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ORIGINAL ARTICLE

Enabling shared values for sustainability transformation: empirical lessons from a case of promoting cross-group collaboration in China

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Abstract

Finding pathways to enable values-for-sustainability transformation is crucial. Despite the emergence of strategic insights and theoretical frameworks like the Four Perspectives, there remains a scarcity of empirical work to directly engage with values for pragmatic learning. We address this gap by presenting an empirical case study of an intervention designed to move two groups from non-collaborative to collaborative on the basis of newly found shared values. By conceptualizing values as tacit knowledge and employing the Knowledge Creation Theory, our intervention facilitated the development of cross-group shared values through *Externalization* and *Combination* modes. Our results demonstrate empirical evidence of values-engagement processes including Surfacing and Negotiation from Four Perspectives (i.e. Surfacing values, Negotiating values, Eliciting values, Transforming through values), and informs their sequence of appearance. We highlight the importance of a pool of shared experiences as basis for Surfacing, and demonstrate the utility of the SECI (*Socialization, Externalization, Combination, Internalization*) model to plan the utilization and sequencing of values-engagement processes towards achieving sustainability transformations. The findings suggest that starting with participants having shared experiences facilitates Surfacing and Negotiation of values, and enables developments of cross-group collaboration valuable for providing preparedness for a diversity of sustainability transformation contexts.

Keywords Shared values · Sustainability transformation · SECI model · Transdisciplinarity · Empirical study · China

Introduction

Sustainability is a normative concept that suffers from lack of agreement regarding what is worthwhile and meaningful (Horcea-Milcu et al. 2019), yet it is a term that continues to have enormous traction in science, society, governance, business, and industry. Given the state of our planet, a transformation towards a more sustainable world appears to be urgently needed even though what sustainable exactly means is still a work in progress (Díaz et al. 2019; WMO 2018).

In investigating and seeking such transformation, which is inherently values-laden, it is increasingly recognized that engagement with values-related issues is unavoidable (Funtowicz and Ravetz 2001), and there is an important role for values in sustainability science (Abson et al. 2017; Fischer et al. 2012; Ives and Kendal 2014). Our goal here is to study values engagement processes empirically in a case study to respond to the research need to provide a wide (less constrained) range of insights, capable of informing the ongoing theory building.

Values need to be explicitly addressed in transformation science (Tschakert et al. 2016), which means that more studies of values and values engagement should be carried out where they are the research object in sustainability research, both empirically and theoretically (Schneider et al. 2019). Recent strides in theories about ecosystem services and biodiversity have demonstrated the fundamental importance of such deep consideration of values engagement (Pascual et al. 2023). Currently, there are scant empirical studies which

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focus on values engagement, and those which do, mostly collect and analyse data to demonstrate specific frameworks (e.g. Berghöfer et al. 2022; Gray and Manuel-Navarrete 2021; Priebe et al. 2022). There are thus emphasized calls for further empirical studies (see e.g. Horcea-Milcu et al. 2019). It is also clear that values are relevant in several dimensions of sustainability transformation. Anneline and Boström's (2022) recent review on sustainability competencies identified 'values thinking' as a key sustainability competency (Komasinski and Ishimura 2017; Remington-Doucette et al. 2013), and also as a major driver for transformations. Recent research also shows a growing distinction between focus on 'what values are essential' (e.g. Martin et al. 2016; Fischer et al. 2017) and 'how values can be utilized' (e.g. Ives et al. 2019; Bentz et al. 2022). In this paper, we focus on the latter research need: to empirically explore the processes through which values can be engaged towards sustainability transformation, i.e. values engagement processes.

Values studies span a diverse range of theoretical conceptualizations [see e.g. review by Rawluk et al. (2019)], and only recently the complexity arising from their ontological and epistemological richness and plurality has been embraced, distilled and presented for navigation specifically in relation to transformation-oriented sustainability science, in the Four Perspectives approach (Horcea-Milcu et al. 2019). Instead of using typologies or categories, these Four Perspectives include 'Surfacing' implicit values (S = Perspective 1), 'Negotiating' values (N = Perspective 2), 'Eliciting' of values which dominate in the context of specific problems (E = Perspective 3), and any kind of Transforming which take place through values engagement (T = Perspective 4). There is currently no given sequence or linkage pattern given between them, but, as shown schematically in Fig. 1, the Transformations (T) occur on pathways that are always expected to be moving towards sustainable transformation and involving any of S, N and E. There has been an explicit call for more work on how the Four Perspectives shape, constrain and interact with each other (Horcea-Milcu et al. 2019). For the Four Perspectives approach and other values approaches, there are calls specifically for empirical studies to assist better theory building, and to accelerate strategic prescriptions of applications which could be useful for targeted sustainability problems. For this reason, we have chosen to design a study which is empirical. To ensure it has greater/wider value towards theory building, we have prevented it from being unduly constrained in at least these two dimensions: that no sustainability transformation context will be defined; and that Transformation pathways (T) will not be constrained only to group or individual levels. We explain this further, immediately below, but in brief this means we choose to study values engagement processes in S, N and T but not E, using an intervention with several naturally formed groups (of teachers in a school), with the target transformation being for two different group types to significantly increase their common shared values and collaborate better.

Firstly, the reason our study will not constrain itself to any specific sustainability transformation contextual problem,

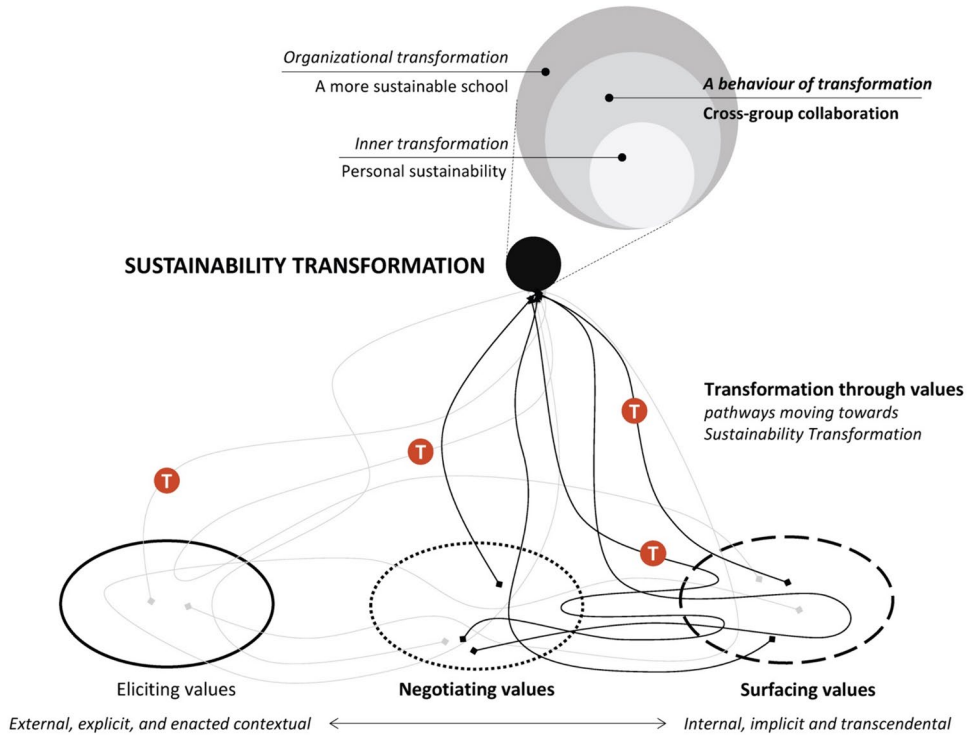

Fig. 1 A schematic illustration of the Four Perspectives of values engagement processes (surfacing, negotiating, eliciting and transformation) towards sustainability transformation (with three nested levels) indicating several possible linkages. Those in bold were the focus designed in this study

such as climate change or deforestation, is illustrated in Fig. 1 which depicts Perspective 3 (E), as a process where the 'contextualized' values of people are revealed after they have been shaped while considering a specific topic. Their 'judgments' or 'opinions' on that topic are the 'Elicited' values. Such studies would be context specific and not very generalizable. They would neglect a focus on the initially held transcendental values that first shape an individual's original position (Kenter et al. 2016a, b), shown in Fig. 1 as 'Surfaced' and then 'Negotiated'. Some researchers have emphasized the importance of this transcendental aspect, even suggesting that "tools for surfacing transcendental values in the incipient phases of participatory processes" should be developed (Horcea-Milcu et al. 2019). This need for better understanding of the role of transcendental values with respect to contextual values has also been indicated in studies of deliberation processes (Kenter et al. 2016a, b). The expectation is that if they are understood better and we can learn to directly follow their influences and responses during sustainability transitions, then in future we will be able to directly plan for transforming through values, for more effective transitions. Therefore, our study will focus on Surfacing (from transcendental), and Negotiating, but not Eliciting (problem-contextualized).

