Learning to lead innovation and change[1]

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Summary

Capacities to drive collective learning, address jointly complex practical challenges and create innovative solutions are seen essential for future graduates. How to prepare students to lead complex collaborative learning, change and innovation projects? How to assist them to develop knowledge and skills needed for resourceful teamwork with other people who have different expertises, experiences, and interests?

Systems, Change and Learning is a blended graduate course in the Maters of the Learning Sciences and Technology program that aims to develop students' capacities to lead complex organisational learning and educational innovation projects. Rooted in systems theories, cybernetics and the learning sciences, this course: 1) introduces students to the *theoretical approaches and methods* for understanding complexity, facilitating individual learning and managing change, and 2) provides them with *practical experiences* to engage in systems inquiry and collaborative innovation design projects.

The course draws on the second-order pedagogy[2] and grants students' agency to design not only the innovation, but also their own learning and innovation process and environment. Students choose complex real life organisational learning or educational change challenges and, over the course of the semester, work in small innovation teams by analysing an encountered problematical situation, modelling possible scenarios and developing innovative solutions. As a result, each team creates a practical guide for Change and Innovation Managers who will be tasked with implementing the proposed innovation in an organisational setting.

The main emphasis is on fostering expansive learning and deliberative innovation culture trough cultivating *systems thinking*, *design practice* and *responsive action*. Through engaging in systemic inquiry, innovation design tasks and authentic teamwork, students develop a number of graduate attributes that are critical for joint learning and knowledge-informed, responsive action in modern workplaces, such as analytical and integrative thinking, effective teamwork, multidisciplinary and intercultural competencies.

Evaluations show that this course promotes deep student engagement and brings about transformative learning experiences. It is now offered as an elective in two other interdisciplinary masters programs.

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[1] Presentation slides are available here

[2] Maturana & Varela, 1992; von Foerster, 2003; Blackmore, & Ison, 2012.

Objectives

As learning becomes more pervasive and collective, educators play increasingly more diverse roles in organisations and society. Teachers, educational designers and other professionals who take various learning management roles in educational and other organisational settings need to be competent not only to foster individual learning, but also to facilitate collaborative learning and lead change and innovation programs.

Systems, Change and Learning is a blended course that aims to assist future educators to become skilful leaders of complex collaborative learning and educational innovation projects. Through engaging students in systems thinking, design practice and responsive action the course aims to develop two critical capacities.

First, capacities to understand diverse ways of thinking about the encountered complex challenges and find productive solutions that accommodate multiple, sometimes conflicting, views are seen as vital for professionals who work in multi-professional teams or solve complex issues that involve multiple stakeholders[3]. However, university students rarely learn how to elicit diverse worldviews, achieve mutual understanding and create, in a disciplined and purposeful way, innovative practical solutions. To address this issue, the course builds on the second-order systems views[4] and aims to provide students with knowledge and skills to use *diverse systems thinking and design methods*[5] that help enhance awareness of diverse worldviews and create shared, culturally desirable and practically feasible solutions.

Second, capacities to collaborate effectively are critical for productive group learning and teamwork. However, students rarely know what makes collaboration effective and often find it difficult to organise their joint learning and work productively. In order to addresses this challenge, the course aims to develop students' understanding of *how people, teams and organisations learn*[6], and provide students with authentic experiences of deliberatively and constructively managing teamwork.

Overall, through the project work, discussions and analytical reflections, the course provides students with a rich collaborative learning and innovation environment where they have possibilities to engage with core theoretical ideas of the systems, learning and change and begin to think and act like professionals who are tasked with bringing about productive individual and collective learning and systemic change in an organisational setting.

Approach

The approach combines the ideas of *systems thinking*, *design practice* and *responsive action* and aims to develop students' capacities not only to participate in innovation and create knowledge, but also to organise collaborative learning and teamwork, and lead deliberative innovation.

