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Challenge-Based Learning in Higher Education:
A Malmö University Position Paper

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ABSTRACT

Higher education institutions (HEIs) have a pivotal role in fulfilling the social dimension of sustainability and contributing to a complex changing society. To meet these challenges, Malmö University has in interdisciplinary groups researched the role of challenge-based learning (CBL) in relation to staff, students, disciplines, and stakeholders. This position paper is based on that work. Malmö University argues that with a CBL approach, HEIs will actively contribute to the building of a sustainable learning society through collaboration in education, research, and innovation. This paper theoretically explores the CBL approach as a collaborative learning exchange within HEIs and society at large. CBL is defined through eight key elements, clustered as entities of three domains: diversity and inclusion, co-creation and collaboration, and change agents and contextual challenges. These are discussed and empirically exemplified with the purpose to support designing, planning, and accomplishing CBL in teaching and learning in HE for a global learning society.

KEYWORDS

Adult Learning, CBL, Challenge-Based Learning, Change Agents, Co-Creation, Diversity, Higher Education, Inclusion, Learning and Teaching, Learning Society, Position Paper, Student Active Learning, Transformation

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INTRODUCTION

With this position paper, Malmö University wants to argue for a comprehensive approach to how higher education institutions (HEIs) can transform adult learning in higher education (HE) together with the society at large and thereby contributing to the development of a global learning society. We will, thus, present an inclusive institutional narrative on our development of Challenge Based Learning (CBL) grounded in learning theories, innovation integrated into research, and educational technologies, all in collaboration with local and global societal partners (Christensen et al., 2021; Leijon et al., 2021).

The design of the position paper starts with an introductory section, where a background to CBL and its importance in HE is given, followed by a theoretical discussion framing the concept of CBL and ending with a definition and a model of CBL in HE, which are based on Malmö University's theoretical and practical work with CBL. In the section "The Domains of CBL Explained and Exemplified," each of the model's three domains is discussed theoretically based on practical examples. The position paper is summarized in the final section, and conclusions are drawn for future work on CBL in HE.

Why Challenge Based Learning is Needed in Higher Education

During the last decades, the role of HEIs has been shifting towards universities wanting a larger role as responsible drivers of societal and educational change. This shift is, for example, illustrated by the commitment to global frameworks such as the Agenda 2030 and the 21st Century Skills (Ananiadou & Claro, 2009) and HEIs role in meeting a fast-changing labour market demanding active, creative employees ready to re-skill and re-learn. Furthermore, as societies worldwide face the challenges of rapid global political, social, economic, health, and technological changes (Gwangwava, 2021; Rosa, 2013), HEIs must act responsibly and proactively to secure a readiness to meet the uncertain, unknown futures (Bornemark, 2018).

The concept of a *learning society* (Schön, 1973) captures a sense of urgency and points to the need for HEIs to learn and adapt to a complex, fast-paced changing society and continuous education through lifelong learning. Thus, to meet the needs of a society in continuous transformation, HEIs must invent and develop as "learning systems" capable of bringing about their own continuing transformation (Schön, 1973, p. 28). We argue that the concept of CBL is a most relevant example of how education, research, and innovation can play a decisive part and contribute to a multitude of dimensions for sustainable cities and societies.

Against this backdrop, Malmö University, a young and socially involved university, is engaged in the discussions on what role HEIs will play in the knowledge transformation of society. We argue that the social mission of universities requires transparency and extensive collaboration when interlinking education, research, and innovation in society and to provide a roadmap for lifelong learners. Furthermore, Malmö University appreciates students as social change agents and drivers for change to contribute to a global sustainable learning society. Consequently, Malmö University prioritises aligning theories, methods, and practices to provide learning experiences and generate a grounded readiness to act when meeting unknown future challenges (Bornemark, 2020; Christensen et al., 2021; Edwards, 1997).

Malmö University is in the challenging process of re-designing adult learning in HE through CBL, emphasising contributions to a global learning society and to fulfilling the UN sustainable development goals, particularly the connection between (G4) Education for All; (G11) Sustainable Cities and Communities; (G16) Peace, Justice, and Strong Institutions; and, (G17) Peaceful and Sustainable Societies. In this position paper, Malmö University addresses and theorises CBL as collaborative learning exchanges within HEIs and between HEIs and society. We explore the role and the relation between staff, students, and stakeholders, and indeed between different disciplines and cross-disciplinary education, research, and innovation.

