

## **Learning science through philosophical dialogues**

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**How to stimulate pupils' interest for, and ability to understand, science? In Norway philosophical dialogues have recently been introduced into the national curriculum as a pedagogical methodology for learning science. It is being assumed that participating in philosophical dialogues will give the pupils perspectives on the foundation of scientific questions, and show them how such questions systematically can be elaborated. In this article I present some perspectives on how pupils can be introduced to philosophical methodology through facilitated philosophical dialogues, and thereby be given a cognitive tool for elaborating scientific issues. We will also give some perspectives on how this can be relevant not only for their future school-performance and general ability to learn, but also prepare them for their civil life.**

The first known facilitator of philosophical dialogues is Socrates, as described in the writings of Plato. One interesting feature with the role Socrates takes in the dialogues is that he consequently doesn't promote his own views, but only asks elaborating questions. In this way he facilitates the thinking of the other. Philosophy is not about knowledge as such, but the ability to search for knowledge through logical thinking. This is an ability we all possess, which makes everyone capable of participation in philosophical dialogues. Socrates proves this in «Menon» by having a philosophical dialogue with a young slave (Plato 1985).

Today various forms of facilitating philosophical dialogues in groups are practised all over the world as part of the tradition called «Philosophy for Children» (P4C). Philosophical dialogues can be facilitated in a loose form, simply by keeping track of whose turn it is to talk. The content of the dialogue would basically be what makes such dialogues philosophical. Another approach would be facilitating dialogues according to philosophical methodology, as with Socrates more disciplined approach, by consequently challenging the speaker on the premises and consequences of their statements, the coherence and relevance of arguments etc. which also implies taking responsibility for the development of common understanding, by asking for clarifications and definitions, establishing structures of arguments etc. By adhering strictly to the rules of logic the facilitator should help the pupils in structuring and clarifying their opinions, make their assumptions and superstitions explicit, analyse concepts, examine the validity of a reasoning, and examine the implications of an idea and the consequences of having one idea rather than another (Brenifier 2004b). It is this form of philosophical dialogue that will be discussed in this article.

### **Is it possible to have philosophical dialogues on scientific questions?**

If the facilitator should not be seen as the one who knows the answer to the question discussed, having philosophical dialogues on scientific matters seem problematic. Scientific questions normally do have an empirically «correct» answer, which may ruin the open and wondering

atmosphere of the dialogue. For Matthew Lipman, a pioneer within P4C, one of the main intentions of philosophical dialogues with children is to let them reflect on fundamental aspects of reality and our understanding of such. But Lipman's approach to facilitating philosophical dialogues is to let the pupils discuss philosophical, and not scientific, matters. Most of the work being done within P4C follows this approach.

However, discussing philosophical issues is not irrelevant to the teaching of science. Behind scientific issues there are always more fundamental philosophical issues, which are usually what inspired people to search for answers, and thus gaining knowledge in the first place. Oscar Brenifier, a philosopher and a key figure within the P4C-movement, argues that without discussions of such issues the teaching of science seems dead and deprived of purpose. For him the key feature of philosophical dialogues is not the theme of the dialogue, but its form (Brenifier 2004a).. The existence of empirically correct answers to a question does not impede the possibility of seeking answers through reasoning.

Lipman suggests another reason for having philosophical dialogues about scientific matters. He sees a problem in science taught in schools as if knowledge were certain and unambiguous. According to him pupils don't get an integral understanding of the subjects when knowledge is divided into clearly separate disciplines, thus experiencing knowledge as fragmented and rigid. This impedes them from understanding that they can be critical to knowledge, and that they themselves can develop knowledge. Lipman believes this can lead to estrangement and an external relationship to knowledge. Therefore he believes that focus on sense and coherence is essential in a pedagogical context. Sense, is according to him something which pupils must create themselves through reflection, first of all by independent thinking, which is what pupils learn through philosophical inquiries. Coherence is established through philosophical dialogues as pupils get the opportunity to reflect on fundamental assumptions and structures of the disciplines and subjects they study. Thereby pupils get a deeper understanding of the subjects and get the possibility of seeing the connection between them (Lipman 1980).

It could be objected that pupils first have to master basic facts before being able to understand the fundamental structure of a subject, which would indicate a strong focus on drill for younger children and more room for philosophical inquiries for older children.

However, it is not obvious that drill is the only way of helping children to master the basics. Referring to Vygotsky's theory of the role of language for the intellectual development, it could be argued that drill should be supplemented with philosophical inquiries also for younger children. Recent studies stress the importance of lingual stimulation especially for the intellectual development for younger children (Imsen 2003).

