

Chapter 22

Harnessing Youth Activism with/in Undergraduate Education: A Case Study of *Change Lab*

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This report captures stories told by key stakeholders involved in the development and current offering of the *Change Lab* program. It attempts to honor the voices of many (but not all) of those involved in its inception including former and current students who conceived of this form of undergraduate education in the first place. These players (co-authors on this chapter) act either as leaders in the design of our experience-based, dialogue-driven project *or* as active participants, steering the development of future forms the program might take. Through their innovation, passion, and commitment, they provide insight into the power of dialogue and sustainability education that (in this case) is focused on the improvement of the university campus as a living lab for sustainability.

By weaving together each of our own personal accounts, we hope to capture the energy and enthusiasm that we as individuals have shared with each other during class meetings and research visits during *Change Lab*. We also share the many design lessons we have learned while working together over a period of many months. Our narrative is phenomenological and ethnographic (Maggs-Rapport 2000). In other words, while each of our stories are unique, it is our intention that they may reveal certain qualities or conditions found in other university communities when it comes to the development of interdisciplinary, environmental and experiential forms of undergraduate education.

Finally, three distinct, but overlapping narratives compose this work: the first a *theoretical* narrative (lead by Carlos and David) explores the many forms that activism *might* take in undergraduate education; the second, a *course designer* narrative (lead by Jennifer and Deanna) recounts events and actions inspiring us to

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conceptualize and develop this project; and lastly, a *participant* narrative (lead by Audrey and Sabrina) recounts the experiences of students enrolled in *Change Lab*. Each of these are written in the first person present and tell the story of an ongoing, evolving *activism* occurring at the undergraduate level at a major comprehensive university in Canada.

Activism and Education

Activism, taken from the Latin root *actus*: “a doing, a driving force, or an impulse,” refers to taking direct action to achieve or impede social, environmental, economical and political change. Activism presents itself in many forms: “from ordinary people writing letters to newspapers, or holding local meetings, through to the activities of international organizations like Amnesty International or Greenpeace, which are well-funded groups that conduct international campaigns” (Ricketts 2012, p. 19).

There is a range of issues that could initiative activism from the general public. For the past 30 years or so, environmental causes have been the focus of public attention, however, issues such as human and animal rights, fair trade, gender issues, heritage protection and world debt, have become strong issues of contention. Activism is not limited to just high profile causes either, other examples include: action surrounding disabled people; abandoned animals; seniors; or advocating for increased funding for cancer research (Ricketts 2012). The actions of the public to advocate on behalf of a cause have played an important role in shaping society: *It is the work of activists and social movements which pushes society along, prompts it to deal with its own failings and inequalities and helps to manifest a vision of a better world* (Ricketts 2012, p. 6).

Activism and education however, are a controversial pairing. For many, education is seen as impartial and should focus solely on preparing children or young adults with the skills to participate positively in society. Still, while our collective and globalized consciousness appears headed (slowly) towards a paradigm shift for sustainability (see Zoller 2012), little has changed in education to facilitate this shift (Stevenson 2007; Wals and Jickling 2002). Sustainability education then (viewed by those seeking the status quo) has been described as being “at best a distraction from the core curriculum and at worst a platform for the promulgation of radically subversive messages” (McClaren and Hammond 2005, p. 267). The challenge lies in developing educational programming that reflects a shift towards sustainability, with a process that “accurately [reflects] current debates and the state of knowledge about human-environment interactions” (McClaren and Hammond 2005, p. 267).

For sustainability to take a serious hold within the education system it will “demand [a] serious didactical re-orientation” (Wals and Jickling 2002, p. 228). Unfortunately, research continues to report that in both K-12 and post-secondary education, there is a persistence of a traditional *teaching to know* approach characterized by teacher-led lectures and an emphasis on low-level processes such

as rote memorization (Barak et al. 2007; Boddy et al. 2003; Zoller and Nahum 2011). This approach develops only lower-order cognitive skills (LOCS) in students, and sadly, teachers are often the only ones in a classroom engaged in higher order processes (Stevenson 2007). LOCS are associated with recall of information, comprehension and application; while higher order cognitive skills (HOCS) are representative of the capabilities to analyze, synthesize and evaluate the world, or in short, *learning to think* (Zoller 2011, 2012; Zoller and Nahum 2011). In our opinion, the development of higher-order skills should be a primary goal for undergraduate education within any discipline.