Apple framed the concept of CBL in 2008 (Nichols, 2016) as a direct call to a fresh approach to teaching and learning that would meet a new digital generation of school pupils and prepare them for their future, digitized labour market. Educational technology is crucial and inevitable for the development of CBL. Nonetheless, learning methodologies often described as "challenge-based" is not entirely new to HEIs. A recently published systematic review on research in CBL in HE demonstrates that CBL primarily has been applied as instructional teaching and that disciplinary applications have been the principal focus of the HE context (Leijon et al., 2021). Most articles on CBL have maintained a descriptive level with no or limited critical theoretical discussion of CBL. Primarily, the articles have an Engineering or Educational focus and use disciplinary frameworks for instructional purposes. However, few articles emphasise interdisciplinary research and education or societal impact. Furthermore, a limited understanding of CBL as a method is expressed, and there is little discussion of learning and research approaches that would contribute to this growing field of knowledge. This position paper builds on the systematic review results and suggests practices to further develop and improve HE through CBL. These practice suggestions are based on integrating CBL in education, research, and societal innovation practices across departments and institutions, based on theories of knowledge and learning. In the following sections, we will elaborate on this.

Embarking on the Journey Towards a Learning Society

Malmö University emphasises that learning makes us human, and, therefore, it is a foundational component of the essence of who we are. We base our CBL approach on selected learning theories (see Table 1), independent of disciplines and grounded in holistic HE learning.

By engaging people who have traditionally lacked HE access, their previous experience and knowledge are cultivated as valuable learning resources. This engagement sets the arena for inclusive education and the co-creation of knowledge, originating from the values and experiences everyone brings to the learning environment (Freire, 1973; Christensen et al., 2021). Furthermore, in a global and rapidly changing society, the need for philosophical and ethical reflection and action is essential (Bornemark, 2018; Rosa, 2013; Watson, 2018). We can accomplish this reflection by looking at education through the eyes of *critical pedagogy* (Fleming, 2021; Freire, 1973; hooks, 2003; 2010; Rincon-Gallardo, 2019), which designates HEIs to be open spaces for all students, including vulnerable and under-representative student groups, where they can explore on how to act and assert themselves as agents. Critical pedagogy then becomes an approach to education that addresses the symmetrical relationship between staff, students, and stakeholders and aims to transform oppressive structures.

More than ever, John Dewey's (1916) interpretation – that if we teach today's students the way we taught yesterday's, we rob them of tomorrow – is relevant to how we commit to staging learning in HE. We argue that CBL is a way to prepare and prepare students to face and act upon the societal challenges, e.g., to develop creative and critical thinking and doing by engaging in real-life problems in collaboration with others within or outside HE throughout the education programs. However, integrating research and education into socially innovative and transformative processes is a challenge for the global HE community of today.

The notion of CBL is further supported by Schön's (1973) notions of The Reflective Practitioner, reflection-on-action, and reflection-in-action (double-loop learning), which elaborates on how professionals cope with change and the challenges of their work together with a practice-based intuition and an overall decision process. This model of reflection and action (see also Schön & Argyris, 1976) is applied in a quality framework for many of Malmö University's programs supporting how to implement change on both the individual and system levels.

Furthermore, CBL is closely connected to a transformative learning theory or *transformation theory.* How we interpret our experiences, our being in the world, and how we understand ourselves in relation to the complexity of our world is, therefore, framed in assumptions and references of transformative learning (Mezirow, 2000, pp.3-33; Fleming, 2021). According to Dirkx (2006),

transformative learning entails meaning-making practices within adult education, promoting a democratic vision of society and self-actualisation of individuals. Today, John Dewey's well-known quotation, "Education is not preparation for life; education is life itself" (Dewey, 1916, p. 239), is more apt than ever. In recent decades, HE has mainly focused on the cognitive domain of Bloom's taxonomy (Armstrong, 2010). With CBL, we include the affective, psychomotor domains, and non-cognitive and creative skills (Bamford, 2006; Heckman et al., 2006; Simpson, 1972). We furthermore include Fink's taxonomy (2013) for significant learning outcomes, which organises learning in more than cognitive complexities. We argue that learning requires authenticity, a committed focus on the here and now, and awareness of feelings and emotions, both within the learners and in the learning environment.