According to Lipman, dialogue makes pupils think in ways they would not have been thinking all by themselves. Regular participation in philosophical inquiries trains the pupils in seeing relevant similarities, differences and connections between facts, and to define and classify (Lipman 1980). This can lay a fundament for gaining knowledge, and using this for solving actual problems.

Philosophical reflection can also evoke pupils' interest for fundamental issues of the subjects, and help them see the connection between what they learn at school and their own personal lives. In this way philosophy can contribute to the educational practice as a whole, not only as a subject amongst other subjects. In this way it functions as a pedagogical approach to teaching science. «To the extent that this is so—that the dialectical form of philosophy is identical with its pedagogy—philosophy provides a formidable model for the educational process as a whole» (Lipman 88: 34).

Through philosophical inquiries about the fundamental issues of the subjects, pupils follow the same path as the scientists who developed knowledge, from questions through reasoning to structures of knowledge. In this way pupils actively develop knowledge, they are not only exposed to ready-made answers. However, only theoretical knowledge can be developed through philosophical dialogues. Empirical knowledge needs to be taught in traditional ways, through

experiments, lectures and studying. This suggests a fruitful combination of philosophical inquiries and more traditional pedagogical approaches to teaching science.

### ***Preliminary dialogues***

Having an initial philosophical dialogue before presenting new information implies asking the pupils what they already know about the subject. The pupils then get an opportunity to retrieve and share information, so that they are not facing new information empty handed.

The next step could be to ask the pupils to discuss central concepts related to the topic, thus gaining a preliminary understanding of the subject matter. Through the inquiries the pupils get involved in the subject, and acquire confidence in their own competence in gaining new knowledge. Being actively engaged in research on the subject, pupils are situated as autonomous subjects in the pedagogical context.

Having discussed key-concepts increases the pupils' capacity for understanding new information. From a pedagogical point of view this is important, but equally important is helping the pupils realise what they don't know, and how this lack of knowledge limits their own thinking and acting. Without such awareness, pupils will hardly feel a need to learn, and will not be ready to involve themselves in the quest for gaining knowledge. Through critical thinking, ignorance can be brought to the surface and give the pupils an understanding of what they need to learn. Only when the pupils themselves realize their own ignorance will they feel the urge to learn (Brenifier 2004a: 39-40).

An illustration of this principle can be found in «Menon». In this dialogue Socrates poses some questions on geometry to Menon's young slave, questions the boy somewhat rashly and arrogantly answers, even though he has no special knowledge of the subject. The boy hesitates not one minute before he replies, probably convinced he knows the answer. Only when it becomes clear that these answers are wrong, and that he is ill equipped to find the right solution, does the boy begin to doubt and become humble. Socrates whole point being that as long as one is under the illusion that one knows all the answers, the desire to learn will never show itself, one goes about as if one is learned, and usually gets away with it. Indeed, only when ultimately faced with the fact that everything one thought was true is not, does a natural curiosity and thirst for knowledge awaken (Schjelderup 2006, Plato 1985).

Confronted with their own lack of knowledge pupils can be helped to formulate what it is they need to know. When they can meet new information presenting a specific problem, pupils are more easily stimulated to become actively engaged and enquiring. As John Dewey states, the intellect needs constant challenge to sharpen itself. In line with Dewey's educational theories, the teacher is able through philosophical dialogues to help pupils present problems within the reach of their capacity, and which awakens an active search for knowledge and the formulation of new thought (Dewey 1998: 96-99).

Pupils may also be encouraged to put forward hypotheses that can be tested against the information presented. The teacher can thus underline and enlarge upon points brought up by the pupils and reveal what is missing. This avails pupils of the possibility to discover the connection between their own theories and that of the information presented. Thus it becomes easier for them to discover the basic structures of knowledge. They will become less alienated towards it, and understand how they personally can contribute to the development of new knowledge.

### ***Philosophical dialogues in lieu of study***

If one first engages in a philosophical dialogue prior to presentation of new material it becomes natural to compare to what degree the information has confirmed the pupils' initial comprehension

and hypothesis or not. Should the pupils' hypothesis be shown to be faulty, then it would prove relevant and stimulating to discuss how, or why, the pupils reasoning was wrong. One can go on to expand whether pupils' conceptions of ideas and viewpoints has been changed in light of the new information.

