

This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.

Author(s): Ramamoorthi, Bhavani; Jäppinen, Aini-Kristiina; Taajamo, Matti

Title: Co-sensing and co-shaping as shared and relational practices in bringing about relational leaders in higher education

Year: 2021

Version: Published version

Copyright: © 2021 the Authors

Rights: CC BY 4.0

Rights url: <https://creativecommons.org/licenses/by/4.0/>

Please cite the original version:

Ramamoorthi, B., Jäppinen, A.-K., & Taajamo, M. (2021). Co-sensing and co-shaping as shared and relational practices in bringing about relational leaders in higher education. *SN Social Sciences*, 1(8), Article 211. <https://doi.org/10.1007/s43545-021-00210-w>



Co-sensing and co-shaping as shared and relational practices in bringing about relational leaders in higher education

Bhavani Ramamoorthi¹  · Aini-Kristiina Jäppinen²  · Matti Taajamo³ 

Received: 7 September 2020 / Accepted: 14 July 2021
© The Author(s) 2021

Abstract

The aim of this article is to investigate how and what kinds of relational and shared practices were co-created within a multicultural team in a higher education collaborative learning environment. The students interacted while working towards the shared goal of co-constructing knowledge. The study provides insight into how student teams can actively build collaboration in learning spaces through manifesting relational leadership. Shared and relational practices refer broadly to all the knowledge, attitudes and skills that emerge from team interaction. A compound theoretical framework combining relational leadership and leadership trichotomy was adapted to study what particular factors enable shared and relational practices. The qualitative study drew data from students' reflections and group discussions in an intervention which served as a space for experimentation in collaboration and dialogue. The results showed that the students practised Co-sensing and Co-shaping to effectively allow knowledge co-construction. A broadening perception of diversity and the perception that barriers were a doorway to new relational possibilities enabled Co-sensing and Co-shaping to work in collaboration. The results of the study could provide new insights for other kinds of higher education learning environments.

Keywords Higher education · Relational leadership · Shared and relational practices · Collaborative learning · Knowledge co-construction

✉ Bhavani Ramamoorthi
bhramamo@student.jyu.fi

Aini-Kristiina Jäppinen
aini-kristiina.jappinen@jyu.fi

Matti Taajamo
matti.taajamo@jyu.fi

¹ University of Jyväskylä, Jyväskylä, Finland

² Faculty of Education and Psychology, University of Jyväskylä, Jyväskylä, Finland

³ Finnish Institute for Educational Research, University of Jyväskylä, Jyväskylä, Finland

Introduction

A large number of studies in higher education examine learning from a perspective that draws on knowledge co-construction in collaboration (e.g. DamŞa et al. 2013; Heo et al. 2010; Van Schalkwyk and D'Amato 2015). A majority of them examine online virtual learning environments (Heo et al. 2010; Putambekar 2006; Zheng et al. 2015) and a few focus on class-based learning in the context of higher education (Ahn and Class 2011; Van Den Bossche et al. 2006).

It is by *social interaction* that individuals in these environments construct knowledge, share existing ideas and create new ones as a collective accomplishment by means of *shared and relational practices* (Greeno 2006). The perspective of sharing and relations is adopted in this article to explore how shared and relational practices in social interaction contribute to knowledge co-construction in higher education learning processes.

Studies that focus on collaborative learning in higher education include knowledge as an important aspect of the environment (Hong and Sullivan 2009; Lai 2015). Many studies relating to collaborative learning examine knowledge building, knowledge creation, problem solving and the implementation of ideas regarding learning in interaction, especially in small group settings. Among current studies in higher education, few concentrate on face-to-face learning with a focus on how students work together towards knowledge co-construction. In such a context, social interaction becomes a fundamental element of collaboration (Valsiner 1994).

Collective and socially constructed learning is highly important in the global, interconnected society. Consequently, it is essential that higher education research also focuses on practices in collaboration (Kezar et al. 2006) for effective learning processes. This article looks particularly at the *co-creation of relational and shared practices* in collaborative interactions among a multicultural team of higher education students. In examining this, we benefit from the idea of social constructivism. This study does not use this theory to examine shared and relational practices but rather utilizes it as the context for knowledge construction in shared learning environments. In these environments, learning and knowledge co-construction are not viewed as individual experiences but as a shared one, realized through shared and relational practices (Järvelä and Järvenoja 2011; Wilkinson 2011).

In knowledge co-construction, the theory of relational agency in practice (Edwards 2005a, 2011) adds knowledge on how the ability to engage with the world is enhanced by working with others. Knowledge co-construction requires an environment or system that is open and allows for relational agency to emerge. There is fluidity in the learning space (Hosking 1988) that allows for one to seek help and give help when needed. It helps to understand what mediates collaboration across practice boundaries (Edwards 2012) as team members align their resources towards achieving a shared goal (Edwards 2005b).

In order to study shared and relational practices that are co-created in a socially constructed learning environment, the theory of *relational leadership* is

used (Cunliffe and Eriksen 2011; Pearce and Manz 2005; Uhl-Bien 2006). Relational leadership is a relational and ethical process wherein people attempt to effect positive change (Komives et al. 2013). The theory has gained interest in recent years (Drath 2001; Endres and Weibler 2017; Uhl-Bien 2006), and a large number of studies have concentrated on organizational teams and the interaction among team personnel (Crevani et al. 2007; Cunliffe and Eriksen 2011; Fairhurst and Uhl-Bien 2012).

This paper contributes to the existing need for literature of relational leadership in higher education with a focus on the students. Studies on relational leadership in the context of higher education are limited and fall mainly into two categories. First, there are studies on leadership within systems, which focus on people in positional roles in leadership (Biddix 2010; Branson et al. 2016; Kezar et al. 2006). Fewer studies focus on relational leadership among higher education students (Caviglia 2010; Komives 2012; Komives et al. 2006). Those that do exist usually aim to understand how leadership identity is constructed, and how leadership capacity is built among students. These studies are based on social change leadership models (Komives 2012; Komives et al. 2009). Our study adds a fresh perspective, specifically relational and shared practices executed in collaboration.

These practices are examined through a leadership ‘trichotomy model’ of *knowing-being-doing* (Komives et al. 2013; Snook et al. 2012). In applying this model, we gain understanding of how a multicultural group functioned as a team and achieved its purposes in collaboration through shared and relational practices. The reason to conduct the study among a multicultural group of students was to examine the phenomenon in an environment that requires a deeper sense of relational connection and interdependence, integrated through shared and relational practices. This learning process differs fundamentally, for example, from the process involved when students have similar cultural backgrounds and share the same language.

Consequently, the study was conducted in a particular learning environment—called the Collaboratories Lab—with a group of multicultural students whose learning interactions were led by inquiry and deep questioning. The lab provided an adequate context within which to examine shared and relational practices and, in particular, the factors that enabled the students to flourish despite inevitable barriers. It was a self-designed intervention in which the students worked towards building shared knowledge on collaboration and were empowered by social interaction. The shared and relational practices that were co-created during their collaborative interactions were examined. The students’ individual and group reflections and learning assignments were viewed through the relational leadership theory and the knowing-being-doing model.

