

SITUATED LEARNING METHODOLOGIES FOR ACTIVISM IN DEVELOPMENT EDUCATION AND EDUCATION FOR SUSTAINABLE DEVELOPMENT

In this article, **Nancy L. Serrano** and **Dr. Roland Tormey** explore how to embed development education and education for sustainable development within the post-primary curriculum in Ireland using three situated cognition methodologies: cognitive apprenticeship; knowledge building; and problem-based learning.

Introduction

Development education (DE) and education for sustainable development (ESD) have both made progress over the last number of years integrating into the Irish post-primary curriculum, as can be seen from the work of Gleeson, et al. (2007). Gleeson's research highlighted the importance of development education in the life of a number of schools, the frequency with which teachers address development issues in their teaching and the opportunities that exist to integrate DE across the curriculum. At the same time, the research also highlights the difficulty in incorporating an action-orientation into the existing curriculum, particularly outside of civic, social and political education (CSPE). As Osler notes, development education '... encourages the linking of ideas with action for change and a radical approach to the issues we all face working for a new international, social and economic order' (1994). As such, a focus on action and on developing an action-orientation should be an essential element of development education in schools.

This article explores why and how situated cognition can be used effectively to integrate ESD and DE into post-primary education to develop an activism-orientation in students. It begins by looking at the factors that contribute to activism/behaviour change in sustainable development issues and identifies the importance of self-determination theory (SDT) and internalisation in explaining sustainable changes in behaviour. Secondly, the article outlines the ways in which DE, ESD and situated cognition are aligned, with reference to the importance of SDT within each. The third section describes and analyses three situated cognition methodologies with applied examples from the RCE-Ireland flagship project on activism and ESD. Finally, the article outlines the main advantages of situated cognition used with DE and ESD, with a call for further research to be carried out in order to integrate them fully into the Irish education system.

Activism towards sustainable development

Any cursory analysis of government policy on sustainable development will demonstrate the belief that there are two main methods to encourage behavioural change in society: making laws and providing information. However, mainstream psychological evidence indicates that sanctioning systems (e.g. making laws and imposing taxes) are effective in the short-term, but are unlikely to create sufficient behavioural change in people towards sustainability (Osbaldiston & Sheldon, 2002). Instead, they can produce the opposite effect of ‘punishment avoidance’ behaviours (e.g. introduction of a bin charge can lead to roadside dumping) (Lindenberg & Siegwart, 2007) and result in people thinking they have a ‘right’ to pollute, having paid a tax/charge (Kopelman, et al., 2002). Providing information on sustainable development issues will also not cause sufficient change in people’s actions, because this information may clash with previously held lifestyle beliefs and practices (Gladwin, et al., 1997). Another factor could be an uneven distribution of information between those media messages promoting universal over-consumption, and the smaller quantities of media and information campaigns promoting sustainability.

To better understand how to bring about lasting behavioural change towards more sustainable lifestyles, we must look at the factors that influence how people make moral choices. Despite the traditional view of human motivation for taking action, dominated by ‘rational economic choice’ (Miller, 1999), there is evidence that situational factors, such as the existence of supports and incentives to make sustainable development choices (e.g. availability of Fairtrade products in stores), social contexts and people’s own social value orientations (SVO) (competitive, co-operative or individualistic orientations), have substantial influence on how people respond to social dilemmas (Osbaldiston & Sheldon, 2002; Komorita & Parks, 1995).

So what tools, other than legislation, taxation and information, can we employ to create lasting behavioural change? Hines, Hungerford and Tomera (1986) have categorised non-coercive techniques for producing environmental behaviours (and this model is applicable, by extension, to pro-development decisions also). Their model, like that of Osbaldiston and Sheldon above, points to three variables by which people are influenced: situational factors; knowledge and ability factors (e.g. knowing about energy saving and how to do it); and intrapersonal factors (e.g. attitudes, values and acceptance of responsibility). The two former factors tend to emerge from institutional

initiatives (e.g. availability of public transport, information/education campaigns). Although the increase of social and institutional supports is a significant step, these alone cannot secure rapid enough change towards more sustainable behaviour. The intrapersonal factor must also be dealt with to facilitate changes in attitudes and values for lasting behavioural change.