Secondly, in our setting, the sustainability problem context might be to achieve the sustainability transformation of a 'more sustainable school', but in our study the target transformation is more fundamental: it is to get groups which do not work well together to develop significantly more shared values. From that foundation, they could in principle achieve many different types of sustainability transformation. Therefore, we will focus on values-engagement processes to achieve this particular transformation. The reason we consider this to be a 'behaviour of transformation' is that regardless of any problem context (e.g. climate change adaptation, green supply chain transition, natural resource conservation), collaboration is a form of activity that will have to be embedded all the way through, as sustainability transformation is a process of social construction which requires collective decisions and actions (Thoresen 2017). It was also well established in education for sustainable development that one of the four pillars is 'learning to live together', meaning "developing an understanding of other people and an appreciation of interdependence—carrying out joint projects and learning to manage conflicts—in a spirit of respect for the values of pluralism, mutual understanding and peace" (Delors 1996, p. 97). Hence, we adopt the view of this type of collaboration is essential for fostering sustainability transformation.

Consequently, we have chosen to study a school, and groups of staff within it, because this setting represents a microcosm for the wider contributions we could potentially make to the field of sustainability transformation. It includes space for transformations on three levels: the 'inner transformation' [or personal sphere of sustainability transformation (O'Brien 2018)] of the people involved; a specific 'behaviour of transformation' [or practical sphere of sustainability transformation (O'Brien 2018)], i.e. cross-group collaboration; and, (although not the focus of the study); an 'organizational transformation' [or political sphere of sustainability transformation (O'Brien 2018)] towards the sustainability transformation goal of being a 'more sustainable school'. In such a school the pervasive ethos would relate to sustainability in terms of how decisions are made, how diversity is viewed, how conflict is handled, etc. (Wals and Mathie 2022; Henderson and Tilbury 2004). This work shares some similarities with work dedicated to creating transformative space for sustainability transformation projects (e.g. Charli-Joseph et al. 2018). "Transformative spaces allow and enable dialogue, reflection, and reflexive learning, while reframing issues in ways that allow solutions to be co-created and co-realized" (Pereira et al. 2018). Divergent values and interests are explored through learning and reflexivity during these processes (Ely and Marin 2016). Given the essential role of values as being the fundamental factor of change (e.g. Stern et al. 1999) and as recognized for sustainability transformation (Horcea-Milcu 2022), we view this study design creates a space for transformation that is values based.

In sum, we here investigate values engagement processes in a case study to gain empirically based insights for building theory related to values in sustainable transitions, such as the Four Perspectives approach.

We do this by carrying out a case study where we designed and implemented an intervention for developing shared values across two group types of staff who initially had separate and substantially different sets of shared values. The target transformation was from non-collaboration to collaboration. The intervention design included several steps informed by the Knowledge Creation Theory (Nonaka 1994), and the investigation was informed by the Four Perspective heuristic framework (Horcea-Milcu et al. 2019) which allows values processes to be viewed in a grounded manner.

Specifically, we aim to answer the following research questions:

1. What is the nature of, and linkages between, values engagement processes revealed empirically when examined using the Four Perspectives (in the context of an intervention designed to move two different group types towards deep collaboration)?
2. What general insights can be gained from the empirical data for better planning of future sustainability transformations, both theoretical and practical?

This paper is organized as follows: the next section discusses the theoretical foundation which informed the research design. The methods section presents the case setting, intervention design and implementation, data collection and analysis methods. The results are presented thereafter, followed by discussions on implications of our findings and conclusions with recommendations for future research.

Theoretical foundation

Below, we first present our conceptualization of values which informs the investigation in this study, particularly emphasizing their nature of being transcendental and being shared. We then briefly introduce our conceptualization of transcendental values as a type of knowledge (tacit knowledge), and our application of the knowledge conversion model from Knowledge Creation Theory (Nonaka 1994) to design an intervention to achieve the target transformation T of deeper collaboration across two group types (and specifically, to draw individual values up to a collective level, and then to provide a space where they can become shared).

Transcendental values within an individual boundary

The particular lens employed in Horcea-Milcu et al. (2019) views values as transcendental contextual values (Kenter et al. 2015; Raymond and Kenter 2016). Transcendental values are seen as 'held' values: first-order preferences that transcend specific situations, and guide selection or evaluation of behaviour and events. Since there are diverse conceptualizations and typologies of values, we declare that we broadly follow Rawluk et al. (2019), in that we understand transcendental values as cross-situational and action based. Hence, we substantively work with embodied transcendental values that are already justified through and embedded in people's subjective experience, in this paper. This influenced our choice of a case study involving naturally formed groups in a common workplace.

Analytically, we approach the development of shared transcendental values by a group of people in this study as an act of meaning-making, following other authors in transformation studies (Hochachka 2022; Priebe et al. 2022). As we describe in the next section, we employ the WeValue InSitu process of shared-values crystallization as a method (Odii et al. 2021). Despite the relative stability of transcendental values [e.g. according to Schwartz (1992) and Schwartz et al. (2012)], the accessibility of a person's values is known to vary in different cultural situations (Stolte and Fender 2007). This means people may access and apply particular values depending on the situation they are in. Therefore, we assume in our work that a boundary is needed to create a situation for people to make meaning within, such as, 'English-speaking teachers in this school'. Consequently, the values considered in this study may be closer to cultural values (Stephenson 2008), or lived values (Graham et al. 2013), or possibly as 'contextual' as in the work of Rawluk et al. (2019).

In the sustainability science field currently, the term 'context' commonly refers to a specific sustainability problem (Schneider et al. 2022) such as deforestation, or climate change. But for 'cultural context', terms such as 'border' and 'boundary' are used (Norton et al. 2022). Here, we define and set up the 'boundary' to be the shared experience of those involved. That is, values engaged in this study are related to people's historical experiences which influenced a diversity of evaluations, behaviours and events (Schwartz 1992) commonly known to them all within an established meaning-making boundary (e.g. 'English-speaking teachers in this school') but transcendental with respect to problems (e.g. how shall we prepare for climate change, or, how shall we become a more sustainable school).

This choice implies that we do not focus on contextual values or assigned values which are not inner values but are already modified as relating to the contextual problem and thus representing "beliefs about the importance or worth of (specified) people, places or objects" (Kenter et al. 2016a, b), as per Perspective 3: Eliciting. Rather, our interests are related to Surfacing implicit values (Perspective 1) and Negotiating across values (Perspective 2) within a given boundary. Throughout all our investigations, we retain our interest on pathways of Transforming through values (Perspective 4).