Nussbaum (1997) advocated that HE's purpose is to cultivate the entire person to function as a citizen and in life. Furthermore, Nussbaum emphasises the social dimension of HE by the statement that "our campuses are producing Citizens, and this means that we must ask what a good citizen of the present day should be and should know" (Nussbaum, 1997, p. 8). In today's changing world, it is also relevant for HE to ask what a good citizen of *the future is* and what competencies they need to navigate the future challenges. In doing so, HEIs become *civic universities* characterised by the ability to integrate teaching, research, and engagement in society, in such a way that each enhances the other without diminishing the quality of learning (Goddard, 2009). We developed our contribution to the idea of a civic university in our approach to CBL, which is fundamental to building a learning society.

Exploring and Evolving Challenge Based Learning

Malmö University has, since its start in 1998, across the five interdisciplinary faculties, in collaboration with society at large, explored and elaborated different pedagogical and interdisciplinary approaches (summarised in Table 1). Common features that stand out are: student's learning is in focus, learning processes involve close collaboration with a variety of societal partners, and that traditional roles of lecturers, students, staff, are challenged and negotiated. To address this institutional approach, Malmö University has integrated research and education into adult learning in HE in a Centre for Teaching and Learning. The student active learning methods (Table 1) are a common denominator for the university, advanced by the Centre, and vital for developing the CBL approach at Malmö University.

Among all the approaches mentioned above, the pioneering transformation to Problem Based Learning (PBL) at the Faculty of Odontology, which took place in 1990[1] (Rohlin et al., 1998), is specifically worth highlighting. It is an excellent example of a learning approach becoming a change-making paradigm for HE. With its point of departure in the notion of "the learning society," the Faculty of Odontology emphasised the rapid change of science, technology, and social and health development, where updated science, education, and human competencies are interwoven to handle change and the unknown future. In 2019, the Faculty of Odontology undertook a substantial revision of the pedagogic model (Lundegren et al., 2021) and developed a combination of challenge- and case-based learning methods. The intention was to enable a more flexible adaption of learning methods to learning outcomes.

Malmö University has further extended PBL and the broad representation of established student-centered methodologies (Table 1). However, as PBL is resource-demanding, instrumental, and in a way, an overly structured approach, Malmö University has appropriated seeing students as active learners and as partners in the collaborative and transformative learning processes into a more approachable and flexible general learning approach – CBL (Christersson & Staaf, 2021). Inspired by the paradigm process at the Faculty of Odontology, Malmö University initiated a long internal process whereby members of staff from different disciplines met regularly over a nearly decade to workshop, discuss, develop, and research the CBL approach. They identified the following key elements through the process, and Malmö University argues that the CBL approach encompasses *all* these key elements:

- To advance the role of higher education institutions in society;

Table 1. Student active learning approaches at Malmö University

Student Active Learning Methods	
Action Based Learning (ABL)	A process that involves a small group working on real-life problems, taking *action*, and learning as individuals, as a team, and as an organization. It helps people in organisations to develop creative, flexible, and successful strategies for pressing problems.
Case Method	Utilises collaborative learning through realistic cases, putting the students in the role of someone faced with a difficult decision. This method stimulates the integration of learning, self- and critical-reflection, and problem-solving. The case method is highly structured, and teachers play an active role.
Design for Learning (DFL)	A way of thinking about teaching and *learning* in innovative ways helps give all students an equal opportunity to succeed. This approach offers flexibility in how students access material, engage with it, and show what they know. This is a creative learning process similar to the design process.
Entrepreneurial Learning	A structured learning process entails reflective feedback within an actor-network of mentors for the learner to initiate and develop strategies. The aim is to build resilient networks of organisations, businesses, and individuals, driven by entrepreneurial learning competencies of curiosity, creativity, and innovation.
Interprofessional Learning (IPL)	Peer learning involving various professions promotes professional identity and understanding of other professions for the benefit of a third party. Interprofessional learning and teaching can occur at an academic institution and regularly occur in real workplace environments where students gain relevant and practical experience.
Inquiry Based Learning (IBL)	The learner formulates questions and problems and suggests a research approach to present and argue for solutions. Facilitators guide in an open learning process. IBL is mostly used at the master's or doctoral level.
Problem Based Learning (PBL)	Both an approach and a method for students' active learning and lifelong learning using relevant authentic problems in interdisciplinary environments. Teachers are more facilitators of the learning process. Students are co-learners in a designed process of inquiry similar to the research process. Self-directed learning is combined with collaborative learning to enhance deep learning. Feedback is essential both in learning and assessment.
Project Based Learning	A teaching method in which students gain knowledge and skills by working for an extended period to investigate and respond to an authentic, engaging, and complex but specific question, problem, or challenge.
Transformative Learning	The expansion of consciousness through the transformation of basic worldview and specific capacities of the self. Transformative learning is facilitated through consciously directed processes such as appreciatively accessing and receiving the symbolic contents of the unconscious and critically analysing underlying premises.