Activism and Action Competence

In this research, we view activism through a lens of ‘action competence’ in order to resolve some of our own dissonance about the role of undergraduate education and how this conception of ‘competence’ is a possible ideal for sustainability education. *Action competence* (defined here provisionally) can be seen as “a capability, based on critical thinking and incomplete knowledge, to involve yourself as a person with other persons in responsible actions and counter-actions for a more humane world” (Schnack 1994). In this sense, action competence may indeed be understood as an essential component supporting the development of activism in students. We elaborate on this theme here, while also providing some thoughts as to how this may be connected to our own views of student activism with/in undergraduate education.

The concept of action competence, Jensen and Schnack argue, should occupy a central position in the theory of environmental or sustainability education as many of the crucial educational problems concerning a traditional liberal education are united and activated by this concept (Jensen and Schnack 1997). Our interests in beginning with action competence as a potential outcome for undergraduate education are based both on skepticism about a dominant educational paradigm which manifests itself in a tendency towards individualization – and that often regards the educational process as simply a question of behaviour modification (Jensen and Schnack 1997). At the same time, action competence can be seen as an alternative to more traditional and largely science-oriented approaches to sustainability education.

Bishop and Scott (1998) argue that (sustainability) education can be characterized by a ‘rhetoric’ of action-taking and that the call for the development of personal action competence is only one example of this. Their work critically examines the concept of action competence which they define as (paraphrasing): a set of capabilities which equip people with the ability to take purposive and focused action, and which embodies a democratic commitment to be participants in the continuing shaping of society. They note that action competence is seen by some as a crucial outcome in education, since it brings together its processes and practices with an urgent need to develop democratic citizenship skills (and values) in students. However, deconstructing this notion, Bishop and Scott also note a tendency for

action competence to undervalue the place of science in the construction of knowledge and to a holistic understanding of environmental issues.

While noting this tension in our own work, the development of *Change Lab* is predicated on an assumption that the process of students taking action with/in their undergraduate education potentially develops *within them* a form of action competence. Action competence (for us) means students have the ability and willingness to take action on issues of campus sustainability that interest and engage them. In practice, it is developed as students learn about sustainability issues, then plan and take informed action on those issues. Further, many factors can potentially support the development of students' action competence, including: experiential learning, personal reflection, knowledge construction, future visioning, action-taking, and community building. All of these tools assist us when learning about campus and sustainability related issues.

What follows is a narrative focusing on the design features of Change Lab and how these are intended to facilitate or foster student activism within it. It includes perspectives on why the course was developed, its assignment structures, workshop delivery models and the content and processes that inform our work. The overarching story (as recounted by Jennifer and Deanna) also describes how the course evolved and how we envisioned it encourages and facilitates activism on campus, and action competence within students.

How Education Became Our Activism

What happens when two engaged students' education transforms them? *They then try and transform their education.* This is our story of how education became our personal activism. In 2009, we found ourselves in the *Semester in Dialogue* program, a unique full-time, interdisciplinary program offered at our university. It would turn out to be one of the very few opportunities in our formal education where we were not just told about the problems of the world: we were expected to be actively engaged in addressing them. This program not only invited solutions-oriented thinking, it gave us space to realize our full potential, access outstanding mentorship opportunities, and build a community of support. The *Dialogue* program exposed us not only to the expanse of what was happening in our local community but also integrated us (and our peers) within it. For us, the experience was nothing short of transformative.

Returning to regular classrooms in the fall after *Dialogue* provoked deep cognitive dissonance for us both. Our expectations of what the university could and should be – a place for civic engagement and action on the pressing issues of the twenty-first century (as we now believed) had been radically transformed by our experiences. Still, we returned to find the institution just as we had left it: (for the undergraduate) focused on getting a theoretical grounding and writing papers seemingly destined only for the recycling bin. Where we were once top students, happily going to lectures and engaging with our course materials, the contrast between our

earlier dialogue experience and the reality of the lecture hall was so stark, we were now debating dropping out.

After many long conversations with peers and mentors, instead of leaving the university, we decided to make education the next focus of our social change work. We wanted to help create situations for other students to receive the same opportunity that we were given. Even more so, we wanted to create spaces that would empower students with skills and abilities needed to act and create positive change in this time that we face so many interrelated challenges as a global society. This space became the *Change Lab*.