Shared values with a normative intention

Underlying our emphasis on shared values in this paper is the idea of commonality and togetherness (Horcea-Milcu et al. 2022). Our definition of 'shared values' aligns partly with the conceptualization that "shared values may refer to values held in common by groups in particular contexts" (Kenter et al. 2015), while delimiting the 'contexts' to be 'boundaries' marked by shared experience, in which shared transcendental values are manifested. With the normative intention, one that also underpins notions of sustainability, we define, in this study, the shared values to be those values within shared boundaries that different stakeholders can hold together before coming to a specific context for a joint solution. This is very different from deliberation, where the negotiation object is usually not values but the opinions they spawn regarding a specific contextual problem (and thus more related to Elicitation in Perspective 3) and which does not necessarily need "unanimous consensus, but rather plastic ways to deal with value conflicts while maintaining the naturally occurring plurality of expressed differences."

While a distinction can be made between individual and shared values we do consider them as inevitably related as (a) the negotiation of values is a social process in which diverse individual values are involved and shared values are generated and promote transformation through different mechanisms (e.g. Horcea-Milcu et al. 2018); (b) global transformation also requires individual transformation (O'Brien 2018), which can be achieved through focusing on values shifts in the deep inner dimension (Fazey et al. 2018a, b), such as changes in self-awareness of a person's embedded values (Parodi and Tamm 2018). Our use of the term 'boundary' denotes this distinction, in that individual values are held within individual boundaries whereas shared values are held within a shared-experience boundary. Moreover, we align with the ideal of Phase 0 (Horcea-Milcu et al. 2022) in which togetherness with shared values is seen as useful in nurturing transdisciplinarity.

In sum, it is our intention to bring together groups with different values and to facilitate them to establish shared transcendental values (through Perspective 1 and Perspective 2), before going into a decision-making process concerning any specific sustainability context/problem. We view these shared values as transcendental values common to members of a group which are manifested in their common actions, and we provide a boundary allowing them to be surfaced and identified. For the rest of this paper, we use 'shared values' to refer to shared transcendental values for conciseness.

Transcendental values as tacit knowledge and the SECI model

To ensure our intervention design is capable of producing the shift of ontological entity that holds the values, we draw on the organizational Knowledge Creation Theory (KCT) (Nonaka 1994) which provides a pathway to carry knowledge from the individual level to the collective level (group or organizational). In this study, we conceptualize embodied transcendental values as tacit knowledge and project the process of developing shared values as a knowledge creation process. This naturally leads us to the use of the KCT pathway, named SECI (Nonaka 1994), in our design.

Tacit knowledge usually refers to knowledge that is difficult to be articulated and thus hard to be communicated and transferred among individuals, thus usually gained through living experience (Polanyi 1962). Polanyi asserted that all human knowledge was inherently tacit since it is held in person, but it can have different levels of explicit articulation: thus a continuum from more-tacit to more-explicit knowledges. Values shape our actions and are embedded in objects, inherent in individuals, and synonymous with their behaviour (Adler 1956). We maintain that these characteristics are mainly tacit, in that values inform experiences and are embedded in personal experiences. People who have regular, self-chosen experiences—horse riding; computer programming; orchestra playing—are manifesting embodied transcendental values.

The Knowledge Creation Theory which we use defines knowledge to be 'justified true belief' (Nonaka 1994), from which we can deduce that if we are studying values affiliated with common experiences of a group of people, then the values discussed can be bounded by those experiences, and represent (justified) 'values-in-action' which is indeed knowledge by this definition. Although it was never explicitly discussed in the Knowledge Creation Theory, the close relationship between values and tacit knowledge was implied in places. For instance, Nonaka et al. (2006) asserted that "due to 'embodied necessity', two individuals will never share exactly the same values, beliefs, observations and viewpoints" which implied that parts of the values are tacit. Moreover, in footnote 3 of Nonaka et al. (2006), it was explicitly stated that values are considered as a 'subjectivity issue' to be incorporated in the holistic framework of the theory and "in the framework, knowledge inherently includes human values and ideals". Even beyond this field, in research of mindful practice, it is more explicitly stated that "tacit knowledge … includes prior experiences, theories-in-action, and deeply held values, and is usually applied more inductively" (Epstein 1999). Therefore, we consider our conceptualization reasonable to incorporate in our intervention.

The essence of organizational Knowledge Creation Theory developed by Nonaka (1994) is the dynamic and continuous evolution and interaction between tacit and explicit knowledge in a form of an expansive spiral through which new knowledge could continuously be created, diffused and embedded. This process is illustrated in the so-called SECI model consisting of four key modes, *Socialization*, *Externalization*, *Combination*, and *Internalization*. The first, *Socialization*, is the process through which individuals transfer, obtain and convert tacit knowledge from each other by sharing experiences via observation and imitation (Nonaka et al. 2000). *Externalization* is the process of translation from tacit knowledge to explicit knowledge on the individual level, through which tacit knowledge is articulated into codified form to allow people to share more easily. It usually happens on a group level, either formally formed or self-organizing. *Combination* is the process in which articulated explicit knowledge from different resources is brought together into one context and systemically synthesized on the organizational level, e.g. through meetings or computerized conversations. *Internalization* is the process in which systemic explicit knowledge is embodied by the individual into their own personal tacit knowledge through 'learning by doing'. Individual tacit knowledge is accumulated through *Internalization* where it becomes a routine knowledge asset.

Methods

Case setting

To explore empirically the processes of values engagement towards sustainability transformation, we carried out a single case study in an international elementary school. The criterion for selection was an organization which had a problem that could be conceptualized as one of the overarching and fundamental sustainability transformation barriers. In this case, the school had identified a serious lack of cross-group collaboration, which was a barrier to work together towards a meaningful transformation, e.g. in the way their organization runs (e.g. Burritt et al. 2020; Catarci 2021; Garrido et al. 2020). We identified this as a barrier for people holding different values (which are manifested in different perceptions, different decisions and different actions), which we could intervene on, and thus the case was considered suitable.

The school was situated in Shanghai, China, and comprised of domestic and international teachers. They were generally either native Chinese bilingual speakers, or foreign English-only speakers, each with anywhere from little to huge experience outside their native countries. The school size was small (27 teachers and around 240 students), with a simple and very flat management structure. Only four teachers (two each from two group types) held administrative management positions, concurrently fulfilling their customary pedagogical duties. The research was carried out between October 2020 and November 2021, with post-interviews continuing until January 2022.

Intervention design and implementation

To study the nature of, and linkages between, values engagement processes revealed empirically, we designed an intervention consisting of values-based methods which were used in an SECI cycle (Nonaka 1994), namely, a process of knowledge creation from the individual level to the collective level (as depicted schematically in Fig. 2). Such a process can provide a pathway for members of different values groups to create new, shared knowledge collectively, which we used as a 'behavioural intervention' for moving them to more-common shared experience-related values, and a possible transformation towards sustainability transition. Specifically, we chose this Case setting of a school which had two different types of teacher groups, self-defined in that they clustered into two different rooms during breaks, and did not collaborate much across groups. We developed the behavioural intervention using different methods for each step in the SECI cycle (Nonaka 1994).