Collaboratively and socially constructed learning

Individuals acquire knowledge from interaction in social situations. Scardamalia and Bereiter (1994) state that in collaborative knowledge-building communities, students increasingly take charge of their learning, lead discussions, offer new perspectives and learn in dynamic social environments. Thus, groups of people are

acknowledged as the source of knowledge construction. Consequently, it is expected that student teams that bring together people with different experiences, values and knowledge are more effective than individuals at solving problems. However, to be able to solve problems adequately, the students may face challenges in integrating different perspectives and developing a shared understanding of the problem at hand. This can be accomplished through rich interaction, interactive discussion and negotiation (Van Den Bossche et al. 2006). An essential ingredient of collaborative learning is the interaction between individuals and collaborative learning activities, which are intrinsically interactions between diverse perspectives that enable shared knowledge building (Puntambekar 2006). Individuals bring their unique knowledge and perspectives to the learning space, creating new understandings based on the interactions.

A large number of studies on collaborative learning in higher education rely on the theory of social constructivism (Gewerc et al. 2014; Marzouki et al. 2017). Therefore, we will use social interaction as the larger framework to aid in understanding how higher education students co-create shared and relational practices. Social constructivism emphasizes that social realities are intersubjectively constructed in everyday interactions (Endres and Weibler 2017; Prawat and Floden 1994). It represents knowledge as a human product and states that meaningful learning occurs when individuals are engaged in social activities such as interaction and collaboration (Von Glasersfeld 1995).

Social constructivism emphasizes that the world becomes socially meaningful when it is interpreted in relation to other subjects rather than reality constructed through subjective humans acts (Endres and Weibler 2017; Fairhurst and Grant 2010; Hosking 2011; Uhl-Bien 2006). Meanings are produced on an ongoing basis while structures are created that are stable but allow for change as interactions evolve over a period of time (Fairhurst and Grant 2010). Instead of focusing on the subjective experiences of people involved in relationships, another way to study these team interactions is to synthesize the relational spaces among team members as relational leadership (Crevani et al. 2010; Cunliffe and Eriksen 2011), which is at the core of this article.

Relational leadership as the theoretical perspective to examine shared and relational practices

There is a growing body of leadership literature that examines leadership as a collective phenomenon, that is, in plural terms in which different people interact with a shared goal and purpose (Crevani et al. 2007; Endres and Weibler 2017; Raelin 2011). Diverse labels such as ‘shared’ (Fletcher and Kaufer 2003; Kocolowski 2010; Lambert 2002), ‘distributed’ (Drath et al. 2008; Spillane 2005), ‘collective’ (Hilliard 2010; Raelin 2011, 2014), ‘relational’ (Crevani et al. 2010; Fairhurst and Uhl-Bien 2012; Uhl-Bien 2006) and ‘post-heroic’ (Collinson 2018; Crevani et al. 2007) are used to define the phenomenon. Literature on plural notions of leadership consider leadership to be a process that stretches across many actors (Denis et al. 2012; Spillane 2005).

Leadership in plural is more likely to develop in contexts where individuals have distinctive expertise requiring them to exert some autonomy to achieve task integration with others (Denis et al. 2012). This collaboration is more than the sharing of knowledge and information. The purpose is to create a shared vision and strategies that address concerns that go beyond the scope of any particular party (Komives et al. 2013). Consequently, scholars highlight the need for a new vocabulary that emphasizes the practices contributing to setting a direction (Barge and Fairhurst 2008; Cunliffe and Eriksen 2011).

The perspective that leadership is situated in interactions can be associated with the term relational leadership and constitutes an effort to view leadership as embedded in rich human connections and interdependencies among members in an organization (Denis et al. 2012; Uhl-Bien 2006). Consequently, we will use the concept of relational leadership as our first theoretical framework to examine shared and relational practices in co-constructing knowledge.

There has been a strong need to re-conceptualize leadership as something that evolves in social interactions with an emphasis on relationships (Crevani et al. 2007; Pearce and Manz 2005; Raelin 2011). From a relational perspective, leadership is viewed as a social reality and emergent property that is embedded in a context (Dachler and Hosking 1995; Hosking 1988). In relational leadership, diverse people shape and create the context, contributing new meaning to a shared purpose and goal (Caviglia 2010; Komives et al. 2013). Uhl-Bien (2006, p. 655) defines relational leadership as ‘a social influence process through which emergent coordination (i.e. evolving social order) and change (e.g. new values, attitudes, approaches, behaviors and ideologies) are constructed and produced’.

In relational leadership, the interdependencies among team members leads to an emerging social order (Hosking 1988). Hence, leadership is not restricted to hierarchical roles but occurs in dynamic relations throughout an organization, among a group of people. When the focus on individual attributes associated with leadership is removed, the attention shifts to exploring the ways by which members collaborate and move relationally through dialogue with each other (McNamee 2012). Here, shared and relational practice become the focus.

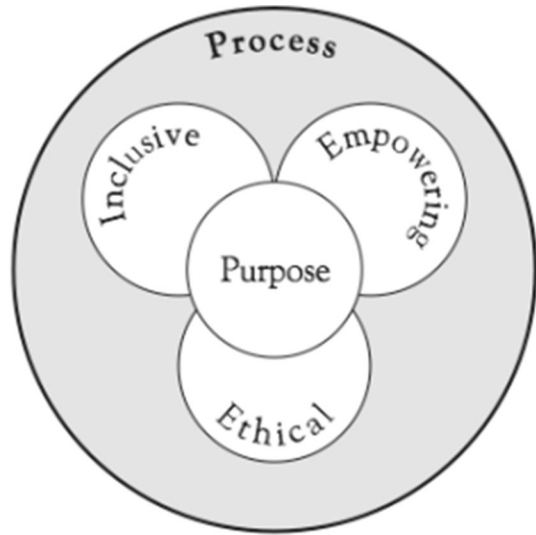
Connecting two complementary leadership models to examine shared and relational practices

In order to examine the shared and relational practices that were co-created by the student teams, this study utilizes two leadership models, the relational leadership model and the knowing-being-doing model.

The relational leadership model

The first model is the relational leadership model (Komives et al. 2013), which describes relational leadership as *purposeful, inclusive, empowering and ethical* (see Fig. 1). This model is essentially developed from higher education studies

Fig. 1 Relational leadership model. *Source* Komives et al. (2013)



that relate to the development of leadership identity (Komives et al. 2009) and socially responsible leadership (Dugan and Komives 2010).

This model provides a perspective to examine shared and relational leadership practices within diverse learning groups or teams. Individuals can make a meaningful contribution to teamwork when they utilize shared and relational practices created within the common learning process. *Purpose* is situated at the center of the model since it provides the context and focus of leadership. According to Komives (2013), relational leadership is purposeful when it refers to one's commitment to a goal or activity, finding a common direction and building a shared vision to create a positive change.

Inclusive relational leadership means understanding and engaging in a diversity of views, approaches that include aspects of individuality, gender and culture. Valuing equity and exercising web-like thinking where one sees webs of connection in resolving issues are essential elements of inclusivity. Relational leadership is also *empowering*. The two main dimensions of empowerment are the sense of self-leadership felt by an individual who claims a place in the group process and the environment that promotes participation by mitigating any barriers to individual involvement (Komives et al. 2013; Shertzer and Schuh 2004). Empowering and increased learning at the individual level contribute to a team's strength and collective progress (Kezar et al. 2006). Finally, the relational leadership model emphasizes *ethical* and moral leadership; ethics are at the core of leadership, and without ethics leadership cannot emerge (Ciulla 1998; Komives et al. 2013).

In this study, all the shared and relational practices are considered integral parts of a socially constructed learning environment, as illustrated in Fig. 1. Importantly, the socially constructed learning environment builds the essential synergy for the co-creation of shared and relational practices.