Our program is designed to foster and facilitate a specific set of action competencies in students to enable them to mobilize their capacity on issues of personal and social importance. It focuses on the study and intersections of sustainability, social change, and education. If we consider activism in its broadest definition to be “efforts to create positive social change,” then *Change Lab* is designed to incubate and foster the skill set needed to effect and bring about that change, through both direct experience and purposeful curricular intervention. When we designed this experience, it was with the intention to try to equip students with the skills and abilities they would need to be effective change agents both at the university and in their communities after graduation.

The overarching objectives of *Change Lab* then are: to empower students to move ideas to action; to provide social change skills training; to increase campus sustainability; and to allow students to experiment/ take risks while critically reflecting on their actions: all of this within a curricular context. The program spans two semesters. The fall term coalesces around themes of personal development, sustainability, skills-oriented workshops and place-based curriculum. During this time, students propose and design sustainability projects with a view to their implementation in the following term. The spring term focuses exclusively on these emergent projects. In short, through the *Change Lab* design we attempt to develop students’ action competence in the following ways.

Student Empowerment

Students (as individuals) can often experience a sense of social isolation and disconnection from their community, which can be one of the largest barriers to young people getting involved in civic life and in their community. We intend to foster student empowerment through the facilitation model used to run *Change Lab*: actively challenging the ‘sit back and be told’ culture most students have experienced through the entirety of their formal education. Self-direction is paramount in this facilitated experience and students are encouraged to be active partners in co-constructing the curriculum. When the syllabus is handed out, a *DRAFT* watermark runs across it and students are invited from the first day to contribute to the design and details of their experiences. The instructors are not “instructors” per se but facilitators and every effort, starting with the syllabus, is made to demonstrate

and create a horizontal power dynamic that requires students to take ownership of their own course experiences.

Assignments themselves are also aimed to foster empowerment. *Power In* (adapted from the *Dialogue* program) is one such assignment. Its purpose is to understand the decision making processes that effect sustainability at the university, and in particular, key stakeholders and interest groups related to campus sustainability. It is meant to engage students with the complexity of multi-stakeholder decision making processes and the intricate power dynamics of the institution they are attempting to change. During this assignment the requirement is that students interview five key decision makers.

Social Change Skills

Effecting social change at the university also requires a unique skill set gained through both direct experience and training. In the conception of *Change Lab*, it was important to us to find ways to both explicitly and implicitly provide students a platform for garnering and experimenting with this skill set. There are three key ingredients we provide students to work with in this regard:

Mentorship Students have access to a network of mentors and project advisors for personal growth and to help them complete their projects. We feel that strong mentorship fuels growth. Throughout the course, we offer individual meetings with students and encourage them to consult with these community members.

Training from Community Allies Community professionals are invited to the class in order to provide valuable skills training workshops for our students. This also fosters dialogue and connections between community practitioners who are actively engaged in social change work and diffuses their wisdom and skills amongst the students. The workshops are diverse with topics ranging from strategic planning to narratives-based communication.

Focus on Collaborative Structures Addressing complex social problems through activism also requires a capacity to work collaboratively across disciplines, sectors, cultures and perspectives. Designing *Change Lab* as an interdisciplinary experience with an emphasis on team projects allows students to develop confidence and capacity working within a collaborative structure.

Increasing Campus Sustainability

The central assignment for the course is the design of sustainability projects using the campus as a living lab. The goals of the projects are simply to increase sustainability on campus and students design and execute these projects as part of their coursework. This gets students to practice moving ‘ideas to action.’ In the first few

weeks of the course, key sustainability stakeholders are brought into the class. They engage with the students on the strategic direction of the sustainability agenda at the university and also pitch potential projects. We encourage students to work with different campus and community partners so that their projects can live on beyond our 8 months spent together.

Critical Reflection

Through bi-weekly reflections throughout the year and a final portfolio assessment at the end of the fall term, we also give students ample space to explore their critical voice. Mandating reflection throughout the course experience is intended to foster deeper thinking on their activism, while also developing in them greater metacognitive capacity. Throughout this process, students demonstrate personal, professional and philosophical growth – necessitating a need to think about their learning both inside and outside of the classroom. The assignment formats are also not restricted to a written medium and so, students are encouraged to explore diverse and creative forms of communicating their ideas, thoughts and aspirations to one another.