- To take a stand from theories of lifelong learning in addition to theories of knowledge;
- To actively integrate interdisciplinary research, education, and innovation in HE;
- To acknowledge and build on scholars' and students' individual experiences, background, and identity;
- To include collaborative and pedagogical methodologies for student-centred learning;
- To apply real-world challenges to initiate learning processes;
- To include national and international cooperation with a variety of societal partners; and
- To promote the impact of change toward a learning society.

Primarily these eight elements were identified as keys to CBL in HE and provide a foundation for the Malmö University *Model of Challenge Based Learning in Higher Education* (Figure 1). The

elements were integrated and three domains were developed to support the designing, planning, and accomplishing of CBL in teaching and learning in HE programmes and courses. The domains are *Diversity & Inclusion, Co-creation & Collaboration, and Change Agents & Contextual Challenges* and are interwoven with learning theories, educational technology, research, and innovation from a global perspective. The Malmö CBL approach is visualised in a model, presented in Figure 1 and discussed below.

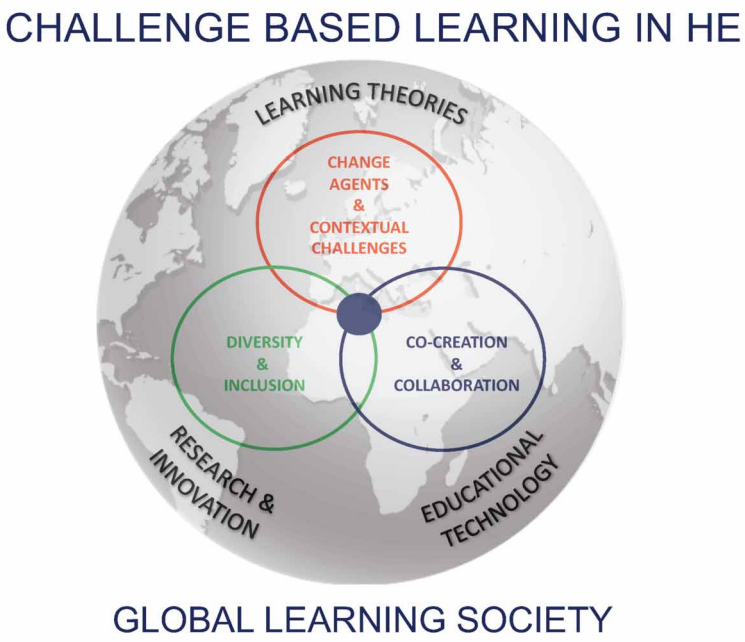
THE DOMAINS OF CBL EXPLAINED AND EXEMPLIFIED

In this section, the three domains are described with selected examples provided by each of Malmö University's five interdisciplinary faculties: The Faculty of Culture and Society, The Faculty of Education and Society, The Faculty of Health and Society, The Faculty of Technology and Society and the Faculty of Odontology.