Another natural point of departure for a philosophical dialogue on a subject is to challenge pupils to identify the main theme and concept of the subject presented. This does not only encourage pupils to identify the approach to presenting the problem under discussion, but helps them to understand the meaning of the content. A form for analysing the content denotes that a structure is established where elements are categorized under general headings in order that they can be seen in relation to the wider experience of the pupils thinking world. Discussion of main themes develops deeper comprehension. Profound reflection on general themes awakens a desire for more exact and precise idea formulation. Herewith is laid the foundation for the development of precise and nuanced concepts.

The pupils' assertions can be exposed to critical examination in the same way as was done with the main theme and its presentation. Thus highlighting and making conscious pupils relationship to their own, and to other peoples, thinking. An important part of this work will be to identify the implicit premises.

### **Identifying implicit premises**

The primary obstacle for precise and relevant thinking are unconscious premises we base our thoughts on. When premises are exposed we are freed up to explore new possibilities of thought. Let us illustrate this with an imaginary philosophical dialogue:

Child: Cars are alive!

Teacher: Why do you think cars are alive?

Child: They make noise.

Teacher: Do you think cars are alive because they make noise?

Child: Yes, birds are alive, and me too!

Here it is obvious that the premise for the child's assertion is that "everything which makes sound is alive". This is probably an assumption in accordance with the child's experience. But, as we know, the assumption is wrong and can lead to faulty conclusions. Through a philosophical dialogue, the child can be encouraged to develop a better understanding of the basic principles of life. After having made the child aware of the fact that he has a premise for his assumption and what that premise is, he can be helped to evaluate it, in order to decide whether he wants this to be a premise for his thinking. Then he needs to generalise it, and then look at it in view of relevant experience. The dialogue may thus continue like this:

Teacher: Do you believe that everything which makes noise is alive?

Child: Yes, everything which makes noise is alive.

Teacher: Is your watch alive? It makes noise.

Child: No, my watch is not alive

Teacher: Can you think of something else, other than your watch, that makes noise, but is not alive?

Child: Maybe the fridge, and my shoes!

Teacher: Do you think that everything which makes noise is alive?

Child: No, only some things.

Teacher: Are cars alive?

Child: No, only things that breathe are alive!

The teacher is aware all the time that the premise for the child's assumption is wrong. However it is essential that it is the child himself who arrives at his conclusion via logical reflection. Through logical enquiry the child becomes aware of the premises for his thinking, and what exactly each one is shown to be. By evaluating examples against the general principle that everything making noise is alive, the child comes to understand that his premise is wrong. Such bias and irrational superstitions can indeed, according to Brenifier, be exposed – an important consideration with regard to the philosophic dialogue. When opinion is exposed as untenable, the participants get bewildered and will attempt to reach a new comprehension (Brenifier 2004a). The child's final comment suggests he is trying out an alternative understanding of a phenomenon he thought he comprehended, but as he now sees he did not understand at all.

If the child continuously is being made aware of the premises for his assumptions, he will in all likelihood become aware of the fact that others also have premises for their assumptions. He can use the methodology he has experienced through philosophical dialogues as a model for how to identify such premises, and thereby evaluate arguments and take a stand on them. This can give him the opportunity to assess statements independently and thereby attain autonomy.

To illustrate this, let us imagine the child has become an adult. He hears a political remark: "The only way to curb the huge influx of asylum seekers is to instigate a stiffer asylum policy". He is then able to identify the following premises; that

- a) There is a huge number of asylum seekers entering the country, and
- b) This constitutes a problem

Thereby he has the possibility of evaluating if he is in agreement with the premises for the statement. If not in agreement, the assertion and the solution proposed, lose all relevance.

Also in everyday interaction such a skill will enable the child to become autonomous. Imagine for example, that one day his wife returns home and remarks a trifle despondently: "I know we can't afford it, but can't we eat out today? I am so tired!". He may then identify the assumptions,

- a) I'm always the one to make dinner,
- b) I don't want to make dinner, and
- c) It would be irresponsible to eat out because we can't afford it

He can also assume the following implicit premises:

- d) You take it for granted that I shall make dinner, and
- e) It is not fair that I shall always make dinner

He will then have the opportunity to make up his own mind regarding these premises. If he agrees with them, he may answer: "My dear, sit down and relax. I shall make dinner!". To avoid further frictions in his marriage, he may suggest making dinner more often in the future. Similarly, in other situations, he will be able to understand the implicit message delivered by others, and as a result react appropriately.