Following this account of the curriculum and course design perspective, is a continuation of the Change Lab story from the unique perspective of our current students who experience this learning environment first hand. The following participant narrative (recounted by Audrey and Sabrina) discusses the types and instances of activism that are seen as arising spontaneously out of student participation in course meetings and workshops. It includes a description of some examples of planned activism and action competence outcomes, while also discussing factors that may be strengthening or constraining their occurrence. Lastly, it considers which social factors or skills are required to facilitate activism with/in an undergraduate education.

Change Lab Through the Eyes of Students

Last September, we decided to take this course to further our own investigations on personal development and sustainability, and to explore how to create social change around us. As graduate students, we were invited by the facilitators to become *participant-observers* in this class. This implied that we would fully engage in the class workshops and projects, but that we would keep track of our observations within the class. In addition to class projects, we agreed to take part in the research side of *Change Lab*. In the past few months, we have observed what our cohort is experiencing in this new and engaging learning process. We watch them creating projects, as well as describe how we ourselves are growing within this unique environment. From a participant's point of view, we see three general types of activism

being suggested in *Change Lab*, which we classify as *infrastructure*, *education*, and *events*.

Infrastructure encompasses projects that consider permanently using physical space, infrastructure and/or materials. Ideas that came up in the classroom include: a concept for a rooftop-garden; a design for a gazebo as a social space to connect people, and plans for reducing toxic and other waste within the university campus environment.

Education entails projects that envision work on curricular changes within the university education system. Classroom ideas here include: working on models for experiential education and promoting its spread across the curriculum; as well as adding an 'E' (for environment) criteria for courses that would be a graduation requirement.

Short-time public *events* include projects that reach out to people to make them think or act in a more sustainable way. Ideas here include: an exhibition on a future vision of a sustainable University campus; an art piece made out of waste materials; a presentation of many sustainability ideas at a public event such as Pecha Kucha Night [<http://www.pecha-kucha.org>]; and a student summit to promote experiential learning.

We acknowledge that there are overlaps between these categories. For example, encouraging and promoting experiential learning inspired a team to create an event called the *Student Summit* that could showcase course opportunities and learning opportunities available within the university. The underlying principles (or meanings) for all of the types of activism we described are *social* sustainability and *environmental* sustainability. All of the ideas were proposed by students and presented to the group as potential group projects.

Factors Supporting Activism

We witness the ideation and suggestion of many activist projects by guests, facilitators, and our peers, and can identify different factors that help provoke, inspire, and foster the development of ideas.

First, key sustainability stakeholders and sponsors of *Change Lab* are invited to present potential projects or areas that require work with regards to sustainability on the campus. Even when these ideas are presented by people outside of our group, we can recall instances where activism grew from this. When, for example, the new director of the university's sustainability office explained that they were in the process of creating a narrative to articulate a vision for the future of the campus, students with a creative background immediately imagined a project in which they would create a futuristic and sustainable vision of the campus. Students imagined this project to be presented as an exhibition of photographs, objects and prototypes, with short video presentations. While this is not exactly what the director had in mind, his description of the idea was a starting point for generating ideas within a given realm. Eventually, students elected to

pursue this project; discussing their ideas with the stakeholder of the sustainability office and developing a new collaboration.

Second, as part of a process for creating project proposals, our class was invited to an event hosted by the *Vancouver Design Nerds*. In this 3-hour *design jam*, students ‘pitch’ ideas of potential projects, ideas are grouped by themes, teams of four work on a specific theme, and present the results of their brainstorm and discussion. This method – part of an accelerated design process that allows everyone to suggest ideas without the fear of being judged (since in a brainstorm, there are no bad ideas!) also develops our ideas to a fuller extent. We think that the openness of the process encourages students to take on activism related initiatives. Many students pitched ideas even if felt they were not ready. This might be partly due to the fact that our group had already been developing a small strong community ‘feel’ to it.

Third, at the aforementioned design jam, the course facilitators (Deanna and Jennifer) proposed an idea they first called *Education Ninja* aimed at provoking change in the curriculum, and including more experiential learning opportunities but also supporting sustainability initiatives. This idea was adopted with passion by one of our classmates who rallied a team to implement a variation on this idea.

