fostering problem-solving, reflection and critical thinking on a social and emotional level. Through using practical, context-bound, and inquiry-based learning while using participatory pedagogy the application of attitudes, knowledge and skills are stimulated. This encourages altered awareness, consciousness, and openness. It furthermore enables a meaningful and purpose-driven learning experience. Personal growth and identity development, as well as social learning, are equally important with cognitive and factual learning. New, creative forms of evaluation and demonstrating knowledge, such as self-evaluation and non-evaluative feedback, facilitate an individual and autonomous learning journey and align with the paradigm of an ongoing and iterative learning process. Critical dialogue, discussion and interaction between the learners and the wider school community encourage horizontal, communal, and intergenerational TL experiences and knowledge creation.

8. Management: Purpose-driven, shared leadership & integrated policies

The school management is long-term oriented and driven by the school's collective vision and values. Efforts are made to create a physical and emotional learning environment (see CE 3) that reflects and enforces the schools' values and practices. The school management operates so the infrastructure and the culture are in line with the school's values. It is the management's responsibility to ensure that all the requirements for TL on a whole-school level are fulfilled. Furthermore, leadership practices should be coherent, participatory, and democratic, engaging students and all staff to create lasting change and contribute to the school's vision and community building. This is achieved through school-wide coordination, shared leadership, and shared responsibility. The policies are value-based, enforcing the school's goals and values. The school community lives and embodies them in daily life and culture, manifesting sustainable and inclusive practices. The institutional hierarchy is low or horizontal to enable bottom-up practices and encourage participation.

9. Curriculum: Global-oriented, interdisciplinary and value-enforcing

The curriculum reinforces the culture and embodies the humanistic and ecological values of the institution. It creates consistency across all aspects of learning and being. Subjects are multidisciplinary using systems thinking as an approach to introduce complexity and uncertainty. The curriculum should stimulate learning beyond the classroom and global-minded critical

agency by revealing the link between local and global issues. By using outdoor education and phenomenon exploration classroom topics connect to the environment of the learner. This encourages the learner to identify and reflect on its position in a complex environment but also ensures the previously addressed relevance of the knowledge. The student-centred curriculum should strengthen the new understanding through practice, giving space for learner autonomy and flexible pedagogical approaches. It is designed so learners gain knowledge and skills that can be applied in various contexts, providing them with valuable tools to navigate in a complex world.

The nine CEs give a comprehensive overview of the underlying practices and assumptions this research aims to integrate into whole-school ESD assessment tools. They introduce the complexity of the transformative learning process on a school level and contribute to a fundamental understanding of the important aspects. The elements bring attention to the implicit, yet important connections between the different aspects.

INCORPORATION OF TRANSFORMATIVE LEARNING ELEMENTS IN WHOLE-SCHOOL ESD ASSESSMENT TOOLS

The nine CEs are not directly related to whole-school ESD assessment tools (from now on referred to as assessment tool, tool, or assessment). Therefore, this section focuses on how to incorporate the CEs into assessment tools using a participatory grassroots approach as an entry point to conceptualise the CEs and to maintain the learner-focused paradigm.

Reflection

Reflection is essential for TL and should therefore be a central aspect. Research participants consider it important to "integrate evaluation and self-reflection in each process" (PR-F), to "reflect on actions that are undertaken" (A-F) and to take schools out of their daily life routines to get a better overview and understanding of themselves. Part of reflection is questioning one's position, actions and perception of reality or a specific issue. An FGD participant stated, "when you [the students] leave my class, and you have more questions than you came in with, I did my job well, because you need to make them curious" (NL1-F). Another participant added that the same accounts for teachers who must be curious to learn with the students and explore new practices. The experts criticized that neither students nor teachers have sufficient time to "really reflect on what they are doing [... and] haven't gone through the process of really transforming themselves" (PR-F). By stimulating reflection and thus exploration, the users can naturally discover the systems that work at their school or in their personal environment in their own way. The experiment showed that closed-ended questions in student questionnaires do not lead to a major shift in the perception of self, the school, knowledge, or the environment. Whereas the ESCC indicator list, requiring a self-assessment on a scale based on available evidence, showed that users gain major insights and new perspectives on practices and their school. The practitioners urged to go deeper and identify the roots of problems that exist within the school and inhibit TL.