How can we therefore assist changes in attitudes and values for sustainable behaviour? Deci and Ryan (1987; 2000) investigated techniques where one person can help to motivate another to not only take on, but also internalise, new behaviours. From these studies they developed their self-determination theory (SDT) which theorises that motivation exists along a continuous range starting from a sense of being controlled by others or a situation (external motivation), to a sense of being autonomous or self-determining (internal motivation). They proposed three psychological needs that motivate a person to initiate behaviour and specify needs that are necessary for the psychological health and well being of an individual. The three main needs are for competence, autonomy and relatedness:

- Need for competence: the need to experience oneself as capable and competent in controlling the environment and being able to predict outcomes;
- Need for autonomy (or self-determination): the need to participate in determining one's own behaviour. The need to experience one's actions as a result of autonomous choice without external interference; and
- Need for relatedness: the need to care for and be related to others; to experience authentic relatedness from others and to experience satisfaction in participation and involvement with the social world.

Hence, if one can satisfy these needs the probability of creating lasting behavioural change is greatly increased.

In summary, recognising the possibilities and limits of punitive measures and information campaigns highlights the need for a deeper process of engagement with people's intrapersonal factors, towards internalisation of sustainable development values and beliefs as SDT indicates. Deci and Ryan argue that autonomy-supportive teaching in education is highly effective in increasing internal motivation in students (2002:183-203). This could be

achieved by using situated cognition and SDT within education for sustainable development.

Situated cognition and self-determination theory

“Tell me, and I will forget.
Show me, and I may remember.
Involve me, and I will understand” (Confucius, 450 B.C).

Relatively recent educational research is bringing to light what has been practiced by many throughout recorded history about how people learn best. The quote above, attributed to Confucius, captures the essence of situated cognition, whereby hands-on experience is crucial for deep learning. ‘Activities, tasks, functions and understanding do not exist in isolation; they are part of broader systems of relations in which they have meaning’ (Lave & Wenger, 1991:53). Consequently, people require hands-on learning with multiple senses to increase their metacognitive skills which facilitate understanding by the learning of how their own learning and thinking is taking place.

Developments in educational psychology over the past two decades in the areas of situated cognition (Lave & Wenger, 1991; Bredo, 1994) have shown that for most people, learning is not readily turned into abstract rules or practices that can easily be transferred from one context to another. This means that learning is primarily situated in a context, and people engage in activities they have learned in relation to specific contexts, and not in abstract terms. At the same time, and given that transferability of what has been learned to new contexts is often a key learning goal, the development of metacognitive capacities is crucial given the role metacognition plays in enabling transfer ([US] National Research Council, 2000).

Situated cognition research has looked at how people learn in day-to-day life, such as in apprenticeship situations (Lave & Wenger, 1991). This research also highlighted that learning in the wider world is a social process, often involving engagement in a community of learners, dealing with real-life tasks, in which learners collaboratively solve problems of increasing complexity.

Applying the three main needs identified previously by SDT, we can better explain how situated cognition can increase the likelihood of lasting behavioural change. The need for competence is addressed as learners are taught to critically think in real-world situations. The need for autonomy fits

within the learner's active participation, and the need for relatedness corresponds to group work, and the community of learners emphasised in situated cognition. These links will become more evident when the three methodologies are discussed later.

Learning about community and learning in communities

What do development education/education for sustainable development and situated cognition have in common? First, let's consider the characteristics of DE/ ESD:

- They focus on the development of critical thinking, and on systemic thinking (United Nations Economic Commission for Europe, 2005; Hogan & Tormey, 2008);
- They contain an ethical dimension (United Nations Economic Commission for Europe, 2005; Osbaldiston & Sheldon, 2002);
- They are contextual, with a focus on the 'experience of life and work beyond the classroom' (United Nations Economic Commission for Europe, 2005:paragraph 24);
- They have a strong focus on the use of participatory and learner-centred active learning methodologies (Freire, 1971; United Nations Economic Commission for Europe, 2005; Hogan and Tormey, 2008).

