

Forward Thinking: A Teaching Project

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Abstract:

The aim of this paper is to explain a project that we are undertaking at the University of Ulster in Northern Ireland as part of our on going commitment to Science and Society. We are building a program of community engagement by offering in school “Forward Thinking” sessions for 14 year olds. The sessions focus on topics in bioethics, and aim to engage the students in consideration of both the ethical and scientific issues at stake for example in cloning, genetic modification, human enhancement, humanities interaction with their environment etc. This project is based around a slightly modified version of the community of inquiry (Also known as Philosophy for Children) teaching methodology developed by Professor Matthew Lipman. This methodology aims to engage the participants, both teacher and students in collaborating with each other to grow in understanding of the world around them, forming a community of inquiry. The community of inquiry model has been shown to be very effective at engaging students in learning and exploring ideas, improving critical thinking skills, affective skills and collaborative skills. In the paper I will discuss both the project, the methodology we are using and why we have adopted this methodology.

Community of inquiry methodology:

A community of inquiry is simply a group who are focused on solving the same problem through reasoning together collaboratively.

The essence of this activity is built around a slightly modified version of the community of inquiry (Also known as Philosophy for Children) teaching methodology developed by Professor Matthew Lipman.¹ This methodology aims to engage the participants, both teacher and students in collaborating with each other to grow in understanding of the world around them, forming a community of inquiry.

The community of inquiry model has been shown to be very effective at engaging students in learning and exploring ideas, improving critical thinking skills, affective skills and collaborative skills.²

The community is developed by engaging a group of students in regular, student driven inquiry into discussion of common, central and contestable concepts. Each of these elements generates student engagement making it their community of inquiry.

This is done by providing some stimulus material (A talk, book, news article, video, anything which can be used to generate questions), getting the students to generate questions from this source material and then organizing these questions.³ And finally selecting and discussing one of the questions.

At the end of the session it is usual to summarize where the discussion has gone, and what future direction the group might want to explore.

The role of the facilitator:

The community of inquiry flourishes only when certain preconditions are met:

1. Readiness to reason;
2. Mutual respect (of children towards each other, and of children and teachers towards one another);
3. An absence of indoctrination.

And it is the facilitator's role to provide this environment.⁴

The facilitator mediates the discussion and encourages both rigorous thinking and collaborative thinking by the use of modeling and procedural questions (Such as, can a distinction be made here? Can anyone think of another explanation of that? etc). Importantly they do not drive the discussion with substantive inputs, instead they create an environment where the participants generate the substantive inputs themselves. Students are engaged because it is their questions which are being addressed, and because the topics are important to them, they are engaged in the intellectual process of trying to discover the right answer.

The facilitator helps the students to develop skills by using procedural questions that reflect critical thinking skills (E.G. "Could that be clarified?", "Can anyone think of a counter example" etc) which develops these skills in the students both by modeling them, but also by demonstrating how they are useful in getting what the students want, answers to questions that are important to them.

By ensuring the discussion is rigorous and well focused the facilitator imparts skills and avoids students getting frustrated with a pointless discussion which comes to no conclusions.

As the community matures the facilitator becomes less important since as the participants internalize the critical thinking skills modeled by the facilitator they will come to ask procedural questions removing the need for the facilitator's intervention.

In many senses the community of inquiry pedagogy subverts the typical student-teacher relationship shifting the role of the teacher from the font and giver of all knowledge to a co-explorer discovering knowledge and exploring ideas alongside the students.

Benefits of the community of inquiry:

The major strength of the community of inquiry methodology is the level of engagement it generates. Done right, it becomes clear to the participants that they are in control, and they can direct the questions, which generates a huge level of buy in from students who presently are used to just being told what to do in schools. To give an example while in New Zealand over the course of 4 years I developed a program of philosophy for children at Epsom Girls Grammar School. While being more general in focus than this activity is intended to be, this was highly successful, with student demand being such that while in

the first year there was just one class of 20 students, by the fourth year we had 5 classes of 30+ students running. This was driven purely by word of mouth among the students.

When the community of inquiry was first developed it was primarily aimed at developing critical thinking skills, and there is solid evidence that it is a very effective means of doing this.⁵

The process of the community of inquiry itself engenders affective and collaborative skills and attitudes, since the participants are engaged in thinking together, and if they want their view to be respected, they will learn that they need to respect other view points. Furthermore they will discover that respecting another view point doesn't just mean waiting their turn to express their view, but to engage with that view, and challenge it to discover just how robust it is.⁶

Finally, and most important, implicitly the community of inquiry model encourages thinking as a means of problem solving and in particular collaborative thinking.