Reflectional processes must be initiated by asking the right questions. An assessment tool should, henceforth, ask the right questions and provide sufficient time for the process. The questions or indicators should be formulated so users must explore and reflect to complete the assessment. It should not be a to-do- or a checklist but a mindful, reflectional process. Strengths and weaknesses of the institution, community and/or the individuals can be identified, leading to increased awareness. "Change is hard to see when you're in amongst the mechanisms of change on a daily basis" (AUS-F). Therefore, the assessment should serve as an instrument to create an overview and greater awareness. Altered awareness is a foundation for TL experiences and continuous learning on every level.

Systemic understanding

A reoccurring analogy throughout the entire FGD was to *connect the dots*. Participants emphasized the cruciality to enable the learners to identify the important aspects related to the subject of discussion and connect them on their own. Understanding how everyone in the school community is connected in a meaningful way is important, "but it has to be also the dots connecting to your heart. And that means your mind and your heart really to become an organism" (A-F). Another participant underlined the importance "to think about how can we

work towards one conceptual understanding, one big idea, one big realization while allowing kids to do it in different ways" (NL2-F). She added, "when we begin to really think of concepts behind the conceptual understanding, we're trying to understand change, then we find the common language [...] when you begin to talk conceptually, then you're getting to work". Considering this, it is important to stimulate schools to work towards *one big realization* as part of the TL experience. Survey participants stated that it is difficult for them to gain an overview of their school's practices as they are "engaged in the weeds" (UAE-M). Conceptual understanding is indispensable when aiming for transformative learning on a school level.

The assessment should therefore provide the user with different perspectives, e.g., through asking critical questions, showing how different stakeholders and departments are interconnected. Furthermore, the assessment should challenge the school to connect diverse chunks of information, *the dots*, to create a new and clearer picture of the school and a new frame of reference. The users should be encouraged to collect new knowledge by including other stakeholders' perspectives which they investigate through discussion and exchange. Like that, they can see the school's practices from someone else's perspective, looking at the school through different lenses.

Meaningfulness and relevance – The why

Transformative learning describes an affective connection to learning and knowledge itself. The feeling of lessons being relevant in a larger context and the personal life is crucial. The data underlines the importance of that aspect. Participants urged to "make the assessment information personal: How will it affect me, others, the environment" (AUS-F) and encourage understanding – the why behind the phenomenon in the environment and the personal action. Values are the foundation for meaningful learning and create a network to explore complexity and connecting different disciplines to give learning a deeper meaning. "If you don't have the values integrated [it] is just a program and is not something that is embedded into the people" (A-F). Meaning can also be achieved through fostering a local approach (NL2-F). By connecting global issues to local symptoms, learners start to see their relevance within a larger system. FGD participants agreed that it is more effective to look at the school practices and implement changes locally instead of making indirect connections by pointing out what others are doing wrong elsewhere. This moves learning beyond the abstract or cognitive level and creates meaning. It shows that "learning can benefit [the] community and can really make a change" (PR-F). Additionally, it empowers the learners to take action as they discover their self-efficacy. "All school stakeholders would need to be included in understanding the assessment, why it's important and why new actions are required. The assessment could be the tool to internalise the findings and a way to empower the school stakeholders" (AUS-F).

The narrow majority of the students (57,14%) indicated that they completed an exam that they enjoyed. The assessments they enjoyed supported skill-building, were considered interesting or were related to the learner's personal story or identity. Meaningfulness and relevance underline the socio-emotional aspect of TL. The aspect of relevance connects to understanding *why* someone is doing something whereas the meaningful aspect goes deeper and connects to the individual and collective identity. To incorporate both, the assessment tool should be based on values. Through this, the individual and the collective can refer to the foundation of the assessment and develop a deeper understanding of its relevance by engaging with the values.

Interaction and dialogue

Interaction in this context describes the situation when individuals communicate with or react to each other. Dialogue, however, is seen as a serious exchange of opinion among individuals or groups who disagree. Through interaction and dialogue information is processed individually and collectively. The students showed to appreciate being asked to share their opinions and emotions. FGD participants proposed to involve students in the school's assessment, expecting it to have the additional benefit that "students [get] a glimpse into the world of school-wide planning" (UAE-M). Other participants suggested to "make it a lesson plan where the students interview their teacher[s] and other school stakeholders" (AUS-F).