Skills to identify basic assumptions can be consciously developed by the teacher through implementing philosophical dialogues in his teaching. For example, when new material is presented, the teacher can ask the pupils what the basic assumptions of the presentation are, so that they can hold a critical approach to the material.

With this in mind, we can take the example of a presentation where countries are ranked according to gross national product. One of the basic premises of such a presentation is assumedly that

economy is the deciding factor for the population's standard of living. If the pupils are aware of this premise, they can form a viewpoint and examine whether or not they are in agreement. Further, they can discuss who would not be likely to be in agreement with such a perspective, for example the indigenous peoples of the rain forest, and conditions necessary for the premise to be valid, such as limited access to raw material. In this way pupils can be drawn into a critical reflection of the material. Appropriately facilitated such dialogues can come close to scientific discussions. And now instead of only having access to fully- developed concepts, the pupils will also be availed of approaches and thought processes that are the basis of the foundation of knowledge. Thus it is easier for pupils to become enthusiastic and stimulated, experiencing knowledge as meaningful and relevant. Indeed, they will also be able to form an opinion about the information presented in an independent and critical way.

Rather than learning a complete package of information, the pupils learn how to construct it. This is done based upon a model of concrete knowledge-building via co-operation between his fellow pupils and the teacher. According to Lev Vygotsky, this is how we learn- first experiencing something through social interaction, then being able to use it in our own individual lives, modelling from the first experience.

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, *between* people (*interpsychological*), and then *inside* the child (*intrapsychological*). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals.

Vygotsky 1978: 57

Philosophical dialogues give pupils a model upon which to formulate relevant questions, thus developing new knowledge based on facts and experience. Pupils are not only learning ready-made answers, but the process leading up to the formulation of these answers. They are introduced to rational thinking. When pupils do their own thinking, knowledge becomes their own. By opening up the potential to discover things themselves, the whole teaching environment becomes exciting with pupils motivated and ready to engage.

### ***Uncovering the subjects fundamental structure***

We have seen how pupils are introduced to the thought process behind the formation of knowledge in particular themes, through the use of philosophical dialogues, and thus become aware of the structural foundation of the subject. What implications can this have for teaching science?

Jerome Bruner indicates two ways in which learning serves the future. One he calls the extension of habits or associations, where after a while each new piece of knowledge is used to master a similar one. He asserts that the usefulness of this method is limited to so-called practical skills e.g. hammering in a nail with a hammer (Bruner 1977).

The other he calls the transfer of principals and attitudes. By learning a general principle one is able at a later date to recognise problems as particular expressions of the principle. According to Bruner this is indeed the very kernel of the teaching process. It is this that generates "the continual broadening and deepening of knowledge in terms of basic and general ideas" (Bruner 1977: 17). This requires that one has first mastered the basic principles of the subject (ibid).

Let us define the process of a philosophical dialogue. Let us say we have a question, e.g. "What is time?". This is a general question. The teacher can ask the pupils for suggestions regarding the answer and receive the following statements: "Time is the distance between when I began to think about the question, until I had come up with this answer". This is a specific illustration of a general principle. Through further examination of similar illustrations e.g. the distance placements in the

heavens in relation to other heavenly bodies, or the relationship between the movement of the hands of the clock etc. The group will then reach a general principle e.g. "Time is the distance between separate occurrences". Through a constant comparison between specific examples and general principles, the pupils not only grasps a more precise understanding of a fundamental principle, but also see how these principles can open up to an understanding of many different phenomena. Such discussions alternate between different ideas on different levels; the teacher should explicitly point this out to the pupils. In this way the consciousness of the pupil is awakened to the potential connection between different phenomena, the connection between differing principles and the concrete phenomena, and principles in relation to each other. This again is in line with Bruner's ideas. "The structure knowledge - the relationships and derivations that make one thought follow from another - is the proper emphasis in education" (Bruner 1962: 120).

The mastery of fundamental principles for pupils not only lays down a formulation upon which they may problem-solve, but also gives them a framework within which to absorb new knowledge. Through philosophical dialogues a network of ideas is established at different levels, bound to a series of concrete phenomena. The pupil develops an understanding of how new phenomena can be related to general principles, and how using a series of concrete phenomena it is possible to identify what they have in common, and thereby develop new general principles. One quickly learns to discern relevant factors in such a way that one is able to concentrate on central parts of the information, and thus avoid wearing oneself out on learning irrelevant details. Thus making it much easier to absorb new information adding to that which one has already learnt, and that to use it in the service of developing new principles and ultimately new knowledge. A fundamental comprehension is, according to Bruner, relevant with regards to many different fields. "The more fundamental or basic is the idea he has learned, almost by definition, the greater will be its breadth of applicability to new problems" (Bruner 1977: 18).