The disadvantages of the community of enquiry model:

It is often hard for lecturers, teachers and tutors, even good ones, to adopt this model because the way they need to behave to facilitate its success will usually go precisely against their instincts. So for example rather than answering students questions these often should be left for the other students to answer. Another particularly frustrating case is when you feel the inquiry is heading the wrong way, instead of adding a substantive comment as you would in a normal classroom to steer the conversation back to the 'correct' path you have to trust the class to spot the problem that is irking you and to do the steering themselves.⁷

The community of inquiry model cannot be used if you are wishing to ensure that the students will believe a particular thing. So for example in teaching about ethics to professionals you will often have several goals such as raising ethical awareness, improving critical thinking skills etc which are perfectly compatible with the community of inquiry. However other goals of professional teaching like students having specific knowledge sets for exam purposes or a belief in certain professional codes are incompatible with the community of inquiry, its student driven nature makes it an unreliable tool in these regards.

Forward Thinking project:

We believe that people in general and in particular children are getting increasingly out of touch with the end products of science, the ways those products are generated and the social and ethical implications of science.

In the Forward Thinking project we intend to harness the community of inquiry methodology to interest children (Key stage 3) in the engagement with and discussion of contested scientific ideas and techniques such as the use of stem cells, cloning, genetic modification, human enhancement etc. In essence we want to harness a teaching methodology which has been shown to be effective in other areas, and apply this to

developing in children the skills and knowledge necessary to engage with the social and ethical implications of bioscience.

To do this we intend to develop brief stimulus materials which explain the actual science behind these contested notions. These will draw heavily on the Science and Society website⁸ that we have developed at the University of Ulster and other online resources such as the Bioethics Education Project.⁹ We will also develop a body of predicted directions and discussion points to support the facilitators in their role along with a set of skill development activities.

Initially we will focus on four topics, cloning, xenotransplantation, human enhancement and global warming. We think these four topics cover a wide range of questions and opportunities to stimulate thinking about the social and ethical implications of science. However part of the project will be the development of further topics to support teachers who adopt this methodology.

We aim to do more than just stimulate debate, we aim to inform the debate with access to succinct but precise information on the latest state of play in regards to the science involved in these advances.

In particular though we aim to encourage a general attitude towards thinking about these issues, where it is acknowledged both that an access to the facts surrounding the science is crucial and that the best way to think about these issues is collaboratively.

The methodology that we are intending to use enables us to achieve this in two ways. Firstly, by its own nature the community of inquiry model resists the teacher trying to direct or shape the discussion, communities of inquiry function well when they are student, not teacher driven.¹⁰ Secondly, the community of inquiry does implicitly model certain social norms, such as engaging with ideas rather than people, listening closely and respecting others ideas. It is hoped that these social norms will shape the engagement of the pupils so that they learn to think collaboratively.

To do this each year we will offer ten Northern Ireland schools the chance to have 8 sessions of Forward Thinking material taught for them, by our trained facilitator. (Two on each topic) These sessions will cover learning objectives both within the citizenship curriculum and the science curriculum and it is anticipated that the sessions will be spread throughout the year in two session blocks. The standard teachers for these times will be asked to attend, and if they are interested then we will provide training in this methodology for them to implement in the following year.¹¹ The groups are anticipated to contain 26 children, the normal amount for a Northern Ireland class.

Each of these sessions will be followed up by a discussion online involving all of the Forward Thinking groups in all the schools. This will be supported by C2K, an online learning environment connecting all of the Northern Ireland schools. The C2K service now provides 40,000 Internet ready computers to 330,000 students and 20,000 teachers in NI schools. This level of interconnectedness is presently only available in Northern

Ireland.¹² This online discussion will be stimulated and informed by summaries of the students own discussions produced by the facilitator using Free Mind, a free mind mapping software. Our facilitator will serve as a moderator and prompter for the discussion boards and it is hoped that these will enable the students to continue to engage and discuss topics they are interested in throughout the year. Finally the boards will facilitate cross community engagement.

At the end of the year the students will be given Forward Thinking certificates, and asked if they, in small groups, want to participate in the Forward Thinking competition. This will require the group to create a presentation which critically engage with a piece of public policy and suggests modifications. The best three of which will be presented at the Forward Thinking congress, an event where all the students, their parents, and the Minister of Science for Northern Ireland will be invited to attend.