On a school level dialogue and interaction mean that the community gains new insights into the personal experiences of its members. Ideas can emerge as the community explores the

diversity of opinions and perspectives. However, many teachers do not have the capacity or skills to effectively collaborate with colleagues who teach different subjects. Providing a tool with indicators assessing complexity and interdisciplinarity requires communication among different stakeholder groups. This contributes to move towards a more organic way of working together and help to connect different areas of the school during the assessment process. Practitioners state "there's always more room for learning when you work with a whole team of people" (NL2-F), "true transformation is done through both large-scale conversations (whole-school) and small scale (divisional, departmental, etc.) work." (UAE-M). FGD participants strongly emphasise that dialogue and interaction must exceed the tokenistic and superficial level to avoid "just trying to make a connection for connection's sake" (NL2-F). The connection must be grounded in meaning and underlying values. Otherwise, the effects will not have the power to shift the school dynamics and practices in the long term.

Students and teachers learn together within the framework of the school vision and policies. Translating cross-hierarchical relationships to the school level means that the principal and vice-principal need to be part of the initiative to ensure the wholeness and coherence of the experience. It is crucial to have school leaders committed to the cause in a deeper way than solely striving to obtain recognition. To effectively collaborate, language plays an important part. "In order to collaborate, let's stop saying me, mine, my children, my class, in my subject, in my course … as long as we think of this, we are never ever going to take responsibility for the entire school. Because it's the tendency to then say, that's not going to work for my subject in my class, my kids are not going to do this. But to really say ours, and we and to cultivate that." (NL2-F).

Stimulating interaction and dialogue during a whole-school assessment could be realised by bringing stakeholders together or requiring a task force or committee, consisting of parents, teachers, students, and staff. This way, relevant stakeholders are involved in the process and multiple perspectives and data sources are represented in the results. An assessment should be the kick-off event to show the emerging benefits of interconnection between school departments and stakeholders. It should emphasize and help to identify the needs of different stakeholders by encouraging a school-wide dialogue. The indicators of an assessment should include and refer to all the relevant groups of the school community and all aspects of school life to give a complete and realistic representation of the school. Aspects to include are, for example, curriculum, pedagogical practices, school infrastructure, community facilitation and events.

Mindset: Assessment as part of the learning journey

Following the TL paradigm, assessments cannot be perceived as the end of a learning journey that would prevent the long-term, gradual experience. Therefore, assessments must be a part of the learning journey, adding to its continuation instead of marking the end of it. The student-survey results confirm that this is not applicable from a learner perspective. 57,15% of the students stated that an exam marks the end of their learning journey. Another student stated that the journey continues and explained "after one exam, there is another exam. Then I have to learn more and more, and it doesn't end until summer" (UAE-16-F). It shows an understanding of continuity based on external pressure, but not on the perception of continuous learning and curiosity.

The need for stress-free assessments was raised by two participating students. A correlation between experiencing pressure and stress during assessments is assumed but cannot be confirmed by this research. It might be a contributing factor to the perception that assessments are not valuable experiences contributing to learning. Only two students stated to consider assessments part of their learning journey, "because I would like to apply that content to future content in the same class" (D-18-F). FGD participants added that according to their experience assessments disrupt the learning process and limit its possibilities. Assessment should be part of the school's learning journey, symbolising a checkpoint instead of a finish line. By identifying areas of improvement for the future learning path the assessment could be the first step of an overall paradigm shift. It presents an opportunity to "celebrate[s] what we have already embedded in our lifestyles, and at the same time help[s] us identify[ing] the parts that we need to work on and realise their value" (A-F). Participants of the experiment state to feel "a sense of pride" (AUS-F) after seeing what was achieved already, based on their results. This can be a motivational factor to keep improving and engage in continuous learning.

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Ownership

Ownership in this context expresses the act of an individual or group associating themselves with an action or output to which creation they contributed. Ownership is closely associated with meaningfulness and relevance or taking responsibility. "Learning is clearly reflected when the students have opportunities for choice and deep involvement, based on ownership of their work" (A-F). Translating this to the school collective, it is recommendable that the school provides a creative or relevant end product to internalise the knowledge that was gained throughout the process. More importantly, it creates ownership of the assessment experiences and their insights. Creating action plans and the school community working together leads to ownership of the end product. Teachers and students are more likely to implement planned changes when they are involved in the process. FGD participants agreed, "if you create it [an action plan] and then hand it over to the teachers there is no ownership at all … if we want you know, the social aspect to be … every voice is heard, then you have to develop the curriculum together, together with students together with teachers together with staff, but also, you know, the administration, administrative staff" (NL1-F). "[The school] experienced first-hand that art projects were very beneficial for knowledge and transformative learning experiences … This art project involved almost all school stakeholders in some way and the end result was very visual for all to see" (AUS-F). Another participant (UAE-M) suggested that a whole-school assessment could go hand in hand with larger strategic planning.