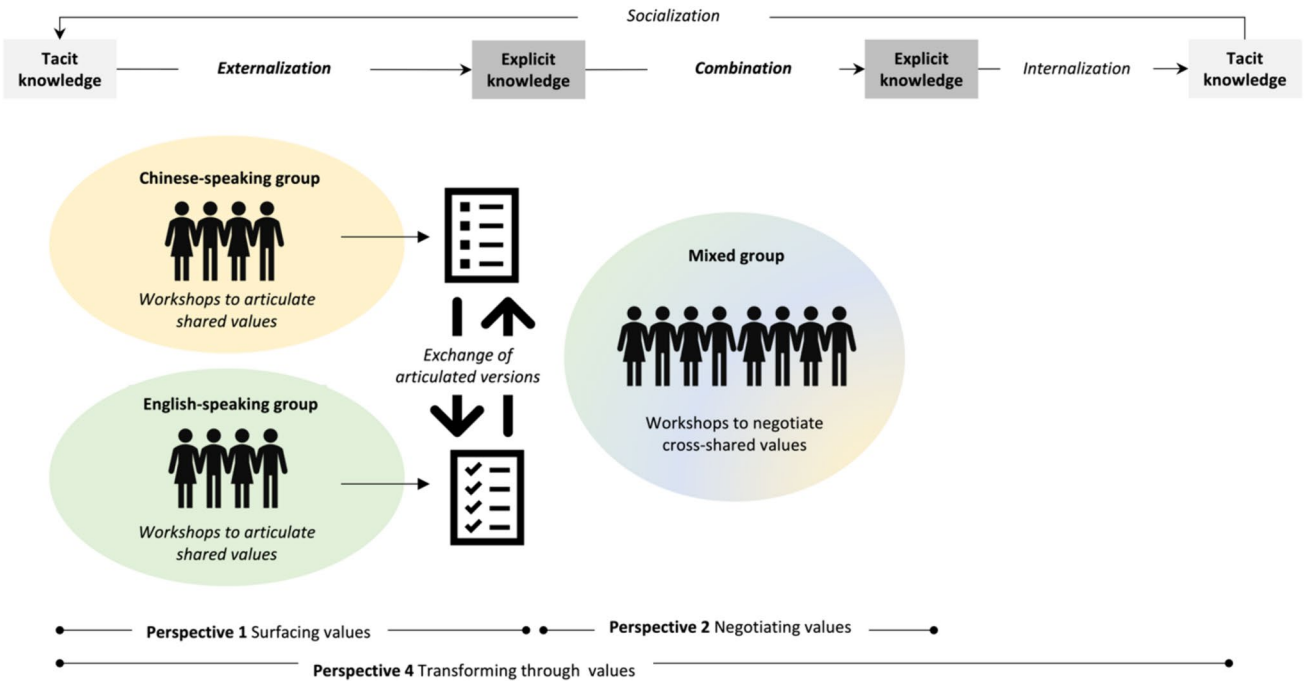

Fig. 2 Schematic illustration of how Perspective 1, Perspective 2 and Perspective 4 are realized through our intervention design based on the SECI model. Two types of groups first articulate their shared values, then exchange articulated versions of them, with illustrative examples, then met in mixed groups to negotiate their cross-shared values, enabling subsequent transformations to occur

Socialization

The Socialization phase of SECI (Nonaka 1994) (in two separate group types) was deemed to have taken place before we arrived. Data was collected to capture the historical shared experience of the participants, an overview of the management structure, and perceptions of the management group on what collaboration challenges existed and what good collaboration would look like. We obtained a baseline understanding of the *Socialization* status of the school for future reference, by conducting face-to-face key informant interviews (Patton 2002) with four key management teachers of the school (EC.1 in Table 1), who had both rich experiences of interacting with different teachers and overarching understandings of how the internal dynamic was, to gain a preliminary understanding of issues they encountered when moving towards more cohesion and collaboration among teachers in a long-term attempt to create a more sustainable school. Key informants are those with particular knowledge about the inquiry setting and whose insights are particularly valuable for those who seek to understand a field without pre-experience (Patton 2002).

Externalization

For the Externalization phase of SECI (Nonaka 1994), we employed the WeValue InSitu process which is well proven to facilitate the articulation of group-level shared values into an explicit form, through intersubjective processes (Burford et al. 2016, 2013; Harder et al. 2020). Previous studies show that it facilitates a highly interactive space, with meaningful dialogue and several types of collective learning (Harder and Burford 2019). The process is conducted in a workshop form, with well-defined practice-based stages including contextualization of the group, photo elicitation, individual triggering, collective negotiating discussions and shared values framework construction (Brigstocke et al. 2017; Moreno et al. 2017). Each workshop typically takes 2–3 h for a group of 5–10 people. The participants settle on their own boundary for discussion defined by their shared experience (such as, "We are all teachers in this school, coming from Western countries"), and are facilitated to explore, discuss and negotiate (e.g. "What is important to us, within this boundary"). A list of values-based trigger statements is used to loosely prompt the discussion in which participants share and discuss examples of their values illustrated by their experiences. In this way, they negotiate which aspects are 'most important' to them, and iteratively develop well-articulated statements of their priority shared values. They then arrange them in their own bespoke framework (as illustrated in Fig. 3 in "Results"). During this process, shared meanings are generated as the target, but individual learning and meaning-making also occur due to the intersubjective challenges and negotiations (Odii et al 2024). Transformations have been routinely documented (Harder et al. 2020; Sethamo et al. 2020), suggested as being linked to deepened self-awareness.

We conducted the first round of workshops (EI.1 in Table 1) with two groups of English-speaking participants and three groups of Chinese-speaking participants. A total of five WeValue InSitu workshops, each lasting 3–4 h, were facilitated face to face in the natural language of the participants to ensure the quality of communication and minimize the differences caused by external factors. However, they used the same written materials in English (despite Chinese Mandarin being available), as the participants stated this preference, and they had no problem reading and understanding the materials, while they preferred to express

Table 1 Details of the intervention design and implementation

Mode involved	Research implementation steps		Number of units
Externalization	EC.1	Pre-one-on-one interview	4
	EI.1	WeValue InSitu Workshop: shared values intersubjective articulation within same type groups	5
	EC.2	Post-one-on-one interview 1	17
	EC.3	Post-one-on-one interview 2	14
Combination	CI.1.1	Focus group discussions on frameworks: Articulated information sharing within groups	2
	CI.1.2	Framework information diffusion and reading	N/A
	CI.2.1	Focus group discussion on frameworks: articulated information elaboration within selected mixed groups	2
	CI.2.2	Insight booklet diffusion and reading	N/A
	CI.3	WeValue InSitu workshop: shared values intersubjective negotiation within merged mixed language groups	2
	CC3.1	Post-one-on-one interview 3	24
	CC3.2	Post-one-on-one interview 4	12