The knowing-being-doing model

The second leadership model is that of knowing, being and doing (Snook et al. 2012), which examines knowledge, attitudes and skills as the three essential pillars of leadership. The relational leadership process calls for those who are engaged in it to be knowledgeable (knowing), to be aware of self and others (being) and to act (doing); the knowing-being-doing model as the second perspective is a holistic approach toward leadership development (Komives et al. 2013; Snook et al. 2012). The three components are interrelated, with Komives et al. (2013, p. 100) explaining that ‘the knowledge you possess can influence your ways of thinking, which can influence your actions’. In addition, the way that one exists in this world (being) influences actions and behaviors. This interrelated pattern is a circular path (Komives et al. 2013). The ‘being’, or the attitudinal domain, is characterized by deep, enduring structures of the self: how the learner engages issues of personal integrity and purpose, with a focus on the ethical dimensions of life. Educators have considered this to be the most crucial goal of higher education (Mentkowski & Associates 2000, as cited in Snook et al. 2012).

To study the learning process of relational leadership and the shared and relational practices that result from this process, it is important that one acquires knowledge (knowing), integrates that knowledge with beliefs and attitudes (being) and applies these attitudes and knowledge in daily life as action (doing). This framework is used to study an individual and a group for leadership in its three key dimensions. Consequently, this article uses the knowing-being-doing model as its second source of theory (Komives et al. 2013).

Students who already possess wisdom and expertise enter an educational context with questions, a history of learning relationships and diverse ways in which they connect to the subject matter. The richness of their learning and knowledge co-construction is further heightened with added understanding of the relational space where they exercise shared actions with fellow students. This can lead to deeper shared and relational practices in higher education learning environments (McNamee 2012) in terms of relational leadership embedded in social interactions.

The two models used in this article to study the relational space arise from two different paradigms. These paradigms serve as lenses through which to study interactions among students and their co-created shared and relational practices. Both models have their own distinct features of leadership, enriching our understanding of the relational space of knowledge construction. This lends new meanings and deeper connections to socially constructed higher education learning environments.

Method

We will exploit the relational leadership model combined with the knowing-being-doing model as our theoretical framework to examine the shared and relational practices that a multicultural group of higher education students created in knowledge construction together. Consequently, the research questions are as follows: 1. What kind of relational and shared practices do higher education students create in

collaboration to co-construct knowledge? 2. What factors enable, in particular, the co-creation of shared and relational practices?

Study context

The paper is based on an international study course called the Collaboratories Lab. The Collaboratories Lab was a self-designed intervention designed by the first author where students worked towards building knowledge capital on collaboration. Their areas of specialization (in their degree) included psychology, teacher education, special education and educational leadership. Prior to the start of the course, the participants were informed of the study's content and aims as well as their rights to anonymity. The main element of the course was to introduce collaborative activities centered on education that involved working in small groups or as a class. Dialogue was an integral part of these activities. This was followed by an online discussion with reflections based on students' face-to-face learning experiences, around their experiences of working in groups.

In the Collaboratories Lab, the students engaged in immersive collaborative activities enabled through multimodal engagement, such as collaborative games, theater, appreciative inquiry, art and dialogue. This lab was designed based on experimental collaborative exercises such as the marshmallow challenge (Al-Khalifa 2017; Anthony 2014; Suzuki et al. 2016). It also included collaborative activities based on theater and storytelling (Auvinen et al. 2013; Boje et al. 2015; Orr and Bennett 2017). A major part of the course involved students actively engaging in the practice of appreciative inquiry, which is a model for solving problems through a creative thinking process that has been studied in context to collaboration and relational leadership (Bright et al. 2006; Sim 2019).

Data

The Collaboratories Lab included eight students, five of whom were exchange students and three of whom were pursuing a master's degree in education. The multicultural group consisted of two men and six women from five different countries: India, Taiwan, Japan, Wales and Italy. The students were assigned pseudonyms to protect their anonymity (Table 1). The group interacted face to face in class meetings of either two hours or four hours each. In total, there were 30 contact hours. The students also spent approximately 30 h in group reflections and online discussions following class interactions, and the course was worth 5 ECTS (requiring approximately 135 h of work). They met for 11 contact sessions over a three-month period.

The data for this paper include students' individual and group reflections on the discussion forum and their final learning assignment, which was to assemble a collaboration tool kit meant to aid their future roles in education. Their face-to-face group discussions were audio- and video-recorded. The audio recordings were transcribed into text, and thematic data analysis was conducted. Paintings and visual products were also produced by the students as part of the course. However, these visual data were not used in this article.

Table 1 Details on the study participants

Participant pseudonym	Gender	Country	Student role	Degree program
Audrey	Female	Taiwan	Full-time student	Master's degree
Cecilia	Female	Wales	Exchange student	Bachelor's degree
Diana	Female	Italy	Exchange student	Bachelor's + master's five-year degree program
Emma	Female	Italy	Exchange student	Bachelor's degree
Gina	Female	India	Full-time student	Master's degree
Samantha	Female	Italy	Exchange student	Bachelor's + master's five-year degree program
Steven	Male	India	Full-time student	Master's degree
Thomas	Male	Japan	Exchange student	Bachelor's degree

Analysis

Data coding followed the model of thematic analysis suggested by Braun and Clarke (2006). Thematic analysis is a method for identifying, analyzing and reporting patterns (themes) within data. The thematic analysis was conducted deductively so that existing theoretical concepts informed the coding and theme development, allowing the analysis to move beyond the obvious meanings in the data. The themes were derived by connecting the relational leadership model and the knowing-doing-being model, in accordance with Komives et al. (2013) (Table 2). The data were first scrutinized through the lens of these models so that existing criss-crossed conceptualizations informed the coding and theme development (Table 2).

The research team consisted of three members. The first author was in charge of analyzing the data. The second and third authors were involved in the article writing process and provided support with the necessary literature, guided the methodological process and checked the analysis systematically. The first author provided the data to all of the team members. The data were discussed during the research team meetings, and it was determined that the data accurately represented the information provided by the participants. The first author marked and coded in the text those places that represented the criss-crossing conceptualizations of the two models. Each code was given a description to identify what it represented with regard to the different analytical units (i.e. parts of sentences, whole sentences or larger sections). The practical data coding was conducted using the Atlas.ti software.

Two major themes of co-sensing and co-shaping as shared and relational practices arose from the thematic analysis. The criss-crossed conceptualizations for co-sensing mainly embodied web-like thinking, being open to differences, believing everyone can make a difference, encouraging and affirming others and building coalitions. These all represent practices that enabled the students to experience themselves as one interconnected working organism with rich interdependencies integral to their learning interactions. Co-shaping is a synthesis of the conceptualizations of

Table 2 Criss-crossing conceptualizations of the two models

Knowing-being-doing model		Knowing	Being	Doing
Relational leadership model				
Purpose		Common purpose Shared values	Commitment	Creative thinking Envisioning Involving others in the vision-building process
Inclusive		Self and others	Web-like thinking Open to differences Values equity Believes everyone can make a difference	Building coalitions Framing and reframing Listening skills Civil discourse
Empowering		Power	Willing to share power Values others' contributions	Individual and team learning Sharing information Promoting a sense of self-leadership Encouraging or affirming others
Ethical		Ethical decision-making Self and others' values	Establishing sense of personal character (being authentic) Expects high standards	Being congruent Being trusting Having courage

Applied from Komives et al. (2013)

common purpose, commitment, envisioning, framing and reframing, the promotion of self-leadership and the willingness to share power. Co-shaping represents the students operating as one collective team leading them towards a shared goal. Examples of the major themes of co-shaping and co-sensing are presented in Table 3.