In the philosophical dialogue between teacher and child, it is the experience of the child that is at the root of how to define thoughts about what is alive or not. And thus the child experiences the dialogue to be relevant, and feels competent in his thinking on the subject. However it is even more important that he may reflect upon his own experience in relation to the theory he has developed directly from his own personal experience. The new experience he gains will almost certainly come to have great influence on his perception of reality. This newly acquired knowledge is indeed not just an external thing. In Jon Hellesnes words, it becomes an integrated part of the child's comprehension of reality. According to Hellesnes, it is exactly this that is lacking in traditional schools. He writes: "An education which loses sight of daily commerce, in other words with practice and policy, is an education which encourages ignorance and naivety" (Hellesnes 1992a: 84).

If all learning in school through philosophical dialogues is directly related to the pupils reality then one guards against what Hellesnes term "inauthentic education" (uegentlig danning). He finds this particularly applicable in the teaching of history. "He who understands his past as a series of external events is a schizophrenic person. A society that encourages comprehension of its history as external events and objects is a "schizophrenic society". And here we have arrived at the whole problem surrounding "inauthentic education" (Hellesnes 1992a: 88). If education in schools fails to instigate change in the pupil's awareness of himself, his society and his role in it, then it becomes questionable whether education is of any value at all to society and the individual.

It is the daily confrontation with new experiences that kicks off the child's thinking. Here we are reminded of John Dewey's theory of "learning by doing". Dewey is also concerned about history education;

A knowledge of the past and its heritage is of great significance when it enters into the present, but not otherwise. And the mistake of making the records and remains of the past the main material of education is that it cuts the vital connection of present and past, and tends to make the past a rival of the present and the present a more or less futile

imitation of the past. Under such circumstances, culture becomes an ornament and solace; a refuge and asylum. Men escape from the crudities of the present to live in its imagined refinements, instead of using what the past offers as an agency for ripening these crudities.

Dewey 1997: 75-76

To highlight this one could take the example of Hitler's Germany, or Stalin's Sovjet Union, and discuss how totalitarian regimes come into being. Pupils can be asked to identify such totalitarian tendencies in today's society and common thinking. This can alert them to their own thinking, something that could possibly prevent future catastrophes (jmf. Hannah Arendt's analyzes of the topic; Arendt 1963, Arendt 1968a, Arendt 1968b).

### ***Widening comprehension of concepts***

A deeply reflective approach towards general concepts awakens a need for more precise definitions. Thus the foundation is laid for the development of refined concepts. Concept analysis is a key tool in facilitating philosophical dialogues. This is not only of theoretical significance, but also contains significant practical implication. An example of this is the following interchange between professor and student.

Student: It is so tedious when I am not allowed to present my own opinions in this paper.

Professor: Why do you believe you may not present your own opinions in a paper?

Student: Well, I'm only allowed to refer to what others write. I'm not allowed to write what I think.

Professor: If I should present my own opinions to you, what should I do in order that you would take them seriously?

Student: Give grounds for your reasoning?

Professor: What grounds would you consider relevant if we are talking about scientific questions?

Student: Things like research, theories and scientific discussions.

Professor: So how are you going to ensure that the opinions you present in a paper will be taken seriously by the reader?

Student: Oh, well, yes then, I suppose I should present some valid scientific proof or justification.

Professor: And how should you not present your opinions in a paper?

Student: Well, I can't present just subjective opinions, I must validate what I write with references to theories, building my arguments on research and generally accepted theories.

Here the student was operating with an unclear definition of "own opinions", which made him misunderstand the scope of the task. The professor assisted him towards a more refined formulation by introducing two new and more precise definitions "subjective opinions" and "scientifically grounded argumentation". Thus the student obtains a more precise and accurate understanding of the work he has to do. And, returning to Bruner's point, he gets the potential for thinking in a more precise way about the foundation of academic pursuit.

With regard to philosophical dialogues in groups, it is even more vital that each one express themselves with precision and relevance. Unless all participants have a common understanding of the concepts and definitions that are in use, it becomes impossible to develop a precise line of argument. This is something pupils discover and learn from experience, and take into account when it is pointed out to them. As Brenifier says it is the job of philosophy to expose all that is foggy and make it clear for all to see. He argues that within the philosophical dialogue in school it is first and foremost the facilitator who must take on the responsibility for this to happen. And as such, the facilitator cannot allow vague formulations or definitions, but should pose deeply challenging questions until the participants who have presented a contribution have formulated it accurately and coherently. For example, he can enquire of the participants what exactly they mean by the terminology they are using, how they understand the relationship between different terms and concepts, and which premises lie at the root of their perspectives (Brenifier 2004a).