The core idea in situated cognition is that learning and knowledge acquisition best occurs in context and is significantly enhanced through social interaction. DE and ESD also look to equip learners with the relevant social skills needed to work together (in 'communities of practice') towards creating a more socially and environmentally equitable world (Osler, 1994). DE and ESD emphasise teaching skills such as team work, critical thinking, and problem-solving as well as imparting values such as respect, empathy, responsibility, and solidarity for oneself and others, (Irish Aid, 1999). The situated cognition concept that knowledge is not owned by one individual but belongs to a group strongly links with these DE and ESD values.

So what can situated cognition bring to DE and ESD? DE and ESD subscribe to the motto of 'the medium is the message' thereby engaging participants in educational activities that reflect the skills, behaviours and values being taught. (e.g. role-playing, case-studies, interactive games, etc). However

stimulating and engaging for the learners, these activities sometimes lack practical tasks associated with situated cognition which can help to tie them into the action-dimension of DE and ESD. Consequently, situated cognition can enhance DE and ESD skills to organise in groups and take action together, towards long-term behavioural change.

Three situated cognition methodologies

Cognitive apprenticeship: Making thinking visible

Brown, et al. developed cognitive apprenticeship as a teaching methodology to facilitate situated cognition in the classroom environment. Cognitive apprenticeship strives to make the thinking of a teacher/expert learner visible to other learners to facilitate similar learning, even when tasks are not physically visible, such as furniture making. Expert learners (i.e. teachers or more advanced peers) speak aloud strategies they use to tackle a particular task (Brown, et al., 1989).

Cognitive apprenticeship also attempts to situate abstract tasks of the school curriculum in contexts that make sense to students so it can help them to understand the reasons for the learning taking place, and motivate them by seeing the overall model of the 'finished product' of their learning (Collins, et al., 1991).

Furthermore, cognitive apprenticeship incorporates the need for skills transfer in the school environment. The idea is 'to present a range of tasks, varying from systematic to diverse, and to encourage students to reflect on and articulate the elements that are common across tasks' (Collins, et al., 1991). In this way, students can learn to generalise skills, and to transfer them independently where appropriate.

An example of a cognitive apprenticeship strategy is reciprocal teaching developed by Palinscar and Brown, (1984). Their method centres on modelling, coaching and fading tasks being taught. Reciprocity is about the teacher/expert student and students alternating in the role of the 'expert'. Reciprocal teaching enables the more expert students to develop a greater metacognitive understanding of their own expertise and so acquire deeper learning.

Cognitive apprenticeship can also be seen as an overarching learning methodology which can be included within other situated learning methodologies.

Knowledge building

Knowledge building theory was created and developed by Carl Bereiter and Marlene Scardamalia. They make a distinction between learning and knowledge building (KB). They see learning as an internal, (almost) unobservable process that results in changes of beliefs, attitudes, or skills. In contrast, KB is seen as creating or transforming public knowledge through means that can increase community achievements accomplished together, these being greater than the sum of individual contributions. 'People are not honoured for what is in their minds but for the contributions they make to the organisations' or the community's knowledge' (Scardamalia & Bereiter, 2006).

KB theory sees students not as learners but as 'members of a knowledge building community' (Scardamalia & Bereiter, 2006). It encourages students to build extensive webs of understanding alone or in collaborative groups (Bereiter & Scardamalia, 2003). 'It allows learners to see knowledge advancement as a community rather than individual achievement, as idea improvement instead of progress towards true belief, and discourse as collaborative problem solving rather than argumentation' (Scardamalia & Bereiter, 2006). A practical example of this in the real world could be open source software, and the idea of copyleft (sharing information for non-profit) rather than copyright or patenting of information, thereby restricting people's access to it for financial gain.

By using mind maps, group diaries (written or audio) or other forms of documenting the learning process, a student or group has a physical tool which allows them to reflect on their learning process and therefore better understand how knowledge is constructed.