Criss-crossing the two leadership models also helped clarify how the practices enabled the team to exceed the inevitable barriers that always arise in multicultural higher education learning settings. Here, the data from co-sensing and co-shaping were utilized based on the answer to the first research question and the theoretical framework of relational leadership. The theory lends the elements synonymous to co-shaping and co-sensing that enabled the team to overcome barriers. Integral to relational leadership are a shared vision (Komives et al. 2013) and the way in which diverse people shape and create the context and contribute new meaning to a shared goal (Caviglia 2010; Komives et al. 2013). Embedded in these interactions are rich human connections and interdependencies (Denis et al. 2012; Uhl-Bien 2006) with the emerging social order and the new values, attitudes, approaches and behaviors that are constructed and produced (Hosking 1988; Uhl-Bien 2006). Members collaborate and move relationally through dialogue (McNamee 2012), actively practicing relational leadership and exercising shared and relational practices.

Findings

The first research question aimed to examine what kinds of relational and shared practices multicultural higher education students use in collaboration to co-construct knowledge. The purpose of the first research question was to define the concept of shared and relational practices. Several conceptualizations (Table 2) were identified. They concerned the way the team operated when they worked to co-construct knowledge in collaboration. From the thematic analysis (Table 2), two main themes arose: co-sensing and co-shaping (Table 3).

The shared and relational practices of co-sensing

The students were aware of their relational interdependence in functioning as a team to achieve a common purpose. Being able to observe themselves and their interconnectedness in the team helped them work towards knowledge co-construction with commitment and inclusivity. We labeled this *co-sensing*. This term originates from a leadership Theory U designed by Otto Scharmer (2009) to use systems thinking and learning to collectively actualize an emerging future. Co-sensing involves creating a social field of relationships between individuals, exercising deep observation to connect diverse people and places and sense the system as a whole. Here, the criss-crossed sections utilized were web-like thinking, being open to differences, encouraging and affirming others, believing everyone can make a difference and building coalitions (Tables 2, 3).

Consequently, in this article, co-sensing refers to the relational and shared practices of the team when the members sensed themselves as one interconnected organism. Even though the students came from varied cultural and learning backgrounds,

Table 3 Examples of the conceptualizations in criss-crossing the two models

	Knowing	Being	Doing
<p>Relational leadership model</p> <p>Purpose</p>	<p><i>Common purpose</i> In the beginning, we weren't aware of others' thoughts and ideas, but when we spoke for hours, we found a common ground^a. I think this common ground helped you to put the linguistic competence in the back and put your ideas in front. (Gina)</p>	<p><i>Commitment</i> It expresses and underlines a passion perspective that makes me think that an effective collaborative team of people not only should share a common aim ground^a but should also be passionate and determined. ground^a (Diana)</p>	<p><i>Envisioning</i> By learning in this context and thanks to collective inquiry, we can see others' points of view^b, and build new horizons on the topic, and then we can come up with more effective solutions^a or ideas about the issues, whether the issue is positive or negative. (Thomas)</p>
<p>Inclusive</p>	<p><i>Self and others</i> I think most people experience some factors or conditions that may limit them from fully enjoying the experience.... I sympathized...that you were not able to express your opinion or share stories fully because of the language barrier... It is particularly important to acknowledge the 'negative aspects' and appreciate their presence to work with them^b = appreciative inquiry. (Cecilia)</p>	<p><i>Web-like thinking</i> Collaboration involves 'people', co-creation involves 'partners'^b. (Steven)</p>	<p><i>Building coalitions</i> Being in a small group I was stimulated to give my opinion and I felt part of the group^b and even if my difficulty with English did not always favor the work, the members of the group were very patient so the work was not limited by this^a. (Samantha)</p>

Table 3 (continued)

	Knowing	Being	Doing
Relational leadership model			
Empowering	<p><i>Power</i> For the strategies on how to overcome fear...For me usually is to get to know better the problem, I found this power in knowledge that helps me overcome fear^a (Diana)</p>	<p><i>Lack of hierarchy, willing to share power</i> There was no hierarchy, no competition and we worked together^a out of our own interest. There was no compulsion and no necessity to please higher authorities. We were united by our motive, which made our personal differences unnoticeable^b. (Gina)</p>	<p><i>Promoting a sense of self-leadership</i> In the second lesson my attitude changed, I wanted to be more active and give my contribution. I was less afraid of being limited by linguistic weakness because I had focused more on wanting to design in my team. ...If the intention is positive and constructive, it will certainly lead to more results^a. (Emma)</p>
Ethical	<p><i>Self and Others Values</i> Collective inquiry, for me, is a very interesting process. Not only does it present participants with the opportunity to learn from multiple minds but it also generates tremendous scope for meta-thinking^a. ... I mean that one can think about the thinking of self and others, think about the nature of the participants' (including your own) questions, responses, reactions and ideas^a. (Steven)</p>	<p><i>Establishing sense of personal character</i> I basically did not express myself well and relied on someone else who had a very active attitude. Neither did I think about the topic really deeply. But in a small group such as this class, it is easier to express myself aloud, and in addition, I spontaneously think deeply. (Thomas)</p>	<p><i>Being trusting</i> Another significant factor during this experience was the theme of trust in each other [which] allows you to have more motivation in achieving the goal^a. (Emma)</p>

^aCo-shaping

^bCo-sensing

their ideas formed a scaffolding of web-like connections. With their openness to differences and belief that everyone can make a difference, they built rich human connections. The following statement by one of the participants expresses the emphasis on relationships when in collaboration and the students' sense of themselves as one energetic whole.

The other two aspects of collaboration that I identified are energy and relationship building....The group had a positive energy, and as we had continuous discussions our relationships became stronger. ...even though we are from completely different set-ups, we are connected by our ideas. (Gina)

In working collectively towards a common purpose, the team found it essential that they felt aligned to each other. The following quote is a reflection on the sense of co-creation that arose out of the feeling of connectedness within the group and the students' sense that they were able to bring themselves with authenticity to the learning space. It is representative of coalition building, which is fundamental to co-sensing.

I was able to connect better with the persons I was talking to. It comes down to feeling comfortable emotionally with the people I was interacting and feeling in line with myself.... Emotional alignment is crucial when it comes to co-creation. (Audrey)

The practice of encouraging and affirming others adds to an empowering environment for knowledge co-construction, and it aids in building coalitions:

Thinking of 'being encouraging'...the ability to understand when and how to be encouraging; to listen to evaluate if and how to help those in front of you; to be helpful without changing or influencing...aspects that belong to the person. (Samantha)

The students' experiences are representative of web-like thinking and of awareness of the coalitions they were building and supporting with the necessary relational practices. Through co-sensing, they maintained their self-awareness and sustained their alignment with others at a cognitive and emotional level.

The shared and relational practices of co-shaping

The other major shared and relational practice is *co-shaping*, which is realized when individuals operate as a team—as one whole organism—working towards a collective vision. The conceptualizations exploited from Komives' criss-crossing were common purpose, commitment, envisioning, framing and reframing, the promotion of self-leadership and the willingness to share power (Tables 2, 3). The term co-shaping also originates from the Theory U developed by Scharmer (2009), which refers to co-shaping as embodying and institutionalizing the new. The Theory U argues that when we are more fully aware of our interior condition from which our attention and actions originate, we can contribute to situations more effectively, co-shaping a desired future.