Collaboration between schools

The interaction among individuals of a school community is important for the TL process. Research participants translated this to the institutional level by suggesting to "have the students share their actions with students from different schools/communities/backgrounds/cultures as a collaborative effort to problem solve local and global issues relevant to them and their community." (AUS-F). Like individuals benefit from interactions with others, the same applied to schools going through a transformation process. A teacher-survey participant claimed that connections between schools could provide hope "by sharing stories … different schools that have successfully implemented the indicators" and "stories of people around the world striving and achieving change. The sense of not feeling alone in 'all of this'." (AUS-F). An assessment tool aiming to stimulate TL could offer opportunities for users to communicate and exchange. Community members can help each other to work through difficulties and benefit from others` experiences. By connecting the schools regionally, nationally, and globally, a learning community can be created supporting the institutional transition just like the school community supports its members, introducing a learning level (see ***Figure 3***). Teachers, often working on their limits, could support each other in the creation of interdisciplinary lessons. A community of schools following the same path encourages the institutions to continue, also in difficult moments.

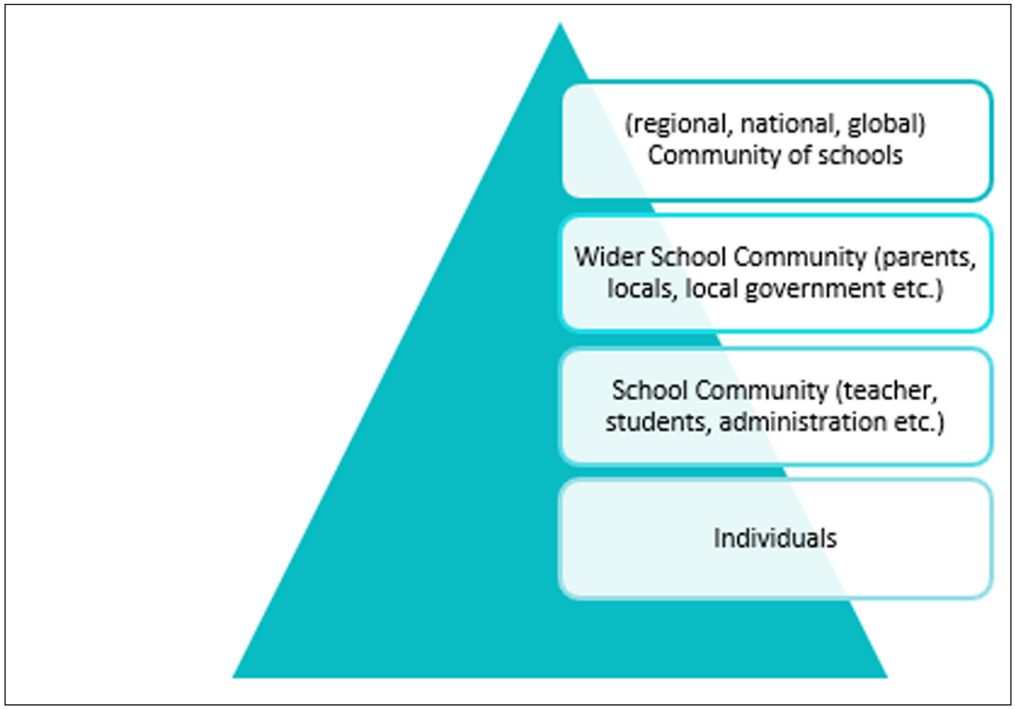

Figure 3 Expansion of learning levels.

Assessment design

The ECSS experiment showed that providing bar charts comparing the achieved score to the maximum score to be beneficial, enabling the user to gain a better understanding of the results. The visibility of the result and the progress appear to be important because it clarifies and shows the status quo in a different way than numerical assessment or worded results. Participants propose visualisation in form of an evaluation chart designed by teachers, parents, students, and other community members (A-F). Students suggest creative, practical, and continuous forms of assessments. Other reoccurring suggestions by students were: stress-free atmosphere, pop quizzes, visuals combined with text, working together with others, and using a variety of skills to demonstrate their understanding. Students showed preferences and ideas for visual engagement such as including pictures and photos into the tasks or "creating videos" and connecting assessments to personal and scientific interests. As students are a vital part of the school community, it is recommendable to design assessments with student input to increase their intrinsic motivation and feeling of ownership. An FGD participant warned that schools often take tokenistic actions. "We're going to teach to fit the assessment. And it needs to be the other way around … if it's not celebrating what's been taught, you can be as creative as you like in the assessment form if it doesn't celebrate creative thinking" (NL2-F). The "implementation would have to be very flexible" (AUS-F) to meet the school's individual needs and to offer the possibility to adapt to the local circumstances as suggested in the whole-school approach. Schools should be able to identify and celebrate their identity during the process. In a global context, a tool should encourage to explore whether there is room for more flexibility as every country has its curriculum and requirements.