C data collection, *I* research intervention

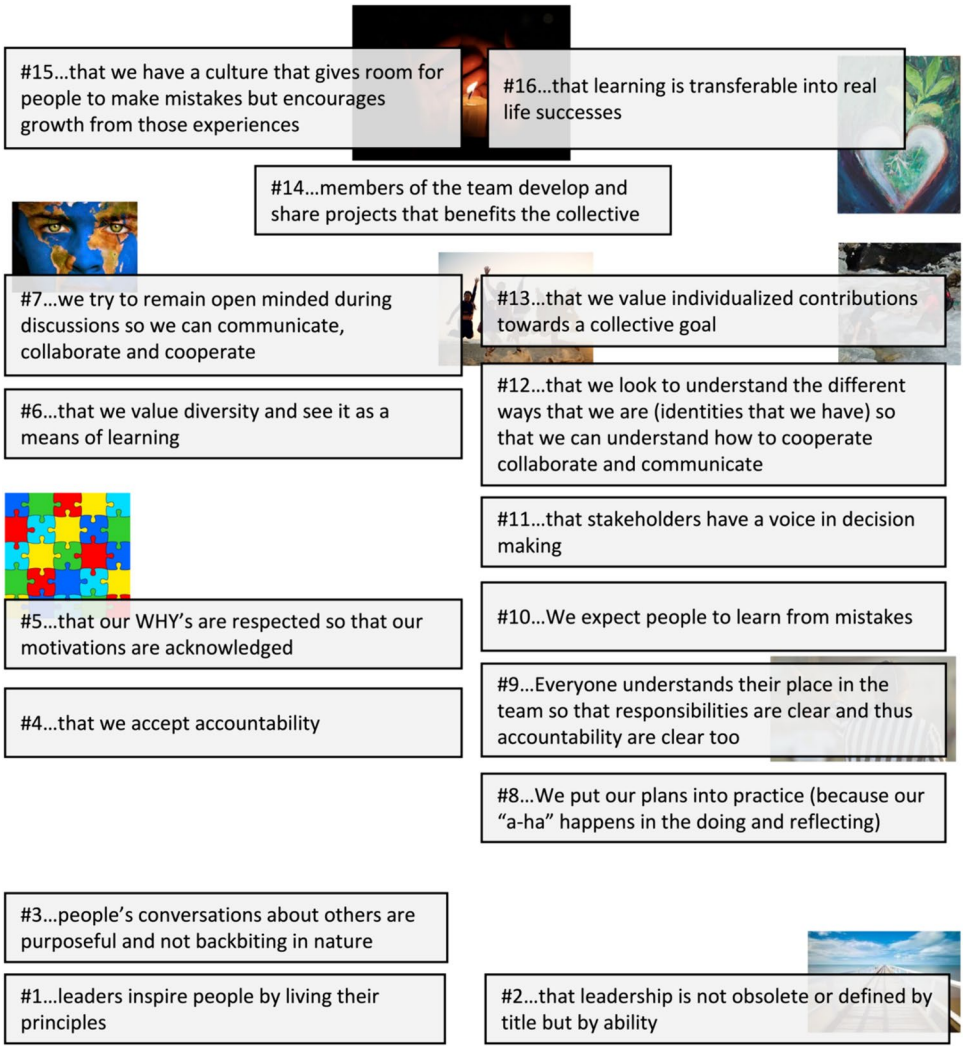

Fig. 3 A shared values framework constructed by one of the WeValue InSitu workshop groups from EI.1. All shared values statements shown in grey boxes begin with "it is important to us that…". Photos were chosen by participants in the Photo Elicitation stage, removed from sight and then allocated a position in the final after it was constructed, as a test to see if the concepts had been included

themselves verbally and hold discussions in their native language. The boundary in this mode was set to be "what is important to us as a teacher in this school" with the emphasis on pre-existing reality.

Combination

For the Combination phase of SECI (Nonaka 1994), the articulated statements from (E) above were presented, shared and explained across groups in various ways. The two group types were then mixed together in their second WeValue session, where they negotiated meaning of the values that they shared as a new group, with a wider vision. They articulated these into concise bespoke statements in their own framework.

Firstly, two focus group discussions (CI.1.1 in Table 1) were conducted to allow participants from the same language groups to share and communicate all five frameworks (which were made available in both languages). That is to say, all participants were exposed to the explicit knowledge articulated in the (above) *Externalization* mode by all the other groups. Similarities and differences at the group level started to be identified, and became more obvious when participants were asked to share their understanding and raise questions to each other, about both the framework structures and contents. The facilitators continually encouraged participants to refer to experience-based examples during explanations, and these were later collected into a document and disseminated to all participants to read in more detail at their leisure, alongside the five frameworks (CI.1.2 in Table 1). Some time later, two entirely new focus groups were conducted (CI.2.1 in Table 1), where a mix of 2 Chinese-speaking and 2 English-speaking staff were asked to give each other more explicit and detailed illustrations of the meanings contained in the frameworks of their language groups and to answer questions and bridge gaps in understanding through examples. Experience-based illustrations were again encouraged, often involving extension into 1–2 related concepts needing further illustrations, before the two groups could understand each other. Transcripts of these

two sessions were used to develop a 'Booklet of Insights', with seven concepts that both groups deemed important, but involving values-based misunderstandings. This Booklet was later disseminated to all school staff for reading and discussion (CI.2.2 in Table 1).

Secondly, a new round of WeValue InSitu workshops was carried out, this time mixing teachers from different language groups to share, discuss and negotiate their 'shared values' in a new boundary—set to be "What will be important to 'the new us' as a learning community". The emphasis was on envisioning *future* reality and as an integrated group—which meant they had to configure cross-group articulated shared values into organizationally shared values. Ideally, all the teachers would have done this together, but the process was carried out in two separate mixed groups, to keep the numbers manageable. Twenty-two of the 27 teachers participated in CI.3 workshops. The main language used was English to accommodate all participants, but to mitigate the difficulty for second-language participants, and potential power inequality caused by the level of language use, we had facilitators from both languages present. They slowed down the entire process and regularly intervened to give translations in both directions whenever the slightest sign of hindrance was noted. By doing so, we guarded the voice balance and avoided misunderstanding caused by any language barrier but without introducing new content.

Internalization

This SECI phase denotes persons embedding their newly acquired 'combined' knowledge into their actions (Nonaka 1994), and was not designed into this intervention as it usually occurs over a long period of time.

Data collection and analysis

Several qualitative data collection methods were employed to potentially capture details of how and why what happened, including the WeValue InSitu process, one-on-one semi-structured interviews, focus groups discussion and documentation of informal observations and conversations.

Although the *Socialization* step of SECI was assumed, in that the groups already had naturally occurring historical experiences together which shaped their social boundaries, information about these experiences and the resulting boundary was needed, and obtained via key informant interviews (Patton 2002) with four key management teachers of the school (EC.1 in Table 1) at the start of the work.

For the *Externalization*, *Combination* and *Internalization* steps of SECI, the WeValue InSitu process and focus groups were a key part of the design, and the details of the discussions which unfolded in them were valuable data resources for evidence and to support analysis of the values engagement processes. Post-interviews focused on gathering teachers' subjective feedback and interpretations regarding the processes they had gone through (Fig. 2), to enable retrospective examination for evidence for the processes of development of shared understanding and related learning. Open questions like "Could you share your feedback and feeling about the workshop/focus group we had?" were asked first, followed by more specific questions to develop the initial answer in more detail. Almost all the participants participated in these interviews, conducted in their native language, and audio recorded with participants' consent. Interviewees were assigned a unique number for anonymization purposes and used later to label their quotations. For instance, *#24CNP4* refers to the interview with participant #24 in Chinese in the 4th round of post-interview (CC.3.2).

Before content analysis of an event, the researchers carefully read through the verbatim workshop transcription to become acquainted with it (Riessman 1993). Content analysis was conducted to confirm that shared values were in fact created. Iterative thematic analysis was then carried out on the post-interview data (open coding seeking process characteristics and thematic coding), to understand the transformation gained, and the relevant values engagement processes involved. Similar analysis on both the workshop and focus group data was conducted to identify key emerging themes characterizing the processes involved in the development of the shared values. Two researchers conducted the same analyses independently and compared results: a third researcher then reviewed the results and the three agreed with the final results.

Results

Results from implementing each SECI process step

Socialization step results

Through the EC.1 interviews, the four key management teachers each made clear to us that the general atmosphere in the school was good and that a reasonable degree of mutual trust existed. But despite sufficient intention and willingness to learn from each other, there had been limited progress in collaboration between the two types of teachers in fundamental areas such as curriculum design, event implementation and setting of daily routines.

The two types of teachers are not clear stereotypes, but naturally occurring and observed in the school. They were predominantly native English speaking and native Chinese speaking, respectively, and so we label them that way. In fact, there was one native Chinese speaker in the English-speaking group, and the English-speaking group comprised staff with experience in China ranging from a few months to

decades. One group had a wide range of ages, and the other much narrower. In short, they cannot be easily defined by any 'culture' but more easily by the concept of a boundary determined by some set of common experiences.

The key informants perceived the ongoing challenges in school operations as due to a lack of consensus on the meanings of several work-based topics or concepts, which were hindering communication processes and leading to troubling misunderstandings. Teachers did not clarify or were not able to understand intentions of those from the other group, or on what 'mattered the most' within a given context. Consequently, even if a goal was shared and there were good intentions, misunderstandings and differing prioritizations were undermining collaboration. The underlying issue was seen to be the limited common shared values on which to build collaboration. No one was clear on why, what and how to develop that kind of collaboration between the two divisions.