Diversity and Inclusion

Diversity, inclusion, and widening participation in education have been essential for Malmö University since 1998 and fundamental conditions to enable everyone in society to make their voice heard and exert influence in society. Furthermore, addressing complex societal challenges demands a diversity of perspectives and approaches, which is achieved by integrating various disciplines and actively embracing different backgrounds and experiences of students and staff. Diversity needs, however, to be accompanied by active inclusion to generate a trustful, creative, and inspiring academic environment, which drives diversity as a quality dimension in education, research, and society (Florida, 2002; European Commission, 2014). We argue that diversity and inclusion should underpin all aspects of HEIs, from admission and introduction, curriculum- and learning design, to lecturers' professional development and research, learning- and research environments, assessment practices, and collaboration with stakeholders.

Figure 1. Model of challenge based learning in higher education



Malmö University emphasises students', lecturers', and stakeholders' individual identities, backgrounds, and experiences, as essential to ensure quality in HE and research. A more inclusive academia also enables students to prepare for a future position as critical global citizens in a sustainable society (Nussbaum, 1997; hooks, 2010).

Malmö University is intentionally working on strategies to ensure a diverse student population, a richness in the staff body, and an open and supporting global working culture (hooks, 2003). We mean an HEI based on CBL attracts and includes diverse groups of students and staff, stimulates non-hierarchical innovative ways of learning, and facilitates inclusive learning environments with societal stakeholders.

Accordingly, Malmö University has created a diverse interdisciplinary forum for scholars to research CBL to support a deeper and broader understanding of learning processes and the transformation of HE to strengthen a democratic society (Freire, 1973; Rincon-Gallardo, 2019). Furthermore, Malmö University enables and encourages interdisciplinary research groups of scholars representing diverse disciplines and faculties.

Thus, Malmö University promotes an inclusive, diverse interdisciplinary, and collaborative approach through CBL.

Examples of Diversity and Inclusion in Practice: Vertically Integrated Projects and Scenario Based Projects

To illustrate the above, Malmö University wants to share two pertinent examples of *Diversity and Inclusion. The Vertically Integrated Projects program (VIP)* (Coyle, 2006) in Computer Science, Strategic Business, and Game Development is a research-led model for engaging diverse and inclusive teams of students at Bachelor, Master, and Ph.D. levels. These interdisciplinary teams are involved in collaborative and inclusive learning processes through existing research projects, through long-term, large-scale, and international learning projects. The objective is to create inclusive forums where diverse students, staff, and stakeholders learn from and with each other, e.g., professional challenges and languages. Within these forums, they develop common professional knowledge, practices, and skills and position both students and teachers as lifelong learning subjects. These projects strengthen students' connections to their future career paths and provides direct academic research experience. The VIP model entails double-loop learning: participating in inclusive and diverse collaborative research projects leads to new research questions and new research collaborations.

The Police Education at Malmö University is working with authentic scenario-based learning. This approach embraces diversity, inclusive and cultural training as a central element, and the police organisation's authentic scenarios of vulnerability in specific conflict situations. The aim is to enable police students to be ready to meet unknown situations by testing different strategies for managing diverse and intercultural scenarios. Students need to face challenging situations, meet multi-cultural environments, learn many strategies, develop practices, and make quick decisions, thus integrating psychological and socio-emotional effects and consequences. For example, police students drive a police car into "no-go" areas, where they meet threatening citizens (actors) of different cultural and ethnical backgrounds in risky situations. These CBL-driven scenarios are grounded in Biesta's (2014) notions; *socialisation* (students are trained to handle a diversity of power and norms inclusively), *subjectification* (students are trained to sort out their understanding and practices among the collective's diverse suggestions and ideas), and *qualification* (for example training to handle culturally difficult situations). Students are challenged to manage power, roles of authority, behavioural norms, and realise strategies in various conflicts of exclusion, explicit power structures, and symbolic and physical violence. Students are further challenged to explore and co-create (between Swedish Police Authority officers, lecturers, and students) strategies and practices of inclusion in these authentic police scenarios in which intercultural, juridical, and ethical dilemmas are embedded. This professional training instigates reflection on action and reflection in action and follows in the footsteps of a double-loop learning process (Schön & Argyris, 1976).