As with cognitive apprenticeship, the characteristics and principles of KB, DE and ESD, such as co-operation and critical thinking, also correlate strongly. This makes it a very appropriate learning methodology, as it reinforces similar DE/ESD values. KB can create a platform for learners to engage as equals and as part of a wider group striving towards knowledge creation for sustainable development.

Problem-based learning

Problem-based learning (PBL) is a methodology which involves using complex real-life problems and situations as a basis for presenting a problem/task to learners, thereby allowing learners to acquire particular skills and knowledge. It encourages the growth of student responsibility, initiative, decision-making and

intentional learning. It promotes collaboration among students and teachers. It utilises dynamic, interdisciplinary, generative learning activities that promote higher-order thinking processes to help students develop rich and complex knowledge structures; and assess student progress in content and learning-to-learn within authentic contexts (Grabinger, et al., 1997). PBL has three basic characteristics: problem-solving in ‘real-world’ contexts; self-directed learning; and group work.

PBL is usually organised in small groups of learners, accompanied by a facilitator. A series of problems are provided to the learners by the facilitator, with more facilitator guidance at the beginning through introductory problems, and later phased out as learner expertise increases. In PBL, ‘solving the problem is part of the process, but the focus is on problem management, not on a clear and bounded solution’. Students work out their own learning requirements, and even though the problem scenarios may be chosen by the teacher/facilitator, the students define how and what they learn (Savi-Baden, 2003).

PBL is already used to a certain extent in DE and ESD through the use of case studies and project-based work. However, a better structuring of PBL projects to be more student-centred and reflective on the learning process to enhance transferability of the skills acquired would ensure a more in-depth understanding of sustainable development issues.

To summarise the three methodologies discussed, their common features include co-operative group-work, metacognitive skills development, student-led learning and the teacher in a facilitator role. Cognitive apprenticeship is most useful when teaching a new skill or concept to learners. Knowledge building helps to visualise the learning process for the learners, and enhances their perceptions of knowledge as communal: managed, advanced and owned by their community of learners, who in turn are part of wider communities. Lastly problem-based learning can be used as the main framework into which cognitive apprenticeship and KB can be embedded and utilised together to best deliver DE and ESD in the classroom.

Examples of situated cognition methodologies utilised in DE and ESD

In an action research project conducted by RCE-Ireland, post-primary teachers were asked to use the three situated learning methodologies in their classrooms over a 10-week period. The research specifically looked at increasing activism

among post-primary students by embedding DE and ESD into the curriculum through key skills and situated cognition (NCCA, 2008). The project was conducted with eight teachers in the Limerick region. The following are two practical examples of how the teachers applied the situated learning methodologies with DE and ESD.

A 5th year Leaving Certificate Applied (LCA) Spanish teacher took a problem-based learning approach. She gave the class examples of information on the social, environmental and economic impacts of cobalt mining in the Congo and its links to the international mobile phone industry. This was placed on posters around the classroom. Dividing the class into groups, she gave them particular question sheets for each group to complete together from the posters, to gain an understanding of the topic. The class then discussed the issue together. By looking at and debating the real-life situation of mining in the Congo with its advantages and disadvantages locally and abroad from an environmental, social and economic perspective, the students were able to grasp some of the complex real-life dilemmas from which they were asked to seek solutions in which they could partake.

The task of the groups was then to decide on an activism project they could carry out at school to tackle the impact of the cobalt industry in the Congo. The groups discussed, planned and organised themselves with support from their teacher. Some groups decided to obtain mobile phone recycle bins for their school, while others organised a publicity campaign to be used in the school. Another feature of these projects was the use of mind maps (knowledge building) on a wall of the classroom, whereby weekly updates of information gathered was compiled by the groups. This allowed a visual record of the class learning and project progression. Each group gave a final presentation of their part of the action project to the class.