Externalization step results

After the first round of workshops, five shared values-based frameworks (see a sample in Fig. 3) had been produced, one by each group separately. In short, they had externalized, or made explicit, their shared values.

Combination step results

The *Combination* step aimed to foster a transfer of the explicit information across the two group types. After participating in initial focus groups (CI.1.1), and reading information from document CI.1.2, participants gained a comprehensive understanding of their own language groups, and a moderate understanding of the other language group—which they found much more difficult to comprehend. After subsequent (CI.2.1) focus groups and reading insights from document CI.2.2, participants increasingly recognized and comprehended several specific differences of shared values and possible underlying reasons. For example, the Chinese teachers could not understand the foreign teachers' emphasis on creativity, which they associated with unnecessary risk that was only appropriate when a deliverable was already secured, whereas the foreign teachers felt room for creativity in all processes was a prerequisite for high quality deliverables, with a pre-acceptance of some associated risks. In the final step, new shared values were developed across the two group types via CI.3 workshops, using their new boundary of 'the new us'. These could then be used to guide future strategic decision making—as an integrated school.

Internalization step results

The fourth, *Internalization* mode, in the SECI model usually involves experimentation and stimulation of new practices which can take a long time, both to result in changes, and to become tangible enough to be captured. We therefore decided not to probe and disturb the organization during this mode, but instead to elicit information retrospectively via reflections given in CC3.1 and CC3.2 post-interviews. More details on the perceived transformations are presented in the following sub-section.

We would like to make a passing note that, aligning with Nahapiet and Ghoshal (1998) and following Polanyi (1966), we stand for the notion that there is always a tacit dimension involved in all forms of knowledge conversion. That is to say, even though Nonaka et al. (1995) defined the *Combination* mode as the aggregation of explicit knowledge in the wider sense, our adaptation of this term has an extension returning to the earlier intended meaning in Nonaka (1994). Moreover, as discussed above, the SECI spiral happens at multiple levels as a dynamic conversion between tacit and explicit knowledge. Therefore, our second-round (CI.3) WeValue InSitu workshops in the *Combination* mode is essentially a form of organizational knowledge creation involving the *Combination* of explicit knowledge with individual and collective tacit knowledge at both the individual and the group level.

The overall outcomes: development of wider shared values

Using the SECI model as reference, the final outcomes from the *Combination* mode can be regarded as the intended/envisioned shared values. That is, the final negotiated shared values statements constructed by teachers in mixed language groups in the boundary of, *'the new us' as a learning community*. Results are shown in Table 2.

In the transcript data of post-interviews (CC3.1 in Table 1) after the *Combination* mode workshop process, participants confirmed that they considered their shared values statements to be authentic to themselves. In addition, they stated that they now understand better what other teachers want (i.e. 'think is important'), and how they can respond in more appropriate ways, indicating acceptance and ownership of those shared values. For example, one stated,

> "I was able to see their perspective on things. … to understand my Chinese coworkers a little better because I didn't understand why things were happening the way they were. … now I have a good overview." (#8ENP3, Dec 2021).
> "I realized we were so different in mindset…and I think of the advantages of thinking in that way…I used to find questions they asked unnecessary, but now I start to understand why they asked." (#24CNP4, Jan 2022).

Table 2 Shared values statements constructed by teachers from the school when envisioning a common future from CI.3

Mixed group information	Shared values statements beginning with "It's important to us that…"
Group 1 Number of participants: 6 Chinese-speaking teachers 7 English-speaking teachers Duration of workshop: 2 h	People appreciate the differences in each other Our time and effort are used purposefully in a goal-oriented manner To clarify our common organizational goals We clarify our expectations We maintain an open mind and communicate respectfully The limitations within which we are working are acknowledged Expectations are reasonable We have common spaces for teachers to work, collaborate and socialize with one another Creativity is a part of our improvement cycle We are giving + receiving feedback on our work We have a sense of community and a sharing culture We know the broader goals of the organization/team We know how we can do our part in achieving our broader goals To have a common informal space to share, talk, collaborate and work
Group 2 Number of participants: 5 Chinese-speaking teachers 4 English-speaking teachers Duration of workshop: 2 h	We have fun People are not afraid to make mistakes because there are opportunities to learn and improve All opinions are represented We are a community To strive for excellence!

Surprisingly, some participants even reported actions taken afterwards, which are thus outcomes of *Internalization*. Two participants with the same function but different language groups reported they developed an intention which later led to an actual behaviour change: to collaborate to develop a particular new product

> "Through the workshop, I realized how important it is to my colleague that I give my feedback to them immediately. So we had another 30 min talk afterwards to give each other feedback on our previous work. We then decided to immediately try out the new ideas." (#27CNP3, Dec 2021).

Another stated:

> "So, your workshop actually made me act. It is not after the workshop, it is during the workshop." (#6ENP3, Dec 2021)

Moreover, there were two reports of some teachers inviting teachers from another language group to join them for personal gatherings, indicating nurturing of closer personal relationships and more open attitudes for interpersonal interaction.

It should be pointed out that, due to COVID challenges, the final outcomes are only in the form of shared values statements, i.e. lacking the usual framework structure which links them, as seen in those from EI.1 (in Table 1) acknowledge this limitation.

The overall outcomes: perceived transformation

A summary of perceived transformations, synthesized from all the data, is given in Table 3. Both individual and collective level transformations were reported, with many contributing to cross-group collaboration.

There is a shift in the nature of the transformations produced from *Externalization* to *Combination*: they became more interaction orientated, action orientated, work orientated, and ethical. These imply intentions of participants to experiment with actions, which generally occurs after *Internalization* takes place. An example of their recognition of the usefulness of combining values-oriented knowledge and task-oriented knowledge, and taking this forward to new applications, was also seen in interviews:

> "…I think it will be more (like) problem solving… trying to figure out where the problems were made… I think we understand the values and perspectives of different types of staff here (now), it should be more applying the information in (our work)." (#3ENP4, Jan 2022).

This data and the shift seen in the nature of the transformations suggest that the *Internalization* mode had indeed taken place, albeit without any deliberate or external design.

It is noteworthy that intersubjective characteristics can be identified in those perceived transformations (Table 1), e.g. mutual trust, reciprocity to strengthen common practices

Table 3 Synthesized perceived transformations through the process of shared values development

	Externalization	Combination
Individual level	Reflection on self-values with more articulated understanding	Reflection on how to get out from existing routine
	Self-realization of individual values and priorities	Reflection of the desired position within the organization
	Perspective change on certain value topics	Intention to communicate and negotiate with teachers
	Reflection of the desired position within the organization (new work–life balance)	Intention of active self-articulation in communication
		Intention to experiment new ideas
		Intention to build collaboration for problem-solving
		Intention to come up with the best interaction strategy with people by accommodating what they value
Collective level	Recognition of how other people arrange their values	Recognition of how other people arrange their values
	Understanding of other individuals and their previous decisions and actions	Recognition of other people's boundaries in terms of value
	Identification of value similarity and difference among teachers within the same group	Identification of common goals concerning organizational development
	Accommodation to other teachers' way of talking and responding	Accommodation to other teachers' way of talking and responding
	Action towards achieving a specific value	Experimentation to collaborate on new ideas on working tasks
		Increasing communication quality
	Recognition of importance of discussing values-oriented knowledge compared to task-oriented knowledge	Advocating the need of combining values-oriented knowledge and task-oriented knowledge
		Advocating the need of long-term development of shared understanding
	Relational connection and affection	Relational connection and affection
		Sense of equality

and community (Wenger 1998). Intersubjectivity arises from active empathizing with others by putting themselves in someone else's shoes (Husserl 1970), and our design made a space where participants became able and willing to recognize and understand others' values, and this active empathizing is known to nurture intersubjectivity (Von Krogh 1998). They developed affective and emotional reflection on understanding the meaning that others were trying to articulate, not just on an intellectual level but on a deep and emotional level (Nonaka & Takeuchi 2021). Furthermore, they developed intentions to shift from a more cognitive and abstract stance, towards a more action-based, empathic socio-emotional stance that accommodates others' values, which implied a sense of responsibility and concern for others (Plaskoff 2012).