Discussion

There is no research explicitly available on whole-school ESD assessment tools. Therefore, the findings are compared to the central aspects stated by other scholars in the context of TL and the whole-school approach. Reflection or critical self-reflection is a crucial aspect of transformative learning. Various articles investigating transformative learning processes on an individual and collective level stress its importance (Boström et al., 2018; Buechner et al., 2020; Hoggan, 2016; Romano, 2018). As no source presents reflection as counterproductive, one can conclude that reflection should be incorporated into the assessment. Meaningfulness evolves from other crucial practices such as reflection, systems thinking, local relevance and action. Similarly, the local approach is especially relevant in the whole-school context. Willink and Jacobs (2011) explicitly call for more meaningful and robust assessment approaches. Other scholars mention meaningfulness in various contexts e.g., meaningful social action (Boström et al., 2018; Hoggan, 2016), new ways of being (Buechner et al., 2020), and interaction (King, Magolda, & Massé, 2011). This shows that a meaningful approach to education and learning is largely accepted in the scientific community. Interaction between the learners and their environment is continuously considered essential in the context of transformative learning (Harmin, Barrett, & Hoessler, 2017; Illeris, 2014; Sterling, 2011). Other scholars confirm the central function of dialogue for TL and a prerequisite for engaging fully with the process (Hoggan, 2016; Romano, 2018; Westoby & Lyons, 2017; Willink & Jacobs, 2011). Lastly, Westoby and Lyons (2017) support the importance of collaboration between communities in a transformative learning process.

REQUIREMENTS FOR CONTINUOUS LEARNING ON SCHOOL LEVEL POST ASSESSMENT

After investigating how to stimulate TL on a school level the focus is now on the moment after the assessment, the post-assessment phase. To ensure continuous learning the post-assessment phase lays the foundation for the path forward. The following aspects present what could support schools with their first steps after the assessment and enable a fluid transition from learning to action, to ensure transformative and continuous learning after the assessment, and to encourage sustainable change.

Guidance

To make education meaningful, the schools need guidance. It is difficult to leave routines and patterns behind and to embrace new practices which require more effort at first. Here,

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the values become relevant again as they offer a foundation for any practice. Agreeing on certain values on the school level makes the planning of actions easier as they provide a framework based on which actions can be assessed. An integral value framework can be used to guide the first steps towards meaningful and transformative learning. To create a coherent learning experience for the entire school, the assessment results and the gained insights must build the foundation for the steps forward. A well-designed tool should offer guidance and inspiration to take action. Survey and the FGD participants recommended providing a guideline or framework to help the school find its direction after the assessment. Such a guideline could be based on the indicators that are used to assess the school, offering examples and templates for school policies, adjustments, exercises, or tools to identify the school's priorities and options. "Indicators could help us tailor our own 'evaluation chart' adapting it to our school culture, situation, and approaches." (A-F). Furthermore, participants suggested, "a template list of potential actions is necessary as some actions are not obvious to some stakeholders." (AUS-F).

Training for change – "Practice what you preach"

Resistance is usual during a transformative learning process, especially if old and habitual patterns are challenged. FGD participants declared that it is a choice to adapt the school's practices but that this choice is often not made. The post-assessment phase should be the moment to overcome that resistance to explore possibilities outside the comfort zone of the school. Resistance seems to come mainly from teachers who are already working at their limits. Survey responses and FGD stressed that teachers must be educated for the transition process to implement a whole-school approach and facilitate TL. "The teachers are the ones who have to really gain this understanding, first of all, and then we can move to the next step." (A-F). She also stressed that collaboration and combining subjects for interdisciplinarity is not more work "it's just a matter of how you pose the questions." (A-F). By changing the questions that are posed to the students, adaptions towards interdisciplinarity can easily be established without a significantly higher workload. "People want to do it, but they also need the skills to do it meaningfully." (NL2-F).