Co-Creation and Collaboration

Malmö University argues for co-creation and collaboration as success factors for solution-oriented learning approaches, which equip students to tackle complex societal challenges. We aim to facilitate co-creative processes in research-integrated education, where praxis and theory are incorporated from interdisciplinary to transdisciplinary research methods and theories of learning. It also promotes a practice-based intervention approach (Löwgren & Reimer, 2014). Malmö University defines transdisciplinary research as a reflexive, integrative, and method-driven scientific principle focusing on societally relevant problems, enabling mutual learning processes among researchers from different disciplines and scientific traditions. Transdisciplinary research should create knowledge useful to both the scientific and societal practices and sustainable development in education (Lang et al., 2012; Warburton, 2003). Malmö University argues that HEIs, scholars, and stakeholders must integrate multiple perspectives to identify and solve future challenges.

In the co-creation of knowledge, teachers, students, and stakeholders work together to develop and sharpen their capacity to analyse, synthesise, evaluate, and develop course content, and use their collective knowledge to construct shared meaning and make sense of what they learn. Co-designed structures involve integrating applied research and education in close collaboration with societal actors, where students act as change agents identifying and proposing improvements. Therefore, collaboration and co-creation of knowledge within the university should occur across borders of faculties and subjects in research and education, for example, in transdisciplinary programs (Brink et al., 2018; Christensen et al., 2021; Svenningsson et al., 2021).

This shift, however, cannot be undertaken solely within a university (hooks, 2003). Therefore, Malmö University invites various societal partners to participate in this emerging learning community, often facilitated through digital technology. Citizens, representatives of civil society and professions, play a crucial role in challenging suggested solutions, theories, and praxis. Inclusive collaboration across borders is a prerequisite for a co-creative knowledge process that is solution-oriented, socially robust, and transferable to both scientific and societal global practices (cf. Gibbons, 1999). This engagement is needed in a complex and fast-changing society (Rosa, 2013). Malmö University embraces long-term collaboration to accomplish participatory research and learning. This community-based learning approach will strengthen students' capacity to develop ethical awareness and become future critical thinking and acting citizens. Collaborative efforts in knowledge acquisition between staff, students, and stakeholders will increase legitimacy, ownership, and accountability of the challenge and facilitate different solution options (Lang, 2012).

In conclusion, the CBL dimension of Co-creation and Collaboration, enables shared ownership and production of knowledge and a foundation for transforming theory into practice through participatory research and education integrated research projects.

Examples of Co-Creation and Collaboration in Practice: Meeting Societal Challenges in Partnership

Co-creation and Collaboration are exemplified by three programmes co-designed in close cooperation with societal stakeholders from respective professional fields: Sport Science, Media and Communication Studies, and Dental Education. All three bachelor programmes share the pedagogic idea of students, in collaboration with relevant stakeholders, co-construct new theoretical and practical knowledge in the progression of contemporary and future society, and methods of achieving this learning (Svenningsson et al., 2021). The common "challenge" to all three programmes comprise students starting a real-life project without knowing the result. The students, thus, must be prepared to reconsider and continuously reflect on the uncertainties and the not-known throughout the process of inquiry and creation (Biesta, 2014; Bornemark, 2018; Christensen et al., 2021; Gwangwava, 2021). As a result, students are challenged to enhance their agency of change with competencies of critical and creative thinking and doing (Schön, 1987; Dirkx, 2006; hooks, 2010).

In *Sports Science* this kind of collaboration project occurs over several weeks in partnership with sports-related organizations. First, the students think and create an understanding of how the course content can be integrated into the operational activities of stakeholder organisations. Then, within the integration, the students use relevant theories to undertake an organisational analysis to increase their understanding of each organisation's needs. The analysis must integrate both internal and external perspectives and involve analysing a previous development project of the organization. Then, in a close dialogue and collaboration with a selected organisation, students conduct a project relevant to the course theme: *sports, events, and tourism*. In this project, the student acts as a "hired consultant" that will identify and solve problems for her/his collaborative organisation, thus applying co-created knowledge in practice.

Within *Media and Communication Studies'* second year, they interweave three core theoretical modules with a media project, in which students work in project groups collaborating with a stakeholder. First, students conduct a contextual assessment of a chosen media organisation and an interview study about media production methods. Thereafter, they analyse texts (e.g., websites) of the same organization and conduct ethnographic work with the organisation's audiences. These 'sub-studies' feed into an integrated media project where students use the analysis to co-produce an arts- and practice-based concept. The effort aims to strengthen the organisation (e.g., a new visual profile or public relations strategies) although firmly based on students' critical and creative perspectives rather than the conventional "business-as-usual." Students, thus, become co-creative change agents in collaboration.