Another teacher carried out some DE and ESD activities with her class (a wealth distribution activity and an ecological footprint activity) to introduce the concepts and initiate discussion on DE/ESD and its link with her subject, physics. She then asked each student to write a short essay on how physics can affect the environment and people. She grouped the class under common essay themes and told the groups to further research their topics with the final purpose of carrying out an activism project and co-presenting it at the end to the class. This was mostly a PBL approach. A mind map was created on the class wall which each group added to regularly. Through active discussions, each group debated and planned their project and were allocated tasks with guidance

and support from their teacher. These were important KB activities. Students carried out projects on subjects including radiation, recycling and renewable energy. Some carried out action projects such as building a model wind turbine, or contacting charities for more information about their topics (radiation and the weapons industry, global warming and developing countries, etc.).

These two examples clearly illustrate the possibility of using situated cognition methodologies effectively and in tandem, to carry out ESD and DE activities in the classroom.

Qualitative data review: Teacher and student interviews

At the end of the ten-week period, interviews were carried out with both teachers and students. The interview format was semi-structured and recorded. Teachers were interviewed individually, while students were interviewed in focus groups of approximately four-five students. The student groups were comprised of both volunteers and students chosen by their teachers. From the interview transcripts certain common factors emerged among teachers and students, which were then categorised under four main headings: structural; operational; learning experience; and action-orientation of participants. Below each factor is discussed in greater depth, with reference to sample quotations from the interview transcripts.

Structural factors

Most teachers and students identified various structural factors that affected their interaction with the action research project, mostly focused on the limited time of the project. The delivery time of the project was often identified as being too short, as well as quite sporadic for many teachers and students. Transition year teachers (TYs) especially found that work experience and other extra-curricular activities in which TYs engage in limited their contact hours and made for discontinuous teaching periods. This made it harder to re-engage the students in the DE/ESD topics being covered and their activism projects when sometimes class had not convened for weeks at a time.

Some teachers found that preparation time for classes was lacking given that this was a substantially new departure for many teachers. Some teachers were familiar with sustainable development themes, but not with interactive situated learning methodologies, and vice versa. Even though sample teaching materials were provided for all the teachers, some identified the need for more support materials; however a few enjoyed the freedom of being able to

create their own materials during the course of the project and fine-tune them to the needs of their particular class, subject and personal interests with sustainable development.

Curriculum and exam pressures were identified by all as limiting factors, which should be considered when introducing any new element into a classroom as the curriculum and exams do not value and examine these new methodologies. These are structural factors commonly recognised as restrictive when introducing new teaching styles into the post-primary curriculum. In the Report on The National Education Convention (1994), it was recognised that examination formats ‘are neglecting areas and approaches...including active learning and student activity’. In the teacher interviews, a TY history teacher stated the following:

“The exams do act as barriers. You have to be focused in on that. At the end of the day, schools and parents want results”.

One last important structural factor identified was the possible impression that the different class format could have on other teachers if observed in passing without being fully aware of the situated learning techniques. This teacher felt that because group work naturally means a higher level of verbal interaction between students during class time, a colleague may consider this extra noise level an indication of the teacher’s inability to control her class. However, despite this drawback, the teacher was very interested in trying situated learning approaches with her students the following year.

In general we can say that the structural factors identified above were predictable as they are regularly identified impediments in the mainstream education system when attempting to introduce changes. An over-loaded curriculum and assessment methods were identified by the NCCA as impediments to introducing key skills changes into the post-primary cycle (National Council for Curriculum and Assessment, 2003).

Operational factors

The second main group of factors identified in the interviews were operational in nature. Students noted some difficulty in researching certain data for their project, citing a lack of relevant data available online for Ireland on certain topics, such as climate change statistics. The internet was the main source of information for most students, yet there was little criteria observed in terms of

the validity of information sources. Research skills were therefore somewhat lacking, and students could have benefited from more guidance in this.