Thus, in this article, co-shaping refers to the process by which a team shares a common vision and works as a whole towards its goal of knowledge co-construction, thereby realizing its collective potential. The following quote expresses how a shared goal is fundamental when a team works together. Listening becomes an essential practice that increases the team's ability to operate effectively.

A collaborative team should have a common goal and...motivation at its base... another important aspect is recognizing oneself as a member of the group, so feeling a sense of belonging, no matter if the members do not know each other well. ...to have a climate of listening and respect to make the group work effectively. (Emma)

Framing and reframing is a relational practice that helps the team work as one whole. The quote below shows how students practised framing and reframing when working as a team and remaining conscious of the cognitive shifts necessary to enhance collaboration:

I tend to capture only those ideas that resonate with my train of thought...I will make a conscious effort to stay engaged and focused in the present and to keep my eyes, ears and mind constantly open to others. (Steven)

The team members described how they practised self-leadership to broaden their contributions to the team in working towards the shared goal.

At first...I have [had] almost no idea about what we can handle with the topic. But thanks to the collective inquiry, I listened to many varieties of ideas about it from other colleagues, and I could build something. (Thomas)

During the interactions, the students reciprocally moved between leading and showing willingness to be led. The students perceived power as a shared resource. The following quote reflects upon the aspect of willingness to share power and an ability to see leadership in the collective.

I like juggling between leading and being led and in both cases, value trust, empathy, high expectations, pursuit of excellence, vulnerability and autonomy. ...It could be said that the shared desire to achieve a particular outcome is the foundation of a team. (Steven)

The students' awareness of being committed to a common purpose drove the shared and relational practices of co-shaping. This was further supported as they created spaces of shared responsibility, envisioned a desired future collectively and furthered their capacity for self-leadership.

Enabling co-sensing and co-shaping

The second research question addressed the factors that would enable the creation of co-sensing and co-shaping. The data related to the shared and relational practices of co-sensing and co-shaping revealed two enabling features: a broadening perception of diversity and the perception of barriers as relational possibilities.

A broadening perception of diversity

In their reflections, the students considered diversity as an enabler of shared and relational practices. The practice of being able to sense themselves as one interconnected team (co-sensing) and the shared goal of working towards knowledge co-construction (co-shaping) were enabled by the perception of diversity as an invitation to further relational practices. The students observed themselves as diverse individuals—as a diverse team—and worked towards building coalitions. As diverse people, they shaped and created the context by contributing new meaning to a shared purpose and goal (Caviglia 2010; Komives et al. 2013). Being open to differences and believing that everyone can make a difference are essential to knowledge co-construction, wherein group members collaborate and move relationally through dialogue with each other (McNamee 2012). This required that the students carry themselves in this space of diversity with the willingness to connect to different ideas and establish web-like thinking, broadening their perception of working together. This is expressed in the following quote:

Even when 5 people from different backgrounds, cultures, beliefs and religions collaborate...differences can engage stories and past experiences... I also learned to appreciate different aspects of dialogue and discussion by giving time to lead, listen, question, contrast and reflect, and in turn, all members enhanced inquiry. (Cecilia)

In their interactions, the students invited all voices with an open mind and connected with realities outside their existing mental models. Framing and reframing occurred at an individual level, with the intention to move beyond existing mental maps and past experiences of working in groups. This shared practice allowed co-sensing and co-shaping to emerge and required the students to immerse themselves in the space of uncertainty that normally lies within diverse learning settings, directing the inquiry process towards the shared goal:

In the past I often had the perception that components of a group ended up having perhaps only stress in common. ...Thanks to the work done on the basis of this method I was able to directly experience...effective...true collaboration. (Samantha)

The presence of diversity encourages students to build new perspectives and orientations, leading them to carry out relevant actions and move towards a process of evolving social order with emergent coordination (Uhl-Bien 2006):

One aspect that was both an enabler and a constraint is our diversity. It enables us to widen our horizons of thinking and get exposure, but at the same time, we tried hard to find a common context to move forward. (Gina)

Perceiving barriers as doorways to new relational possibilities

A multicultural student team engaging in collaborative learning interactions also faces barriers due to its diversity. Whenever faced with a barrier, the students relied on shared and relational practices that were inclusive, purposeful, empowering and ethical for a desired course of action. These were fundamental for the emergence of the shared and relational practices of co-sensing and co-shaping. The students perceived barriers to collaboration as doorways to new relational possibilities. For example, they expressed that a lack of fluency in English was a limitation. They felt there were instances when they could not share enough information, limiting their contributions to the shared vision. The solution was to construct shared and relational practices as their learning interactions evolved, with an emphasis on relationships (Crevani et al. 2007; Pearce and Manz 2005; Raelin 2011). The following quote shows how students felt supported and how they supported others in their interactions despite language difficulties:

Communication is a two-way responsibility. ...The listeners have just as much responsibility to try and understand the speaker, such as...[using] the mirroring technique by paraphrasing what the speaker said to make sure he or she understood the message correctly. (Diana)

The fundamental factors enabling co-shaping were the team members' feelings of connection to the realization of the shared goal, their commitment to the process despite barriers and their promotion of a sense of self-leadership:

I was quite critical of myself because I was aware of my language limitations, but I wanted to participate and contribute.... I didn't manage to make myself understood as I would have liked, but inside me it's very strong and clear the desire to collaborate in the realization of this project. (Emma)

In sum, practising the art of listening, being open to differences and practicing web-like thinking helped the students believe each team member could make a difference. Reinforcing relational practices enabled co-sensing and co-shaping. These occurred in the dynamic relations among the students (Hosking 1988), leading them towards more meaningful and purposeful learning interactions. This is evident in the following quote.

There was [an]...atmosphere in which everyone could feel listened to. ...[A] significant factor during this experience was the theme of trust in each other, ...To know that others trust you...allows you to have more motivation in achieving the goal. ...One of the few experiences of my life in which I felt a collaborative atmosphere...(Emma)

Conclusion and discussion

The aim of this research was twofold. First, it sought to examine the shared and relational practices that were co-created in higher education within a socially constructed learning environment by a multicultural student team. The second aim was

to understand the issues that enabled the co-creation of shared and relational practices despite inevitable barriers. The shared and relational practices were studied through the lens of the theory of relational leadership by criss-crossing two models: the relational leadership model and the knowing-being-doing model.

The thematic analysis, conducted deductively, uncovered a range of shared and relational practices that were synthesized by criss-crossing the models onto two major practice themes (Table 3), labeled co-sensing and co-shaping (Scharmer 2009). They appeared essential to the achievement of common purposes in higher education, such as knowledge construction. The shared and relational practices of co-sensing and co-shaping resulted from relational leadership when the student team started to sense itself, over a period of three months, as one whole, interconnected organism working towards a shared goal.

Co-shaping represents the team's ability to operate with relevant actions to realize a shared goal. It comprises the conceptualizations of common purpose, commitment, envisioning, framing and reframing, the promotion of self-leadership and willingness to share power. Co-sensing is a synthesis of web-like thinking, openness to differences, encouragement and affirmation of others, the belief that everyone can make a difference and coalition building. Both practices were the result of the student team feeling connected to the collective aim of knowledge co-construction in collaboration.