The bottom line for the post-assessment steps is coherence between values and action in what is taught to contribute to a stable learning environment. It needs to be lived on every level of the learning community, teachers and staff must be encouraged to "practice what you preach" (NL1F). Teachers are a role-model and shape the learning environment through their behaviour and practices. "If I'm not curious, then how will my students ever be curious?" (NL1-F). The participant, who teaches herself, stated that it is "important that [...] they understand why you're doing it, or we understand why we're doing it, and I feel ownership of it as a whole-school approach" (NL1-F). Understanding the *why* is associated with values, as they give deeper meaning to the changes and build a solid and continuous foundation for action. Providing teachers with the skills and knowledge to encourage TL and working according to the WSA are highly important to guarantee institutional learning and transformation. In line with the WSA, administrators and other staff need to be educated too so they may guide and nurture the kids together, enabling school-wide transformative learning.

Planning for change

The school should take steps to apply the lessons from the assessment to continue the learning journey. Next to a guideline, respondents suggested the assessment to "be part of a larger strategic assessment, visioning and planning process" (UAE-M). FGD and survey respondents suggested providing a final product in form of an action plan for improvement, a future-planning follow-up exercise, a "multi-year plan moving forward" (UAE-M) or a mission statement as a mandatory step post-assessment. An action for the period until the next assessment encourages continuous improvement and continuous learning. "If there's no ownership from different teachers if there's no ownership from leadership, then then it won't work." (NL1-F). Teachers and staff should be involved in the planning and development of the post-assessment actions to create ownership. FGD participants underlined the importance of ownership of the introduced changes by valuing and incorporating the teachers, students, and parents' ideas into the planning. This way, they will understand the importance and relevance

of what they do while ensuring that the needs of the different stakeholder groups are met. As actions require someone who executes the ideas a coordinator/facilitator, a committee (ideally consisting of students, teacher, parents, local businesses etc.) or a monitoring team should be appointed. This secures "institutional buy-in and explicit expectations on involvement by all stakeholders" (UAE-M).

Local and global partnerships

Collaboration within the school community, between like-minded schools, businesses and organisations can be vital to strengthen the whole-school communities and join forces for improvement. Experiment participants suggest "to have schools invite local community members or other schools to extend conversations related to the indicators to those spaces and communities" (UAE-M). Other participants recommended involving local businesses. "Businesses have a lot to offer towards the curriculum for real life learning" (AUS-F) and can be an effective way to join forces and create win-win situations for the local community. It can also help to avoid additional work. Through engaging outside parties and making them part of the school community a sense of accountability is created. Through openly committing to the goals and turning their achievement into a collaborative effort there is a higher chance of changes and actions being implemented. Parents and the local government should ideally be incorporated in that process to practice the WSA. Furthermore, participants repeatedly suggested encouraging collaboration between schools and "sharing ideas with other countries, that gives a different vision about a topic" (CR-F). Coaching and consulting, e.g., peer-counselling for "schools that might be interested but don't have internal capacity" (UAE-M) can help to facilitate collaboration and support among schools.

Rewards

Lastly, rewards and publicity and other forms of recognition, offered by the assessment provider, can be incentives for schools to act upon the improvement possibilities. A participant stated the "school took great pride in the rewards and positive publicity that they received [...] incentives and rewards to keep moving forward." (AUS-F).

Discussion

Even though there are no studies available on this specific topic the foundational aspects of this section align with the findings of other studies. For example, Bosevska & Kriewaldt (2020) confirm that schools need a guideline to implement a whole-school approach. A study on the whole-school, whole community, whole child (WSCC) model also emphasizes the need for guidance when implementing a new school model and additionally suggests preliminary actions and preparation reduce the challenges that complicate systematic planning processes (Hunt, Barrios, Telljohann, & Mazyck, 2015). Other studies, conducted in different educational contexts, address the importance of including teachers in developing new educational approaches and shaping the learning environment (Nordén, 2018). The natural resistance to change in the context of transformative learning as stated by Boström et al. (2018) is reflected in this study's findings while collaboration between communities going through a transformative process is a beneficial factor according to Westoby & Lyons (2017).