The next year, the same pattern will be repeated at different schools.

To deliver these initial sessions, develop the stimulus materials, predicted directions and discussion points we intend to employ a post doctoral student, with a bioethics background and preferably training or experience in working with children. This person will collaborate with myself on the development of the materials, do most of the initial delivery of the material, and ultimately, with me, be responsible for training further volunteers in the delivery of the material. To ensure that they are able to use the methodology appropriately they will be trained by SAPERE, the coordinating body for Philosophy for Children in the UK. Likewise before they are involved in training others to deliver the Forward Thinking sessions, they will be trained by SAPERE to do this.

We are hoping also to have set up the project to be self sustainable aiming to have at least 15 teachers trained in this methodology and hopefully some of them trained to teach others as well. All the material generated will be freely available from our website to support these teachers.

Sample topics to be developed:

Neuroscience and Neuroethics
Implantable drug dispensers and mood control
Stem Cells
Genetic Modification
Genetically Modified Foods
IVF
Pre-implantation diagnostics
Genetic Screening
Genetic Testing
Human/Machine Interface
Nanotechnology
The Nature of Science
The Nature of Scientific Knowledge
The relationship between Science and Religion

Genetics, Neuroscience and Free Will

Environmental justice and global citizenship?

You may now be wondering what did all that have to do with environmental justice and global citizenship?

Well, one of the hopes of the project is that by both engaging school children in talking and thinking about the ethical and social implications of advances in the biosciences we will also get them engaged and interested in being socially responsible citizens. The topics we have chosen are intended to stimulate considerations about responsibilities to others, and global responsibilities. It is hoped that imparting critical thinking skills and a wider interest in these issues will lead the students onto further consideration of the problems that are facing us all.

¹ For further information see Lipman, M., Sharp, A. M. & Oscanyan, F. S. *Philosophy in the Classroom*. Philadelphia, PA, Temple University Press, 1980. and Lipman, M. *Thinking in Education*. Cambridge: Cambridge University Press, 1991.

² Pardales, M & Girod, M. Community of Inquiry: Its past and present future. *Educational Philosophy and Theory*, Vol. 38, No.3. 2006, 299-309. See also Sprod, T. Improving Scientific Reasoning through Philosophy for Children: an Empirical Study. *Thinking*, vol. 13, no. 2. 1997.

³ It is often a good idea to allow the students to organize the questions. This also allows further critical thinking skills development, either by directing organization towards some end i.e. find the question which needs to be solved before the other questions can be sensibly addressed or by allow free organization of the questions by the students but requiring them to explain their organization and reorganization when they are finished.

⁴ Lipman, M., Sharp, A. M. & Oscanyan, F. S. p. 45.

⁵ See for example Shipman, V. Evaluation Replication of the Philosophy for Children Program - Final Report. *Thinking* Vo. 5 no. 1, 45-57, 1983. Data was obtained on Questioning Task 4, a test designed to assess the thinking skills taught in the P4C program, for approximately 2,200 5th through 7th grade students in New Jersey. Despite differences in the extent of teachers' understanding and implementation of the P4C program, and in students' background characteristics and abilities, the data from this large diverse sample of New Jersey school systems and students indicated that even after adjusting for initial relevant group differences, students in program classes were superior to their non-program peers in formal and informal reasoning skills.

⁶ See for example Gardner, S. Participation in a "Community of Inquiry" Nourishes Participants Perspective-Taking Capacity: A Report of an Two Year Empirical Study. in Palsson, H, Sigurdardottir, B, Nelson, Y b. *Philosophy for Children on Top of the World*. Akureyri: Univ. Akureyri. 1999.

⁷ Indeed strategies of successful teachers such as humour can sometimes be counterproductive in the community of inquiry context, since humour is really just a tool to gain engagement, which should be provided by the method itself in the community of inquiry.

⁸ <http://www.ulster.ac.uk/scienceinsociety/> (Accessed 09/06/06)

⁹ <http://www.beep.ac.uk/content/15.0.html> (Accessed 09/06/06)

¹⁰ Gardner, S. (1996). Inquiry is no mere conversation. *Critical & Creative Thinking* 16.2, 41- 49.

¹¹ This will be done in collaboration with SAPERE, the coordinating body for Philosophy for Children in the UK. <http://sapere.org.uk/> (Accessed 09/06/06)

¹² <http://www.c2kni.org.uk/corp/corporate.htm>. (Accessed 09/06/06)