Fourth, a strong sense of community in the classroom has encouraged us, extroverts and introverts, to propose ideas for discussion, while feeling safe and being sure that others will listen and not judge. We observed this in several self-directed in-class proposal sessions for project ideas. We also experience this feeling of openness through the online activities and exchanges we pursue. As a group, we use a Facebook group to propose ideas, post links, images, and videos to share our intentions and ideas. This bond between us is initiated during the first weekend of the semester, when all students attend a 2-day retreat to discuss their ideas on sustainability, create a community agreement, and get to know each other. In summary, we see that the ideas proposed, the design process, and our group’s community feeling are all factors that support students in the development of project proposals.

Lastly, we witness how the individual development and personal growth of students supports and empowers us for future activism within and beyond Change Lab. In the last in-class session of the first term, we present our individual personal, professional, and philosophical growth through portfolios, which take different formats (paintings, stop motion animations, essays, timelines). It was obvious to us how each of our peers grow through this unique experience and how we are all able to see this affect our perspective on education and future careers.

Factors Constraining Activism

As participants in the course we also observe several barriers and constraints that can hinder the development of activist ideas within *Change Lab*.

The aim of the program is to get us working on projects that promote and foster sustainability on campus. All participants go through an application process and prove their interest in sustainability, which demonstrates their motivation. However,

sustainability is a broad and flexible term that can hold multiple definitions and areas of interest and application such as social, environmental, and economical sustainability. We observe that students often have different interests, passions and opinions when it comes to work on sustainability and that many diverging directions are proposed for the potential projects. Differing directions and definitions can create feelings of misunderstanding among students, and eventually create barriers to activism. For example, a project focusing on environmental sustainability might also explicitly exclude social sustainability because it supports the regeneration of an ecological space on campus but does not account for how students might use it.

Further, *Change Lab* invites students from many different faculties to apply. Bringing together people with different backgrounds studying different disciplines can be an advantage when tackling complex issues like sustainability but also a drawback in the process of finding and collaborating on a shared topic of interest. It is known that interdisciplinary groups can be complementary and work well together, however we often observe difficulties around finding and defining a shared project to work on. It is also difficult discussing projects with different disciplinary assumptions. Jargon, basic theories and key concepts within each discipline can be misunderstood among the students. For example, students in health, geography, international studies, sociology and design don't understand the term 'narrative' in the same way. If a project is using this term to describe what the students intend to work on, it can be hard for others to understand exactly what a project might entail.

When it comes to the final phase of our decision-making on project ideas, differing areas of interest and skills can have major influences. Some people want to work on social sustainability, while others want to create solutions for growing food, yet others want to work on the education system and/or get people engaged. Lastly the focus points may vary among students within a project group, which creates tension in the group and can have an effect on team building and in the selection of a project to work on. More specifically, we observe that some people have great motivation for a certain project and become leaders for the moment, installing a certain sense of competition between students who want to find teammates for their own projects, creating an environment where the ability of communicating ideas clearly and engagingly is quite important for successfully moving a project forward. When, for example, a student has an idea but does not communicate it well, it may not catch the attention and interest of other students. However, we see that the sense of community and as a workshop the design jam's pitch and brainstorming sessions really help us to listen to everyone. The dynamics of creating project teams is a process that can potentially eliminate good activist ideas because of group dynamics, people's personalities and interests, communication skills, or how well and clear ideas are formed in the first place.

A missing skill can also be a barrier, especially when actually developing a project. We interviewed students from past *Change Labs* who told us that in the project development phase it was sometimes a drawback that students were missing certain skills such as project management, dialogue, emotional intelligence, critical reflection, public speaking, or specific software skills. In addition, past students told us that personal values such as: possessing an honest commitment, genuine investment,

and clarity of vision are sometimes lacking in project teams, creating another potential barrier to completion of a project. We clearly see how certain skills are useful and why workshops focusing on skills such as collaboration, the use of narrative, and the design process are coordinated for us. Currently, in the first term of this year's *Change Lab* students have diverse reactions to each workshop and it is not clear yet if they have helped us gain the needed skills or competences in these areas. Finally, we have also (sometimes) observed frustration, anxiety or stress due to the new experience of self-direction that this class encourages. For some students that much freedom can become numbing and can potentially prevent us from proposing ideas, choosing a project or leading a team.