The ability to exploit co-shaping and co-sensing was enabled by two major features: a broadening perception of diversity and the perception of barriers as doorways to new relational possibilities. Each of these was enabled by being open to differences, undergoing cognitive shifts through framing and reframing, building coalitions, listening, encouraging others and promoting a sense of self-leadership. For example, research on relational leadership and 'leadership in the plural' (Denis et al. 2012) confirms our results by highlighting the importance of perceiving diverse perspectives and finding collective pathways to lead a team towards a desired goal (Fairhurst and Grant 2010; Kezar et al. 2006). The findings also show that the students observed themselves as a part of a diverse team, embracing alternative world views through co-sensing and co-shaping while recognizing themselves as a single, unified entity. This manifested as an effort to make a cognitive shift to build new experiences of working in groups, particularly enabled by creating relational bridges through dialogue (Cunliffe and Eriksen 2011; Hosking 2011; McNamee 2012). Co-sensing and co-shaping are, therefore, redefined in this study as amalgamations of shared and relational practices inherent to *relational leaders*, which in this case are the students in the team.

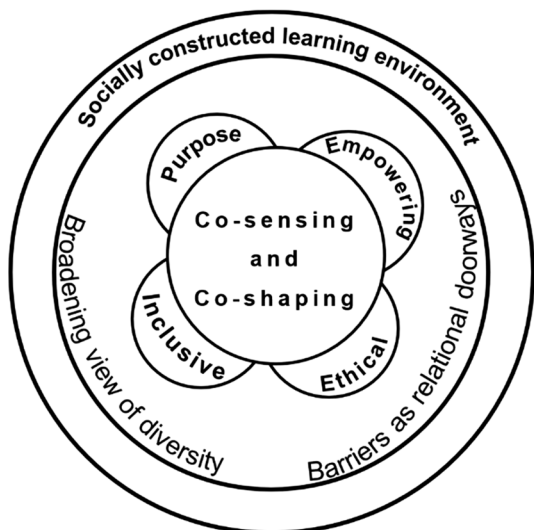
The main findings from this study correspond to four out of six strands of relational leadership as defined by Kezar et al. (2006, p. 69). They argue that (a) relational leadership is a collective and collaborative process; (b) teams are viewed as cultures in which all members are believed to be equal and individual differences are affirmed; (c) relationship building is emphasized; and (d) differences in team settings are believed to advance cognitive complexity. As to research that presents relational leadership as a relational and collaborative process intended to create positive change, this study indicates that special attention should be paid to shared and relational practices that enable the manifestation of relational

leadership in diverse higher education learning environments (Kezar et al. 2006; Komives et al. 2013). These practices enable the formation of relational leaders through socially constructed learning interaction.

These practices are enabled through attempts to build a broadening view of diversity and through the perception of existing barriers as relational doorways (Fig. 2). Moreover, shared and relational practices that are inclusive, empowering, ethical and purposeful provide the essential synergy and momentum for knowledge co-creation. From this, a social order evolves through emerging collaboration and new values, and attitudes and behaviors are produced through students' engagement in true relational leadership (Cunliffe and Eriksen 2011; Dachler and Hosking 1995; Fletcher 2012; Uhl-Bien 2006).

The connection between learning and leadership is an important area of research in higher education and allows us to conceptualize leadership in creative ways (Clair 2020; Dempster 2009; Kezar et al. 2006; Quinlan 2014). Our main findings suggest that the major practices of co-sensing and co-shaping, embedded with many shared and relational practices, provide higher education student teams with effective learning and knowledge construction in a collaborative, socially constructed learning environment. Even though the sample size was limited and the findings of this study cannot be generalized to different higher education contexts, it is important to note that the multicultural student group demonstrated effective shared and relational practices while functioning as relational leaders to lead themselves to their shared goal. Thus, the findings might provide valuable insights into how to foster relational leaders in other higher education contexts. The findings also highlight the expanding mind-set that individual students bring to leadership through shared and relational practices and contradict the idea that leadership is situated only in hierarchies or among students who are presidents of

Fig. 2 Shared and relational practices of relational leadership in a socially constructed learning environment



university organizations. Hence, the findings suggest that leadership and collaborative learning can co-exist in higher education classrooms.

Learning environments that encourage students to take ownership of the learning process are key to sustaining collaboration and leadership. Opportunities for students to set learning goals collectively and in alignment with larger course objectives activate collaboration and leadership. Pedagogical practices should help students to consciously and objectively observe and perceive the presence of diverse perspectives, enabling them to understand how diverse perspectives can co-exist and be used as a resource for furthering knowledge. This, in turn, enables collaboration and relational practices that nurture leadership.

In these times of complex global challenges, we need to focus on building teams that have the ability to make cognitively complex decisions and adapt to multiple worldviews. It is evident that leadership is a collective process that can be found among many different groups of individuals on university campuses. Our findings indicate how a group of students working together became relational leaders and overcame barriers to collaboration through relational practices. This study also adds emphasis to the ways in which learning environments serve as nourishing spaces in the formation of relational leaders who can go on to become future change agents. Finally, the findings provide fresh perspectives for building stronger learning relationships on campuses among multicultural learning communities. In this way, higher education institutions could better prepare their students to be competent, both in their lives and in their work within the global society.

This study had limitations that should be considered. The relatively small sample size of eight students makes it difficult to generalize the findings beyond the scope of the study. Thus, future research could include several teams across more diverse learning settings. Another limitation is that the course was conducted in English, which was a foreign language for some of the students. However, the students used their full proficiency of English to express their reflections and showed themselves to be sufficiently competent in the group discussions. They also used technological tools or peer-support in discussions and when writing their reflections to maintain clarity in expression. In addition, the students' diverse cultural and ethnical backgrounds may have caused some limitations in being able to relate to the contexts of their personal or educational experiences in their home countries. Methodologically, further studies could use richer methods of data gathering and analysis, such as quantitative analysis, diary method or discourse analysis. Follow-up interviews and more structured discussions with the students could also be utilized.

In conclusion, our findings offer implications for further research on how both relational and task-oriented skills could be involved in higher education learning environments and how student teams could maintain attention to fruitful goals and objectives and build stronger relationships (Caviglia 2010; Kezar et al. 2006). As is the case with most studies in leadership that focus on students, students in leadership roles and leadership identity development among university students (Komives 2012; Komives et al. 2009), future research may aim to understand spaces of social interaction in learning settings and the manifestation of shared leadership within those spaces. We need more research on the best practices of student teams and on

how student teams overcome barriers to collaboration to build teams that will act effectively in global society.

Finally, we suggest that higher education should focus more on students as the key actors of relational leadership (i.e. as relational leaders) and thereby help build transformative learning spaces within different kinds of demographic settings. Higher education might choose to focus on training, or on developing and researching tools, techniques and university pedagogies that are inclined towards building shared and relational practices and establishing these practices as key components of the learning culture. Designing courses that are experimental in nature but grounded in research-based theory can help create open, safe learning environments that allow for experiential learning. The use of creative teaching tools and powerful, reflective questioning that assists in directing learning goals, dialogical interactions, assessment and feedback are essential ingredients to learning. Creating learning spaces that acknowledge diversity as a resource and as a scaffolding for integrating varied perspectives can lead students towards building stronger, more empowering learning relationships.

Acknowledgements We would like to thank all the participants of the study and the technical support received from the Faculty of Education and Psychology at the University of Jyväskylä.