The design of teaching and learning draws on four fundamental principles.

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[3] Derry, Schunn & Gernsbacher, 2005; Edwards, 2010.
[4] Maturana & Varela, 1992; von Foerster, 2003.
[5] Checkland & Poulter, 2006; Checkland, & Scholes, 1999; Ison, Blackmore, Collins, & Furniss, 2007; Nelson & Stolterman, 2012.
[6] Engeström, & Sannino, 2010; Sawyer, 2015; Senge, 2006.

1. *Making knowledge actionable and action knowlegeable.* The course emphasises the critical link between the principled (theoretical) knowledge and situated (practical) actions. On the one hand, students learn key ideas and methods of systems thinking, learning, innovation and change management[7], and make this general knowledge actionable by grounding concepts and methods in their own learning and innovation experiences. On the other hand, students approach real world challenges by designing innovative practical principled knowledge products[8] that could guide knowledgeable actions of other people across diverse situations.
2. *Learning and innovation through creating epistemic artefacts.* The characteristic feature of modern knowledge work is that it is increasingly characterised by joint work creating material and digital knowledge objects or epistemic artefacts, such as models, blueprints, prototypes, principles, and other expressions of innovative solutions[9]. During the course, the students learn to recognize and deliberatively create various kinds of epistemic artefacts that allow them to share their ideas across multidisciplinary and multi-professional boundaries and mediate joint knowledge work and innovation.
3. *Linking organisational, team and individual learning.* Organizational learning and change is impossible without individual learning and change. In order to help students to see the synergy between collective and individual learning, the course emphasises deep relationships between the domain of collective action and the domain of personal change.[10] That is, students' thinking of how to bring about learning, change and innovation in an organisational setting and how to organise their teamwork is simultaneously informed by both: 1) their knowledge of the respective literature on systems thinking, change and innovation management[11], and 2) the ideas of the learning sciences of how people learn[12]. This understanding not only allows students to design more productive innovations, but also enables students to see the dynamic relationship between their team's learning and individual learning.
4. *Learning to assemble productive learning and innovation environments.* Learning to organise teamwork knowledgeably, responsively and deliberatively is central to this approach; and students' capacity to create an environment that supports collaboration and distributed knowledge work is key to it[13]. Students are tasked to assemble their own technological and social environment that is conducive for productive teamwork and innovation. They are provided only with basic ideas on how to organise teamwork and a small set of technological tools for synchronous and asynchronous communication and then are tasked to supplement this "minimalistic toolbox" with other techniques and technologies for sharing ideas, collaborative writing, and coordination of joint work. Through this experience, students learn not only to innovate in existing, created by others, environments, but also to co-create such environments for diverse collaborative knowledge tasks autonomously.

[7] E.g., Checkland & Poulter, 2006.
[8] Bereiter, 2013.
[9] Bereiter, 2002; Blackmore & Ison, 2012; Nicolini, Mengis, & Swan, 2012.
[10] Senge, 2006.
[11] E.g., Checkland & Poulter, 2006.
[12] E.g., Sawyer, 2014.
[13] Goodwin, 2005; Hutchins, 1995; Sterelny, 2012.

Engagement

Students and teachers engage in joint learning and innovation in four main ways.