The third example of *Co-creation and Collaboration* is an authentic challenge for the students at the Faculty of Odontology. Students are challenged throughout their entire education in active learning environments and through case-based teaching and learning. Students are encouraged to self-directed, active, and collaborative learning in a clinical contextual environment in their clinical training. The dental students work collaboratively and co-creatively with a clinical challenge during the last part of the dental program. The students work in pairs to examine and treat a child patient referred for orthodontic treatment to the faculty clinic from the private or public sector. The students are then challenged to integrate and apply previous research knowledge and practice from examining and treating adult patients to a new clinical context. Following the first clinical examination, various learning activities take place, where the students acquire relevant knowledge and skills to make a shared decision on how to investigate further, diagnose and make alternative treatment plans for their patients. Interprofessional collaboration involves a dental technician, dental assistants, the parents/guardians of the patients, and the referring dentist is part of learning during the treatment period. At a final seminar, the students present, reflect on, and discuss their patients' treatment outcomes with dentists and researchers, further enhancing the co-creative learning process.

Change Agents and Contextual Challenges

In the CBL-concept of Malmö University, education and research are integrated as co-creative academic processes involving society for knowledge acquisition and lifelong learning. In order for students to acquire a readiness to handle the unknown, contribute to a sustainable society, and become change agents, HEIs must enable the development of students' capacities to identify, initiate, inquire, and lead processes of societal change. Because of this, Malmö University considers students as partners, co-producers of knowledge, lifelong learners, change agents, and active global citizens. We emphasise that students act as mediators of transdisciplinary knowledge in co-design processes together with researchers, citizens, and societal actors. Thus, students will, hopefully, contribute to an awareness in the private, public, and civic sectors and among policymakers for social improvement in society.

At Malmö University, students' curiosity, creativity, and desire for learning are central to how we address and facilitate learning (Watson, 2018). We strive to stimulate students' engagement and involvement through participatory learning processes. Students are encouraged to connect what they already know to what we expect them to learn, and critically construct and co-construct new

knowledge in new contexts from the analysis and synthesis of their learning processes. Malmö University aims to make students aware of ever-shifting knowledge horizons (Deleuze & Guattari, 2015; Bornemark, 2020).

Malmö University staff continuously aims to challenge students to connect and integrate previous knowledge in new and real-life situations, promoting a sustainable learning society. We accomplish this through working with and elaborating relevant real-life contextual challenges in interdisciplinary learning environments (Dahlbeck & Widén, 2019). Through *Student Challenge Hubs*, we introduce meeting places for teachers, students, and stakeholders, as a way for HEIs to take an active role in the community and support students' learning and development of a readiness to act as change agents. In creating this kind of action-oriented and varied learning environment, students should be stimulated towards reflection, critical and creative thinking, and doing to prepare them for an exploratory-orientation towards lifelong learning (hooks, 2009). This transformation is central to the CBL approach.

At Malmö University, we anticipate that this approach spurs active engagement and development of new learning methods and practices, to enhance the effectiveness of imparting skills and relating academic knowledge to real-life challenges (Anthony et al., 1998; Hansman, 2001; Rose, 2009).

Examples of Change Agents and Contextual Challenges in Practice: A Global Challenge and Applied Criminology

Malmö University has chosen two apt examples of *Change Agents & Contextual Challenges*. Within the module, *The Law and Practice of United Nations* (UN), an enactment of UN negotiations is organised and structured around the practice of a role-play. The module attracts a diversity of students with various international, educational, and cultural backgrounds, which is the point of departure for the module. Students' pre-understandings and cultural competencies are emphasised, discussed, and shared to identify student's previous knowledge and experiences, which is then used in the enactment of the UN negotiation. Lecturers set up a scenario based on real UN-negotiation situations. Students represent different states and will get involved in different staged debates corresponding to the UN system and legal framework and handling conflicting interests. Students develop rhetoric and negotiation skills through the process and, more importantly, the need to draw from their own cultural experiences in a new challenging context. The aim is that students become cultural negotiators and play a crucial role in their learning and study process. Students also develop capacities and transferable skills through different activities, such as collaborations, discussions, and negotiations. The contextual challenges for the students are governed by the formal realities of the UN being an international organisation dedicated to global issues of the Sustainable Development Goals.