KEY ELEMENTS STIMULATING TRANSFORMATIVE LEARNING EXPERIENCES ON A SCHOOL LEVEL (K12) IN THE CONTEXT OF A WHOLE-SCHOOL ESD ASSESSMENT

The overall practice of transformative learning and the whole-school approach is not widely spread and are new concepts to many schools. Therefore, assessment tools could not only be used for accreditation purposes but also for introducing new ideas, learning paradigms and practices to the school communities. By combining the data from the previous section six key elements (KE) are formulated. They describe crucial aspects which stimulate transformative learning on a school level when included in a tool. Their effectiveness lies in applying them together due to their interconnection as visualised in ***Figure 4***.

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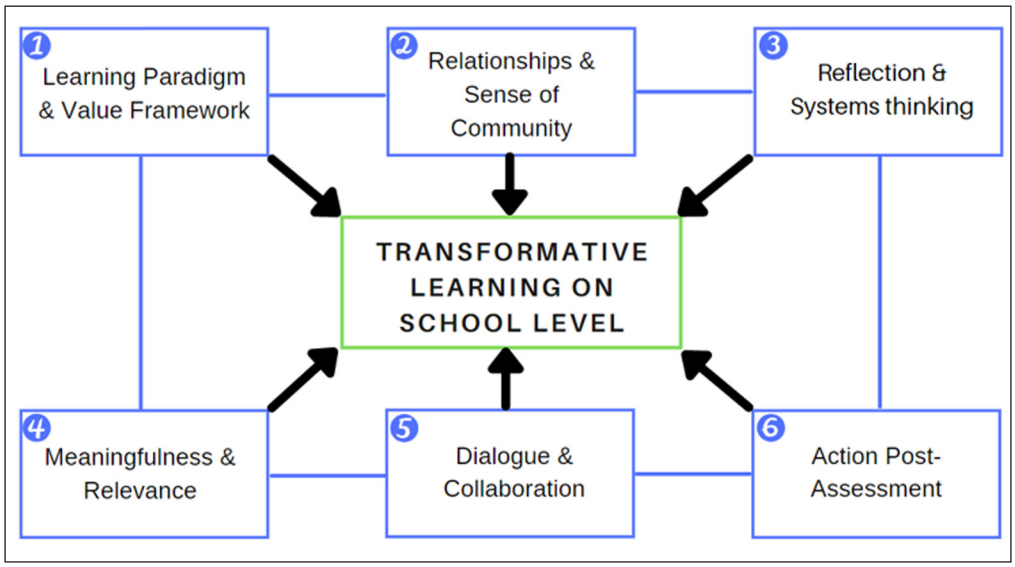

Figure 4 Interconnection of key elements.

1. Learning paradigm and value framework

Introducing the underlying learning paradigm of the tool as well as a framework of universal values can help to build a solid foundation for schools to start a continuous learning journey and can be initiated. While leaving space for individual adjustments the learning paradigm and the values frame the overall experience and can provide direction and security. This can be comforting when experiencing the cumbersome parts of the transformative learning journey, offering a foundation for decision making and other school practices. By encouraging the incorporation of fundamental values into the school ethos, policies, and curriculum the assessment can stimulate transformative learning on a school level by giving the individual and collective practices a deeper meaning while providing freedom to integrate them in various ways. Integrating values into the school's daily life begins to form a school identity. Values further provide a basis for reflection and a foundational understanding of the why behind actions. Practices must be grounded in values first before any other step can be made. Concluding from the FGD, the horizon of learning and assessments must get broader and move away from prescribing one single way to learn or assess. The shift towards more open and adaptive education paradigms could be considered as the first transformative necessary experience before the institutional change of practices and policies is possible.

2. Relationships and sense of community

Meaningful relationships are part of the social component of learning and contribute significantly to a good learning environment. They are an indispensable aspect for a healthy school community and therefore for learning on a school level. When considering the school as a system that consists of many smaller elements (the stakeholders) interpersonal relationships are what hold the elements together in the long term. Additionally, relationships provide a social learning opportunity and contribute to meaningful experiences in the school. They make the school and its community more than just the sum of its parts and deepen the learning process (see also KE 4).

3. REFLECTION AND SYSTEMS THINKING

Reflection stimulated by systems thinking is essential for transformative learning and should be incorporated into tools aiming for learning at the school level. A tool can stimulate reflection through the composition of its indicators or questions and can offer new insights leading to deeper understanding. By carving out the schools' strengths and weaknesses, the assessment process can be a reflectional practice for the entire school. Systems thinking and creating a conceptual understanding of the school, e.g., through systems mapping, *the dots* are connected on an individual and institutional level, contributing to the adaption of perceptions and frames of reference and institutional reflection. In the context of ESD, it is further important to "facilitat[e] the understanding of facts regarding our planet systems, processes, and cycles, under the sustainability lenses, by analysing and evaluating alternatives and placing them into context and learning to take action by actively getting involved in projects that relate to current

global issues." (A-F). Through posing the right questions curiosity is stimulated to continue the process. Additionally, the tool can paint a mindful picture of the continuous learning journey: to show where the school comes from, how it got there and what the possibilities of the future are.