1. *Understanding multiple perspectives of real-world complex challenges.* Students intentionally are asked to solve wicked ill-structured issues that involve complex interdependencies between multiple stakeholders and do not have one definite resolution. By drawing on the systems approaches that have their roots in the second-order cybernetics (so called "soft-systems thinking"), students start appreciating that social issues cannot be understood by using instrumental means-ends analytical methods and solutions cannot be engineered from one particular perspective; rather, social change and innovation require deep appreciation and accommodation of diverse worldviews, including personal and organisational histories, cultural norms, values and experiences[14].
2. *Intercultural and multi-professional experiences.* By working in groups students experience the challenges of learning together effectively, understanding each other points of views, integrating their perspectives and co-leading the team through the learning and innovation process. Students' diverse professional and cultural backgrounds and experiences provide them with authentic possibilities to experience multi-professional and intercultural collaboration.
3. *User-oriented design products.* While the course grounds students' innovation and leadership capacities in a solid conceptual understanding, nevertheless it strongly emphasises a practical action-oriented nature of intellectual work. Students have possibilities to choose innovation challenges that are directly relevant to their current professional work or future career plans. They assume the role of consultants who are tasked to design a Guide for Innovation Managers who will be leading this innovation in an organisation. Thus, the Guide should not only provide advice as what needs be done and why, but also offer practical techniques and tools showing how this could be done.
4. *Students' agency: teachers and students as co-designers.* The course builds on the view that learning and knowledge itself cannot be pre-set or prescribed by teachers, but pedagogical and epistemic infrastructure, with its social and physical arrangements, that is conducive for learning and knowledge-building, can be co-created together with learners[15]. In this course, teachers mainly play the role of co-designers of students' learning and knowledge work, by creating initial tasks and other basic organisational structures and facilities, and later adjusting their initial pedagogical arrangements to emerging students' needs by suggesting possible techniques for solving encountered issues, asking reflective questions, and other complementary ways. By doing this, teachers deliberatively grant agency to students for organizing and designing their knowledge work, and engage with students' learning in indirect, yet critical and genuinely collaborative, ways.

Impact and results

Evaluation and feedback for this course has been overwhelmingly positive. Since 2010, it has been nominated three times for an outstanding teaching award. The following common themes are reported in formal course evaluations and students' feedback.

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[14] Checkland & Poulter, 2006; Checkland & Scholes, 1999; Ison, Blackmore, Collins, & Furniss, 2007.
[15] Blackmore, & Ison, 2012; Li, 2002.

The novelty and effectiveness of the pedagogical approach:

> "This unit was a challenge for me, a completely new and different way to learn, but very effective!!"

High levels of student engagement, which frequently resulted in contributions to discussions and groupwork that exceed formal course requirements by up to 2-3 times:

> "The Innovation Challenge gave us opportunity to work as a team on an ill-structured problem, which was highly motivating and great learning experience."

An appreciation for a theory-based approach to practice:

> "I always held the view that 'contextual knowledge' was the most important aspect of learning. However, this unit has provided me with many insights and conceptual foundations that enabled me to observe situations more critically. Concepts, such as System Thinking and SSM [Soft System Methodology], were unique to me. It has improved my professional aptitude and attitude as a teacher."

Productive experiences of teamwork:

> "I learnt far more doing the teamwork than I'd expected to. There was a great exchange of ideas and knowledge. Overall, a different but very rewarding course for me."

The value of learning autonomy and the ability to act as self-directed learners:

> "[The best aspect of the course is] the innovative ways that the course is designed to encourage, or actually demand, autonomous learning."

Overall, students' feedback shows that this course provides them with a productive learning infrastructure that facilitates a move from first-order (instrumental) responses to learning, to second-order responses and engagement that include the ability and disposition to use theoretical ideas in practical activity, a sense of agency and responsibility for one's own learning.

Next steps

Individual and collective capacities to think systemically, design practical solutions and act responsively are critical for professionals in many domains. However, effective pedagogies for teaching and learning this kind of knowledge and skills are underdeveloped, despite being urgently needed. Our experience teaching this course provides first insight into teaching and learning for knowledgeable action and innovation in higher education[16]. How to expand the culture of co-innovation further, and engage students in the deliberative co-innovation of not only of (their) learning, but also of (our) teaching is our next innovation challenge.

[16]A synthesis could be found in Chapter 19 of the forthcoming book: Markauskaite, L., & Goodyear, P. (in press, 2016). *Epistemic fluency and professional education: Innovation, knowledgeable action and actionable knowledge*. Dordrecht: Springer.

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