Author contributions Conceptualization: BR; Methodology: BR, AJ and MT; Formal analysis and investigation: BR; Writing—original draft preparation: BR; Writing—review and editing: AJ and MT; Supervision: AJ and MT.

Funding Open access funding provided by University of Jyväskylä (JYU).

Data availability The datasets generated during and analyzed during the current study are not publicly available (as they may contain information that could compromise the privacy of the research participants), but are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

Accessed 22 Feb 2021

- Ahn R, Class M (2011) Student-centered pedagogy: co-construction of knowledge through student-generated midterm exams. *Int J Teach Learn High Educ* 23:269–281
- Al-Khalifa HS (2017, July 10–12) Applying the Marshmallow Challenge in a research methods course: lessons learned. In: 16th International conference on information technology based higher education and training [Conference Presentation]. <https://doi.org/10.1109/ITHET.2017.8067793>
- Anthony S (2014) Innovation leadership lessons from the marshmallow challenge. *Harv Bus Rev*. <https://hbr.org/2014/12/innovation-leadership-lessons-from-the-marshmallow-challenge>
- Auvinen T, Aaltio I, Blomqvist K (2013) Constructing leadership by storytelling – the meaning of trust and narratives. *Leadersh Organ Dev J* 34:496–514. <https://doi.org/10.1108/LODJ-10-2011-0102>
- Barge JK, Fairhurst GT (2008) Living leadership: a systemic constructionist approach. *Leadership* 4:227–251. <https://doi.org/10.1177/1742715008092360>
- Biddix JP (2010) Relational leadership and technology: a study of activist college women leaders. *Naspa J Women High Educ* 3:28–51. <https://doi.org/10.2202/1940-7890.1043>
- Boje DM, Rosile GA, Saylor J, Saylor R (2015) Using storytelling theatrics for leadership training. *Adv Dev Hum Resour* 17:348–362. <https://doi.org/10.1177/1523422315587899>
- Branson CM, Franken M, Penney D (2016) Middle leadership in higher education: a relational analysis. *Educ Manag Adm Leadersh* 44:128–145. <https://doi.org/10.1177/1741143214558575>
- Braun V, Clarke V (2006) Using thematic analysis in psychology. *Qual Res Psychol* 3:77–101
- Bright DS, Cooperrider DL, Galloway WB (2006) Appreciative inquiry in the office of research and development: improving the collaborative capacity of organization. *Public Perform Manag Rev* 29:285–306. <https://doi.org/10.2753/pmr1530-9576290303>
- Caviglia EA (2010) Relational leadership: underrepresented student perspectives on diversity courses [Doctoral dissertation]. Retrieved from ProQuest Central, Social Science Premium Collection. (750445012). Accessed 30th May 2020
- Ciulla JB (1998) Leadership ethics: mapping the territory. In: Ciulla J (ed) *Ethics: the heart of leadership*. Praeger, Westport CT, pp 3–25
- Clair RS (2020) *Learning-centred leadership in higher education: sustainable approaches to the challenges and responsibilities*. Springer Nature, Switzerland AG
- Collinson M (2018) What's new about leadership-as-practice? *Leadership* 14(3):363–370. <https://doi.org/10.1177/1742715017726879>
- Crevani L, Lindgren M, Packendorff J (2007) Shared leadership: a post-heroic perspective on leadership as a collective construction. *Int J Leadersh Stud* 3:40–67
- Crevani L, Lindgren M, Packendorff J (2010) Leadership, not leaders: on the study of leadership as practices and interactions. *Scand J Manag* 26:77–86. <https://doi.org/10.1016/j.scaman.2009.12.003>
- Cunliffe AL, Eriksen M (2011) Relational leadership. *Hum Relat* 64:1425–1449. <https://doi.org/10.1177/0018726711418388>
- Dachler HP, Hosking DM (1995) The primacy of relations in socially constructing organizational realities. In: Hosking DM, Dachler HP, Gergen KJ (eds) *Management and organization: relational alternatives to individualism*. Avebury, Aldershot, pp 1–29
- Damşa C, Ludvigsen S, Andriessen J (2013) Knowledge co-construction - epistemic consensus or relational assent? In: Baker M, Andriessen J, Jaarvela S (eds) *Affective learning together: social and emotional dimensions of collaborative learning*. Routledge, London, pp 97–119
- Dempster N (2009) Leadership for learning: a framework synthesising recent research, EdVentures, The Australian College of Educators. Griffith University. https://research-repository.griffith.edu.au/bitstream/handle/10072/28012/57815_1.pdf?sequence=1. Accessed 2 Sept 2020
- Denis JL, Langley A, Sergi V (2012) Leadership in the plural. *Acad Manag Ann* 6:211–283. <https://doi.org/10.1080/19416520.2012.667612>
- Drath WH (2001) *The deep blue sea: rethinking the source of leadership*. Jossey Bass, San Francisco
- Drath WH, McCauley CD, Palus CJ, Van Velsor E, O'Connor PMG, McGuire JB (2008) Direction, alignment, commitment: toward a more integrative ontology of leadership. *Leadersh Q* 19:635–653. <https://doi.org/10.1016/j.leaqua.2008.09.003>