Discussion

By allowing cross-fertilization between concepts from sustainability transformation, theoretical bases of the intervention design (SECI cycle), and the practice-based lessons from the field, we have generated empirical lessons and insights, as brought together in Fig. 4 and discussed below. Specifically, our investigation shows that the Surfacing of values is the *starting point* for individual transformation, and that shared experiences can be a major source for the values to be surfaced, in our case. We then discuss pragmatic implications of our work by underscoring the researcher's role as values broker and suggest the potential of WeValue InSitu method to support transdisciplinary collaboration.

Empirical realization of Perspective 1 and 2: the role of shared experience

This study allows us to illustrate and elaborate on the roles of SECI model's *Externalization* and *Combination* stages in achieving the Surfacing of values (Perspective 1), and Negotiation of values (Perspective 2), as shown in Fig. 4. In the *Externalization* stage, we facilitated articulation of shared values of different groups. As the experience-based, tacit knowledge was converted into explicit knowledge within a specific boundary and context, the groups' shared values surfaced. In *Combination* stage, we facilitated the Negotiation of shared values *across* different groups, on a more-explicit basis developed in *Externalization* mode. With different group participants coming together in a new, wider boundary and again applying both their tacit and explicit knowledge, they produced a new set of shared values marked by their wider shared experience. The boundaries of both original

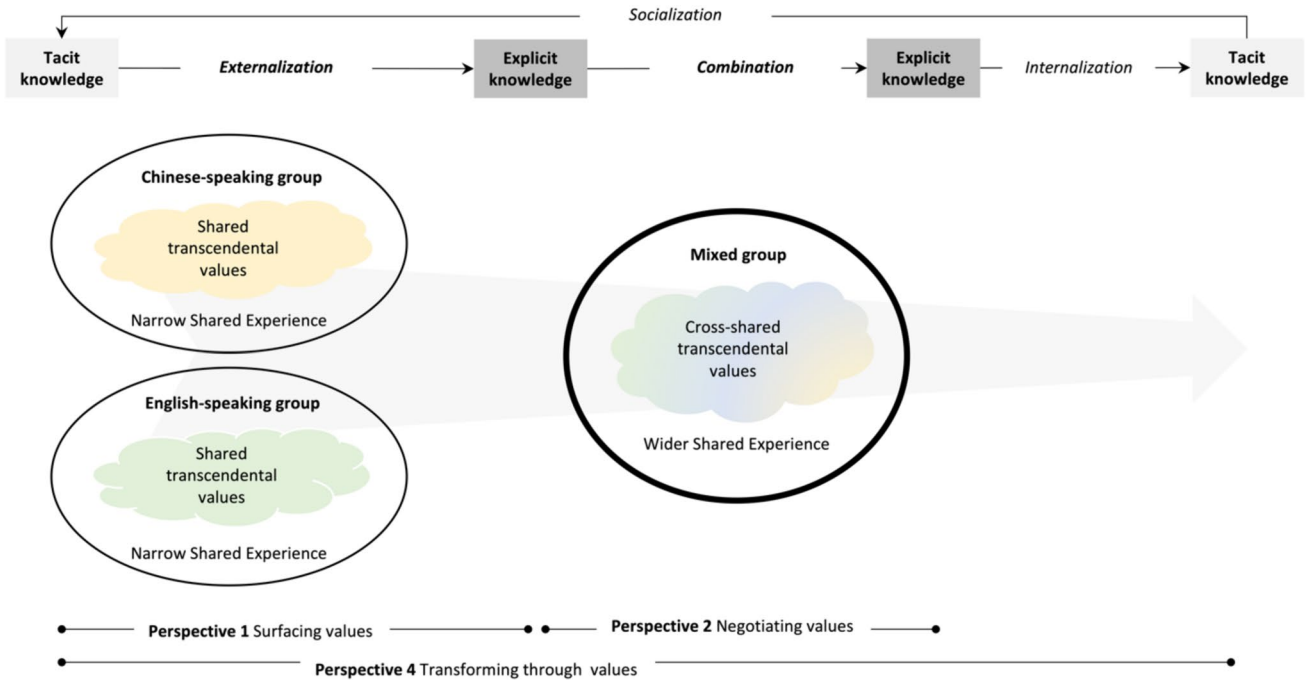

Fig. 4 Schematic illustration of how Perspective 1, Perspective 2 and Perspective 4 are empirically realized through the intervention design based on the SECI model

group types were partly merged and reformed into one new boundary encompassing *all* the teachers in this international school. This allowed them foundations to take onward to guide their future framing of problems and justification of solutions as a new group.

The Four Perspectives (Horcea-Milcu et al. 2019) are presented as interrelated, but without any linear progression or hierarchy of elements of process implied. However, insights from our case imply a preferred sequence of Perspective 1 occurring first, followed by Perspective 2, due to the tacit nature of transcendental values requiring Surfacing before it can be communicated in the negotiations. It is worth noting that values were constantly being considered and reconsidered between the individual level and collective group level, but we simplify our discussion here by not dwelling on the micro level, i.e. personal learning occurring within an individual, but acknowledge there is room to further explore that level, especially with respect to concepts of inner sustainability (O'Brien 2018).

The role of experience, especially shared experience, stands out. It seems to be the main resource of the Surfacing values (Perspective 1) and also lies at the core of the SECI model for continued knowledge creation. People can only surface what already exists and is in place, i.e. long-term transcendental. Those values we wish to elicit and make more explicit are embedded in experiences, and we assume they are manifested in daily actions where they guide the decision-making (Stern et al. 1999). Meanings of transformation are acquired from experience of transformation (Duncan et al. 2018) and engagement in meaning-making (Linnér and Wibeck 2021); hence, values as a component of individual meaning-making (O'Brien 2021) acquire the meanings from experience. In the SECI model, the spiral starts with *Socialization* where new tacit knowledge is shared among individuals through shared experiences (Nonaka et al. 2000). That is, both *Externalization* and *Combination* require a flow of knowledge that originates from *Socialization,* to feed the continuum of knowledge creation. Experience, among all things, is the basis of *Socialization*, starting with individual experience which becomes shared experience. Only through shared experience, where interaction, observation and imitation happen, can tacit knowledge be acquired (Nonaka 1994). Our intervention design builds on this premise of shared experience as the basis for the shared tacit knowledge through which transcendental values are manifested and become meaningful. In this case, the teachers have been working together for a long time and thus have acquired shared experience from *Socialization* already. This occurs even when there is limited collaboration between the teachers, because they experience much of the same context while at the same small school.

A lesson to take forward to other studies and practices is thus to obtain values Surfacing (Perspective 1) through *Externalization*-type processes and values Negotiating (Perspective 2) through *Combination*-type processes. However, since both rely on a good foundation from shared experience

through *Socialization,* we deduce the strong recommendation to involve people who have some kind of boundary of shared experience. They can then surface the experience-related shared values and go on to negotiate the explicit representation of them.

This finding also adds to recent efforts to focus on 'inner worlds' (Ives et al. 2020) by echoing the importance of Phronesis, because experience is considered the source of practical wisdom (Polanyi 1966) and is recognized as essential for sustainability transformation (Caniglia et al. 2023; Fazey et al. 2018a, b; Peters and Wals 2013). It is also considered the key resource for business leaders to draw on for strategy to become more future oriented, society focused, dynamic and human-centric (Nonaka and Takeuchi 2021).