Another unforeseen weak area for students was related to presentation skills. Although it was not necessary for student groups delivering activism projects to present their completed work, most teachers opted for this approach. However, teachers were quite surprised to find that even the older classes (5th and 6th years) lacked in confidence and basic presentation skills to accomplish this task. Some teachers presumed that seemingly expressive outspoken students were confident enough to give presentations, but found their students very much worried about having to present to their peers. A 5th year LCA Spanish teacher said the following:

“They got very nervous at the end at presenting their own topics...it was a massive panic attack...We presumed they were more advanced than they were and they need more structure with this. That was our fault, not theirs”.

Finally, skills for working effectively in groups were also identified by both students and teachers as lacking. Although teachers did support the group work as needed, some basic skills and guidelines could probably have been imparted to anticipate certain situations and be aware of possible group dynamics, particularly as very few students had previously participated in any kind of group work at school. All of the teachers recognised the need for more time than usually allotted for the delivery of group work.

Learning experience

The learning experience of the students as noted by both themselves and their teachers was very positive, despite the restricting factors mentioned above. In general, there was an increased interest and motivation among students towards sustainability issues, which included some students who normally do not engage much in class discussion.

“The only thing that surprised me was that some people who usually do nothing, in the groups excelled more than usual. It was great. Obviously it’s the type of learning they like to do...I think it’s a mix of both the topics and the group work” (5th year LCA Spanish teacher).

It seems that the students’ response to group work was significant and productive. Many students expressed their preference for group work over

working individually, due to added active discussion on topics of interest. One 1st year CSPE student stated that the class was ‘more relaxed, easier...You get into groups and talk with your friends. Your teacher actually talks to you about the world and stuff and what’s going on’.

This naturally leads us into the next factor: interactive situated learning methodologies. Most students enjoyed the experience of working in groups, engaging more with situated interactive activities and recognising their practical relevance and value while integrating sustainable development topics with group work, into the subject area. For example, a 5th Year LCA Maths student said ‘We got a break from doing maths, but it was maths as well. We weren’t writing down stuff. It was active like. We got to do it with poker chips and using cards’.

Lastly, the response to democratic education was favourable and added to their level of interest in their projects. Some teachers let the students pick their project topics, and pick their own groups. Others drew names from a hat, or formed groups depending on topic interests among students. A 5th LCA Spanish teacher stated the following: “They love being active. Being involved in the decision-making process was good”.

Action-orientation

In terms of seeing a change of motivation in the participants towards increased activism, the qualitative data showed a reasonably positive response from many students who openly identified with their particular project themes and how they were thinking more about it, and taking steps towards more sustainable living. The knock-on effects of influencing their parents with their new-found knowledge were also noted. Two students offered the following statements in the group interviews:

“Yeah...Fairtrade products... If I saw a bar I’d probably buy it. My mother buys the coffee or the tea. She didn’t buy it before” (1st year CSPE student).

“We didn’t know what the phone bins were about till the man came in to talk to us and since then there’s loads of phones in the bins” (5th year LCA mathematics student).

Conclusions

This paper has outlined how situated cognition can enhance the experience of DE and ESD by creating deeper learning, engaging participants in more real-world action tasks, making certain complex concepts more accessible through cognitive apprenticeship techniques and by expanding DE and ESD values further into the teaching methods themselves.

From the qualitative data obtained we can see some important insights into particular factors which enhanced and impeded students and teachers during the intervention. Obviously, we must consider that the qualitative focus groups are not the majority of the students, though it did include all teachers. However, due to common issues arising from different student focus groups, we can conclude there is reasonable validity in the factors identified. The operational factors identified are probably the easiest to overcome, were this intervention to run again. The structural factors however, require changes in the post-primary school structures which are beyond the scope of this intervention. The positive learning experiences and positive change in action-orientation among students points toward the important benefits that integrating such DE/ESD topics and methodologies would have at post-primary level.

In conclusion, the case for using situated cognition to integrate DE/ESD into mainstream education is strong for both educational and personal development benefits of the learners, but also from evidence-based research in self-determination theory which indicates high probabilities of creating long-term behavioural changes in learners. There is an opportunity to further develop this proposal with more thorough action research, with a long-term view of integrating these methodologies into the mainstream curriculum.

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