- Dugan JP, Komives SR (2010) Influences on college students' capacities for socially responsible leadership. *J Coll Stud Dev* 51:525–549. <https://doi.org/10.1353/csd.2010.0009>
- Edwards A (2005a) Let's get beyond community and practice: the many meanings of learning by participating. *Curric J* 16:49–65. <https://doi.org/10.1080/0958517042000336809>
- Edwards A (2005b) Relational agency: learning to be a resourceful practitioner. *Int J Educ Res* 43:168–182. <https://doi.org/10.1016/j.ijer.2006.06.010>
- Edwards A (2011) Building common knowledge at the boundaries between professional practices: relational agency and relational expertise in systems of distributed expertise. *Int J Educ Res* 50:33–39. <https://doi.org/10.1016/j.ijer.2011.04.007>
- Edwards A (2012) The role of common knowledge in achieving collaboration across practices. *Learn Cult Soc Interact* 1:22–32. <https://doi.org/10.1016/j.lcsi.2012.03.003>
- Endres S, Weibler J (2017) Towards a three-component model of relational social constructionist leadership: a systematic review and critical interpretive synthesis. *Int J Manag Rev* 19:214–236. <https://doi.org/10.1111/ijmr.12095>
- Fairhurst GT, Grant D (2010) The social construction of leadership: a sailing guide. *Manag Commun Q* 24:171–210. <https://doi.org/10.1177/0893318909359697>
- Fairhurst GT, Uhl-Bien M (2012) Organizational discourse analysis (ODA): examining leadership as a relational process. *Leadersh Q* 23:1043–1062. <https://doi.org/10.1016/j.leaqua.2012.10.005>
- Fletcher JK (2012) The relational practice of leadership. In: Uhl-Bien M, Ospina Sonia M (eds) *Advancing relational leadership research: a dialogue among perspectives*. Information age, Charlotte, pp 83–106
- Fletcher J, Kaufer K (2003) Shared leadership: paradox and possibility. In: Pearce CL, Conger JA (eds) *Shared leadership reframing the hows and whys of leadership*. Sage publications, Thousand Oaks, pp 21–47
- Gewerc A, Montero L, Lama M (2014) Collaboration and social networking in higher education. *Comunicar* 21:55–63. <https://doi.org/10.3916/C42-2014-05>
- Greeno J (2006) Learning in activity. In: Sawyer K (ed) *The Cambridge handbook of the learning sciences*. Cambridge University Press, New York, pp 79–96
- Heo H, Lim KY, Kim Y (2010) Exploratory study on the patterns of online interaction and knowledge co-construction in project-based learning. *Comput Educ* 55:1383–1392. <https://doi.org/10.1016/j.compedu.2010.06.012>
- Hilliard AT (2010) Student leadership at the university. *J Coll Teach Learn (TLC)*. <https://doi.org/10.19030/tlc.v7i2.93>
- Hong HY, Sullivan FR (2009) Towards an idea-centered, principle-based design approach to support learning as knowledge creation. *Educ Technol Res Dev* 57:613–627. <https://doi.org/10.1007/s11423-009-9122-0>
- Hosking DM (1988) Organizing, leadership and skilful process. *J Manag Stud* 25:147–166. <https://doi.org/10.1111/j.1467-6486.1988.tb00029.x>
- Hosking DM (2011) Telling tales of relations: appreciating relational constructionism. *Organ Stud* 32:47–65. <https://doi.org/10.1177/0170840610394296>
- Järvelä S, Järvenoja H (2011) Socially constructed self-regulated learning and motivation regulation in collaborative learning groups. *Teach Coll Rec* 113:350–374
- Kezar AJ, Carducci R, Contreras-McGavin M (2006) Rethinking the “L” word in higher education: the revolution in research on leadership. ASHE Higher Education Report, Vol. 31, No. 6. Jossey-Bass, San Francisco
- Kocolowski MD (2010) Shared leadership: is it time for a change. *Emerg Leadersh Journeys* 3:22–32
- Komives SR (2012) College student leadership identity development. In: Murphy SE, Reichard RJ (eds) *Early development and leadership: building the next generation of leaders*. Routledge Psychology Press, New York, pp 273–292
- Komives SR, Longbeam SD, Owen JE, Mainella FC, Osteen L (2006) A leadership identity development model: applications from a grounded theory. *J Coll Stud Dev* 47:401–418. <https://doi.org/10.1353/csd.2006.0048>
- Komives SR, Longbeam SD, Mainella F, Osteen L, Owen JE, Wagner W (2009) Leadership identity development. *J Leadersh Educ* 8:11–47. <https://doi.org/10.12806/V8/I1/TF2>
- Komives SR, Lucas N, McMahon TR (2013) *Exploring leadership: for college students who want to make a difference*, 3rd edn. Wiley, San Francisco
- Lai KW (2015) Knowledge construction in online learning communities: a case study of a doctoral course. *Stud High Educ* 40:561–579. <https://doi.org/10.1080/03075079.2013.831402>

- Lambert L (2002) A framework for shared leadership. *Educ Leadersh* 59:37–40
- Marzouki OF, Idrissi MK, Bennani S (2017) Effects of social constructivist mobile learning environments on knowledge acquisition: a meta-analysis. *Int J Interact Mob Technol* 11:18–39. <https://doi.org/10.3991/ijim.v11i1.5982>
- McNamee S (2012) From social construction to relational construction: practices from the edge. *Psychol Stud* 57:150–156. <https://doi.org/10.1007/s12646-011-0125-7>
- Mentkowski M & Associates (2000) *Learning that lasts: integrating learning, development and performance in college and beyond*. Jossey-Bass, San Francisco
- Orr K, Bennett M (2017) Relational leadership, storytelling, and narratives: practices of local government chief executives. *Public Adm Rev* 77:515–527. <https://doi.org/10.1111/puar.12680>
- Pearce CL, Manz CC (2005) The new silver bullets of leadership: the importance of self- and shared leadership in knowledge work. *Organ Dyn* 34:130–140. <https://doi.org/10.1016/j.orgdyn.2005.03.003>
- Prawat RS, Floden RE (1994) Philosophical perspectives on constructivist views of learning. *Educ Psychol* 29:37–48. https://doi.org/10.1207/s15326985ep2901_4
- Puntambekar S (2006) Analyzing collaborative interactions: divergence, shared understanding and construction of knowledge. *Comput Educ* 47:332–351. <https://doi.org/10.1016/j.compedu.2004.10.012>
- Quinlan KM (2014) Leadership of teaching for student learning in higher education: what is needed? *High Educ Res Dev* 33:32–45. <https://doi.org/10.1080/07294360.2013.864609>
- Raelin J (2011) From leadership-as-practice to leaderful practice. *Leadership* 7:195–211. <https://doi.org/10.1177/1742715010394808>
- Raelin JA (2014) Imagine there are no leaders: reframing leadership as collaborative agency. *Leadership* 12:131–158. <https://doi.org/10.1177/1742715014558076>
- Scardamalia M, Bereiter C (1994) Computer support for knowledge-building communities. *J Learn Sci* 3:265–283. https://doi.org/10.1207/s15327809jls0303_3
- Scharmer CO (2009) *Theory U: learning from the future as it emerges*. Berrett-Koehler Publishers, San Francisco
- Shertzer JE, Schuh JH (2004) College student perceptions of leadership: empowering and constraining beliefs. *Naspa J* 42:111–131. <https://doi.org/10.2202/0027-6014.1417>
- Sim JH (2019) Exploring the relational leadership potential of appreciative inquiry: a case study. *South Asian J Bus Manag Cases* 8:47–57. <https://doi.org/10.1177/22779797918803217>
- Snook S, Nohria N, Khurana R (2012) *The handbook for teaching leadership: knowing, doing, and being*. Sage, Thousand Oaks
- Spillane JP (2005) Distributed leadership. *Educ Forum* 69:143–150. <https://doi.org/10.1080/00131720508984678>
- Suzuki N, Shoda H, Sakata M, Inada K (2016) Essential tips for successful collaboration—a case study of the “Marshmallow Challenge.” In: Yamamoto S (ed) *Human interface and the management of information: applications and services*. HIMI 2016. Lecture Notes in Computer Science. Springer, Cham, pp 81–89
- Uhl-Bien M (2006) Relational leadership theory: exploring the social processes of leadership and organizing. *Leadersh Q* 17:654–676. <https://doi.org/10.1016/j.leaqua.2006.10.007>
- Valsiner J (1994) Culture and human development: a co-constructionist perspective. In: Van Geert P, Mos LP, Baker WJ (eds) *Annals of theoretical psychology*. Springer, Boston, pp 247–298
- Van den Bossche P, Gijsselaers WH, Segers M, Kirschner PA (2006) Social and cognitive factors driving teamwork in collaborative learning environments: team learning beliefs and behaviors. *Small Group Res* 37:490–521. <https://doi.org/10.1177/1046496406292938>
- Van Schalkwyk GJ, D’Amato RC (2015) *Facilitative collaborative knowledge co-construction: new directions for teaching and learning*, Number 143. Wiley, San Francisco
- Von Glasersfeld E (1995) A constructivist approach to teaching. In: Steffe LP, Gale J (eds) *Constructivism in education*. Lawrence Erlbaum, New Jersey, pp 3–15
- Wilkinson SC (2011) Using socially constructed technology to enhance learning in higher education. *J Learn Dev High Educ* 3. <http://www.uh.cu/static/documents/RDA/Using%20socially%20constructed%20technology.pdf>. Accessed 7 Sept 2020
- Zheng B, Niiya M, Warschauer M (2015) Wikis and collaborative learning in higher education. *Technol Pedagog Educ* 24:357–374. <https://doi.org/10.1080/1475939X.2014.948041>