Within the *Criminology* programme, students are innovative in working with authentic challenges staged by the Malmö police force. Criminology research is integrated into practice as a part of students' professional training. Based on this, students, researchers, and the Malmö police force work in co-creative processes to approach and solve authentic cases. Students design studies, collect empirical data, analyse the results under the supervision of Criminology researchers, and involve the Malmö police force. The Police Force facilitates understanding the profession and students' roles as change agents in their future professional field. The study results are presented publicly, compiled, and published in written reports. What makes this learning design salient is that students' knowledge and work contribute to the everyday work of the Malmö police force and to Criminology researchers, who re-design work strategies and practices based on students' work.

CONCLUDING ARGUMENTS AND CHALLENGES

In this position paper, we at Malmö University theorise, conceptualise, and exemplify learning in HE, research, and innovation, through the approach of CBL. Our CBL approach is thoroughly anchored in theories of lifelong inclusive learning, as essential ingredients for HEIs' commitment and contribution to societal transformation. We argue that the role of HEIs is also to advance adult

lifelong learning towards a sustainable global learning society (Nylander et al., 2018). However, to make this successful, we realise the importance of integrating theories of change into adult learning concepts in HE (Kezar, 2014). HEIs need to meet, problematise, and critically act on global political, economic, and technological changes (Rosa, 2013) to collaborate towards a more philosophical and ethical sustainable learning society (Bornemark, 2018). In this position paper, we have given practical examples of how our CBL-model is used in all the university's five faculties, even though not all courses or programs are CBL-based. Furthermore, incorporating CBL is not easily achieved due to difficulties in designing innovative inter- or trans-disciplinary ways of working in courses and programs. We could also deem innovative teaching methods stressful to some lecturers, prolonging the change process.

In 2013 Malmö University first introduced CBL in its internal policy document *Strategic engagement for education, research, and cooperation 2013*,[2] and thus embarked on a journey towards a cultural shift within the university. Although a cultural shift may sound like an unduly statement, the university has purposefully worked towards an innovative interdisciplinary approach, integrating education, research, and innovation, connecting all faculties, staff, students, and stakeholders, to advance adult learning throughout the entire university. As a result, Malmö University is now building vertical and horizontal structures for change (Christensen et al., 2021).

Based on our experiences, we argue HE will contribute to the sustainable development of a global learning society by adopting the CBL-domains (Figure 1). The social mission of HEIs is pivotal, underpinning the CBL-domain *Diversity & Inclusion*, particularly in developing innovative and collaborative learning and research methods for social innovation. HEIs' role is also important in meeting a fast-changing technology and labour market demanding active, creative citizens ready to re-skill and re-learn. This role presupposes a need for the CBL-domain *Collaboration & Co-Creation*, through which students, staff, and societal stakeholders are enabled to tackle complex societal challenges through inter- or transdisciplinary perspectives on learning, where praxis and theory are interwoven. Through adopting the CBL-domain *Change Agents & Contextual Challenges,* HEIs can contribute to societal transformations. Students, staff, and stakeholders alike are thereby scholarly change agents, continuously working together with a readiness to co-create the not yet known future.

Working through the approach of CBL is indeed challenging, as it provokes and transforms the roles and the relationships between institutions, students, staff, and stakeholders. Such transformative processes require open-minded and inclusive co-creation of knowledge in bridging research and education in collaboration, and institutional and individual courage to allow and support the prototyping of creative innovative designs for teaching and learning in building a sustainable learning society.

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ENDNOTES

1 The change reform of the undergraduate dental curriculum drew inspiration from the medical education at McMaster University in Canada, Maastricht University in the Netherlands, and the Health Institute at Linköping University in Sweden.

2 *Strategiska satsningar för utbildning, forskning och samverkan 2013* translated as "strategic engagement for education, research and cooperation 2013."

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