A Developing Model for *Change Lab*

Through a combination of narrative, ethnographic and auto-ethnographic methods we have attempted to describe how *Change Lab* is developing into a new model for environmental, experiential and self-directed learning and an important part of the undergraduate university experience. This chapter tells the story of its conception, development and implementation through three lenses: a *theoretical* lens exploring the many forms that activism may take and referencing the notion of 'action competence' as an ideal for sustainability education; a *course design* lens recounting events and actions that inspired the conceptualization and development of our project; and a *participant* lens recounting the experiences of students enrolled in *Change Lab* as they struggle to develop action competence while also realizing their individual and collective goals.

Is the model perfect? No. But it is new and being continually refined. While it provides a container for students to engage, we realize that not all students leave this experience activated, however, we do think that many will have more confidence in pursuing their passion. The *Change Lab* program gives students an opportunity to think deeply about what they really care about and about how (and why) they can make a difference.

Today's university graduates are inheriting an increasingly complex and uncertain world—and will take jobs in fields that did not exist even a decade ago. They will be expected to respond in *real-time* to challenges that the conventional university curriculum has (arguably) failed to prepare them for. When we look at the university campus, we see latent and un-activated potential for sustainable actions all around us. Yet, students spend countless hours a week sitting in lecture halls; grappling with issues from climate change to social decay, but are never afforded the space and time, nor equipped with the skills, to act. As a member of *Change Lab*'s inaugural cohort put it, we want to create classrooms that "*recognize the artificiality of their four walls,*" and provide opportunities for students to "*get real about values, connect with others ... and build visions and projects that are aligned with what they really want for themselves, their place of learning, their community and the world.*"

We think university educators need to ask themselves: What is their role in these times of uncertainty? What kind of graduates do they want to help create? By asking these questions and by changing the way we educate, we may eventually see a radical shift in the type of society we shape.

References

- Barak, M., Ben-Chaim, D., & Zoller, U. (2007). Purposefully teaching for the promotion of higher-order thinking skill: A case of critical thinking. *Research in Science Education, 37*, 353–369.
- Bishop, K. N., & Scott, W. (1998). Deconstructing action competence: Developing a case for a more scientifically-attentive environmental education. *Public Understanding of Science, 7*, 225–236.
- Boddy, N., Watson, K., & Aubusson, P. (2003). A trial of the five Es: A referent model for constructivist teaching and learning. *Research in Science Education, 33*, 27–42.
- Jensen, B. B., & Schnack, K. (1997). The action competence approach in environmental education. *Environmental Education Research, 3*, 162–178.
- Maggs-Rapport, F. (2000). Combining methodological approaches in research: Ethnography and interpretive phenomenology. *Journal of Advanced Nursing, 31*, 219–225.
- McClaren, M., & Hammond, B. (2005). Integrating education and action in environmental education. In E. Johnson & M. Mappin (Eds.), *Environmental education and advocacy: Changing perspectives of ecology and education* (pp. 1–28). Cambridge: Cambridge University Press.
- Ricketts, A. (2012). *The activists' handbook: A step-by-step guide to participatory democracy*. London: Zed Books.
- Schnack, K. (1994). Some further comments on the action competence debate. In B. B. Jensen & K. Schnack (Eds.), *Action and action comments as key concepts in critical pedagogy* (Studies in educational theory and curriculum, Vol. 12, p. 190). Copenhagen: Royal Danish School of Educational Studies.
- Stevenson, R. B. (2007). Schooling and environmental education: Contradictions in purpose and practice. *Environmental Education Research, 13*, 139–153.
- Wals, E. J., & Jickling, B. (2002). “Sustainability” in higher education: From doublethink and newspeak to critical thinking and meaning learning. *International Journal of Sustainability in Higher Education, 3*, 221–232.
- Zoller, U. (2011). From teaching-to-know-to-learning-to-think for sustainability: What should it take? And how to do it? *Journal of Modern Education Review, 1*, 34–40.
- Zoller, U. (2012). Science education for global sustainability: What is necessary for teaching, learning, and assessment strategies? *Journal of Chemical Education, 89*, 297–300.
- Zoller, U., & Nahum, T. L. (2011). From teaching to KNOW to learning to THINK in science education. In B. J. Fraser, K. G. Tobin, & C. J. McRobbie (Eds.), *Second international handbook of science education* (pp. 209–229). Dordrecht: Springer.

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