4. Meaningfulness and relevance

Meaningfulness and relevance, understanding the *why*, are essential to engage learners. Creating a meaningful learning experience for all the individuals and the community can be achieved by giving "recognition that school learning impacts the world. A focus on skills and dispositions that support a better world." (UAE-M). Connecting school practices to local problems and needs gives the school's actions meaning. Showing the school and the individuals that their actions can make a real impact can have an encouraging effect to continue and work even through cumbersome experiences. In combination with underlying values, this can create purpose, functioning as a motivational factor for the school. The assessment should likewise show that there are possibilities for growth for everyone in the school community and create space to act upon the personal interests of individuals and groups and exceed tokenistic action.

5. Dialogue and collaboration

Throughout the assessment, the aim should be to encourage effective communication, dialogue, and collaboration to incorporate the social and interactional aspects of transformative learning. The assessment process itself should encourage collaboration and dialogue across the school and all stakeholder groups. The indicators can be incentives to show the possibility for connections between school departments and activities. Dialogue and collaboration between school communities' post-assessment can have a vital impact on the continuation of the school learning journey. The schools learn from one another through sharing experiences, problems and supporting each other. This creates a feeling of not being alone in the process and can have positive effects on the schools' development. The perception of learning from and with one another is crucial for this to succeed. The FGD showed that exchange and collaboration between practitioners can be a motivating and empowering experience to continue a process of change. The statements of the survey and FGD participants showed the importance of the community and the relational aspect of learning. Motivation to continue arises with the opportunity to share thoughts and problems with a group, to feel understood and not alone. Especially individuals that take the responsibility for driving change and aim to convince the remaining school community to join the process experience frustration. They explicitly state that exchanging with others in a similar situation encourages them to continue.

6. Action post-assessment

Applying the newly obtained knowledge and translating it into action is the last crucial element a whole-school ESD assessment should promote when aiming to stimulate transformative learning experiences on a school level. This aligns with the experience-based approach to learning of the transformative learning theory and the whole-school approach. The actions should be planned and executed with the involvement of the entire school community to create ownership and give the actions meaning. Acting can have many different forms (e.g., celebrating successes or creating an action plan for improvements) but should align with the school's insights, goals, and vision. To stimulate transformation on the whole-school level there should be events and initiatives for the school community. Here, the benefit of including parents and local businesses should be remembered and harnessed.

CONCLUSION

This exploratory study aimed to provide insights on what future whole-school ESD assessment tools should incorporate to contribute to a sustainable shift towards learner-friendly and meaningful education. It should be considered as the first step of a long path to explore the possibilities and implementation of assessment tools within a new education paradigm that values diversity and sustainability. Even though this research included practitioners, experts from the field and students the six key elements must be tested empirically to determine their accuracy in a large-scale, real-life context. The author, therefore, recommends empirical long-

term studies with a global sample to investigate the effectiveness of the six key elements. Different tools, incorporating the KEs, need to be developed, tested, and adapted to determine their usefulness in practice. Direct and in-depth conversations with students, teachers and school staff are highly recommended as this enables the researcher to understand the study population better and collect in-depth knowledge. To determine how effective the abovementioned propositions are different tools need to be developed, tested, and adapted to determine their usefulness in practice and gain new insights.

LIMITATIONS

This exploratory study was small-scale and in-depth to gain first insights into the largely unexplored field of ESD whole-school assessment tools. The research results are merely impulses in which direction future research should go and an evaluation of the current situation in the field with ideas for the next steps. Therefore, the research result cannot be directly translated to a large, international sample.

ETHICS AND CONSENT

All statements and personal data were anonymised so it cannot be traced back to the individuals in order to protect their privacy. The frequently quoted participants of the FGD signed a consent form that the information of the discussion may be published under the condition that it cannot be traced back to their identity.

ADDITIONAL FILE

The additional file for this article can be found as follows:

- **Appendices.** Appendix A–H. DOI: *https://doi.org/10.5334/glo.48.s1*

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COMPETING INTERESTS

The author has no competing interests to declare.

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