Noting that Perspective 1 was discussed mostly with respect to emerging scientists' transcendental values for transdisciplinary collaboration, we claim that although our case did not address the scientific community, the international school teacher community also suits that research purpose, in that they are groups from different cultural backgrounds with different first languages, implying differences in transcendental values underpinning their perceptions, decisions and actions. We wish to provide insights that go beyond eliciting just the scientists' transcendental values, to also acknowledge and include other stakeholder groups that are critical in realizing transdisciplinary collaboration.

Interaction of the Four Perspectives: surfacing values as the starting point for individual transformation

Our results of the perceived transformations in Table 3, showed individuals conducted behaviour change (e.g. spontaneous cooperation) and developed intention to incorporate values into real action. We view these intersubjective transformations as foundations for subsequent transformations, e.g. specific collaborations in the school. These results imply that the transcendental values Surfacing (Perspective 1) and Negotiating (Perspective 2) is inherently related to, and have impacts on, the subsequent transformation through values (Perspective 4), in that they both can trigger development in the inner dimension of sustainability of individuals, which is increasingly acknowledged to be important for transformation in sustainability science (O'Brien 2018). In our case, as shown in Fig. 4, the Surfacing of values preceded the other stages, and thus contributed to their processes.

Drawing on the organizational Knowledge Creation Theory, the SECI model starts from individual's inner realms of where tacit knowledge is embedded, and can be viewed as a social process of validating truth (Nonaka 1994). Individual subjective knowledge created out of experience is shared and justified by others, i.e. validated socially and synthesized (Nonaka 1991), before becoming shared collective knowledge. More specifically, we argue that Surfacing values is an *Externalization* process. This process involves constant individual reflection, as their tacit knowledge being converted into explicit knowledge (Nonaka and Toyama 2005), and may trigger double-loop learning where fundamental beliefs, values and assumptions are critically challenged and reflected (Argyris 1977). Despite our group-level work being framed as the *Combination* process in this study, the Negotiating of group values is ultimately a process nested on individual-level values Surfacing processes. This can also be linked to the notion of social learning processes, defined as "a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks" (Reed et al. 2010). This again reinforces the significant role of values and inner dimension as leverage points for transformation (Abson et al. 2017; Fischer and Riechers 2019; Horcea-Milcu 2022; Woiwode et al. 2021).

This brings us to further consider the connection between transcendental values and contextual values—one of the main intentions outlined in our introduction. The former informs decision-making and behavioural conduct fundamentally, and the latter incorporates pragmatic aspects to develop more actionable solutions. Both are important for transformation towards sustainability. Our findings show that Surfacing and Negotiating transcendental values within a social boundary based on shared experience can lead to an intention to increase values-based thinking, and to an increased connection of values to specific problem-solving (see Table 3). Therefore, we argue a balance between engaging transcendental values and contextual values should be pre-considered in transformation projects. If there is firstly an appropriate degree of meaning-making of existing, held, transcendental values within a relevant boundary, then this might allow generation of a comprehensive understanding of one's own life at the individual level. This can then form a good basis for developing *shared* contextual values, in a shared frame of reference, where sustainability problem contexts can be introduced (Perspective 3). This understanding is in line with the conceptualization of the social process of deliberation in the deliberative value formation model, i.e. feeding into a translation of transcendental values to a specific context (Kenter et al. 2016a, b).

The intervention design for sustainability transformation: researcher's role and transdisciplinary collaboration

Following the need for balanced power dynamics which mediate social learning (Kenter et al. 2016a, b), we discuss the contribution of this work to the idea of utilizing a 'values broker' which is seen to be helpful in mediating expressed

competing values to prevent conflict (Horcea-Milcu et al. (2019) citing e.g. Ingold and Varone 2012). We argue that the facilitator of the WeValue InSitu process is a promising role for researchers to take, which grants them to be the one authorized to balance the dynamic in discussions, and enables them to foster social learning intensively. There is another facet whereby researchers can also engage in the process, intentionally avoiding participating in negotiations of decisions, and instead raising awareness of and reflecting on how *their own set of values* aligns or conflicts with the group under study. The session can then provide time and space for a researcher's personal reflection (Raymond et al. 2010) and promotes their inner-oriented understanding of reality, consequently helping them sort out their intended and possible role(s) as researchers (Wittmayer and Schäpke 2014), or even to become campaigners of impactful research to policy, in turn promoting "explicit recognition and communication of personal values underpinning research and impact" (Reed and Rudman 2022). The above also responds to the current ongoing discussion in sustainability science regarding the importance of subjectivity and the personal sphere (O'Brien 2018).

One more seemingly far, but naturally close, area this work could speak to, is transdisciplinary collaboration research, where researchers with different knowledge systems and underpinning values systems try to bring them together. Our intervention design presented in this work, including the WeValue InSitu method, can clearly contribute to promoting Phase 0 (Horcea-Milcu et al. 2022) in transdisciplinary collaboration by providing a well-designed facilitation tool. Togetherness with shared values—"Creating coherence at the level of intent is a powerful way to support co-creation across all of Phase 0"—is recognized to be impactful throughout the whole transdisciplinary process, in that (a) it leads to trust building on the science–policy interface and (b) engagement with individual and collective values are considered to generate high leverage for sustainability transformation (Abson et al. 2017). This is precisely what we did in the study utilizing WeValue InSitu process and the intervention design. We would argue that developing shared values of the group based on pre-existing individual transcendental values through an intensive reflexive process provides a platform for dialogues and collaboration to be cultivated concerning diverse contents, e.g. goals, time and trade-off management. Moreover, the WeValue InSitu process is highly reflexive, and this helps reveal the potential of values to cultivate change internally (Davelaar 2021).

Conclusion

The work presented here makes a contribution to the call for more research about the nature of, and linkages between, values engagement processes in the pathway towards sustainability transformation. The target transformation chosen was to move two groups that did not collaborate to a point where they collaborated well, thus becoming better prepared for taking on specific sustainability challenges. The intervention design was informed by the SECI cycle of moving more-tacit and individual knowledge to more-collective and explicit knowledge, and back into internalized embodiment in a new form. In this case the knowledge focused upon was the group shared values-in-action.

Our study found that the values-engagement processes revealed in our successful intervention relate well to the Four Perspectives notions of 'Surfacing' and 'Negotiating' of values, with an enriched understanding. Our results showed that the existence of common shared experiences of participants provided an absolutely crucial underlying basis for the success of the intervention, because it provided a bounded pool of values already known (mostly tacitly) to the participants, which could then be 'surfaced' into explicit awareness and articulated statements. These could then be more easily 'negotiated' across the group types: the sequence is noteworthy.

Furthermore, although these two types of values-engagement processes were originally proposed in the Four Perspectives approach within the context of researchers and local people being two group types with different values, our results suggest that this conceptualization is much more widely applicable, to any groups who have shared experiences which can be surfaced, and then communicated and negotiated. The Surfacing creates raised awareness of the values-in-action held, and thus a greater possibility to explore them to discover similarities and differences with other groups which are trying to move together towards sustainability. This is a solid foundation for preparedness for sustainable transformations.

Our study thus demonstrates: empirical evidence of values-engagement processes (and specifically, which relate to the Four Perspectives); the crucial importance of having a pool of shared experiences as a basis for working with these values-engagement processes; and of the potential of utilizing the SECI model to plan the utilization and sequencing of them to achieve sustainability transformations.

For future studies, we suggest that this use of a values lens is worthwhile to try in wider and more central sustainability transformation contexts, e.g. ecosystem services and climate change adaptation. Secondly, we call for research to examine to which extent the values-based design we provide in this work could be incorporated and function as a mode-2 pathway (Horcea-Milcu et al. 2022) to engage with values relationally as leverage points for transformation study. Thirdly, the basis of this work and its findings—the conceptualizing of values as a form of tacit knowledge—would benefit from a more fundamental debate.

Data availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical approval This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by a University of Brighton Ethics Committee.

Informed consent Written informed consent was obtained from all subjects.

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