Through such a process the pupils will become conscious that there are different ways to understand concepts and the relationship between them. This carries the risk that they will not be understood correctly in communication with others, and conversely may not understand others correctly themselves. This in turn establishes a need for and a facility in the use of adequate and precise communication. In line with this, Brenifier says that even though, at first, the facilitator takes on sole responsibility for addressing the probing questions to the pupils, the pupils will soon claim this role for themselves (Brenifier 2004a).

The shift from imprecise to precise formulation develops the pupils' range of concepts and thus they learn to express themselves, and to think, more accurately. As Lipman says, this lays a foundation for discerning between good, stringent thinking and imprecise thinking. Via feedback from the other participants in the group, the pupils learn to systematically use these criteria in their own thinking in order to reason clearly and concisely (Lipman 1980). And thus they are enabled to identify what is unclear to them e.g. in a scientific argumentation, and ask for clarification on this.

In this way it is in the service of making themselves understood by others, and by challenging the perspectives of the others, the pupils are forced to progress towards a more refined way of thinking and expressing themselves. Lipman states that it is not the case that one first thinks, and then puts ones ideas across through dialogue. It is precisely through dialogue that we develop our reasoning and ideas. Language does not then become a tool for communicating thoughts but a tool to develop it. Socrates also refers to this phenomena ( Lipman 1988, Plato 1985, Vygotsky 1978). Erling Lars Dale gives us a closer look at this. He writes; " Thought is made conscious when it has to be formulated for others. A segment of ones own mind is revealed to the speaker" (Dale 1993: 29). When one becomes conscious of ones own thought process, one can evaluate it, and thus choose to think differently.

If children are not challenged to express themselves accurately and rationally there is a danger they will think imprecisely, and thus communicate vaguely. And, therefore, it will become difficult for them to discover the anomalies between their own and others perspectives. This gives the adults the power of definition in relation to the child. John Hellesnes aligns this to personal autonomy. He points out that sloppy, poorly defined formulations lack important contrasts, and thereby give credibility to the point of view that is attempted to be made acknowledged without discussion (Hellesnes 1992: 169). If this be the case, sloppily facilitated dialogues where each child is allowed to solely put forward his viewpoint without having it critically challenged, will not be liberating, but binding, for the children. Such an approach will tend to mask relevant difference in perspectives between the pupils, and between teacher and pupil.

The instruction gives pupils' new knowledge and insight into something that broadens their potential for thinking. However, as Jerome Bruner points out, whereas such instruction gives form and expression to our experience, it can also become the most significant tool for limiting our consciousness. He sees the recognition of alternatives as a guarantee against such constraints. Education must, therefore, not only be a process that transmit culture to us, but also ensures that contrasting viewpoints of the world come into play and strengthen our desire to explore them. He writes; " To be whole, he must create his own version of the world, using that part of his cultural heritage he has made his own through education" (Bruner 1962: 116). Therefore, according to Bruner, education should also, "seek to develop the process of intelligence so that the individual is capable of going beyond the cultural ways of his social world, able to innovate in however modest a way so that he can create an interior culture of his own" (Bruner 1962: 116).

The language spoken will decide the manner, style, and structure of thought and experience. Erling Lars Dale put forward the argument that if a definition is changed, then our observations change too, and with it our interpretation of reality. An exact use of language ensures the possibility to focus attention on important details, take them under consideration, and put them into a wider context. When pupils are able to describe, interpret, analyse and compare each individual case, they can then see the connection between action, outcome, and context (Dale 1993: 28). And in so doing

transform the potential for all they can do and be.

### ***Establishing a community of inquiry***

It is essential that through the practice of the philosophical dialogue, each individual may present his own knowledge and competence. They are thus shown to be competent, functioning subjects, not purely in a cognitive way, but also with regards to the social and emotional aspect. When pupils are given the opportunity to demonstrate their perspectives, knowledge and competence, they open up the potential to be recognized, and thereby experience themselves as competent within the group. One lays the foundation to a community of learning where it is precisely the differences between participants that brings strength to the community. If the teacher is aware of this, he will actively bring forth differences of perspective, pointing out the value of such differences to the pupils. A fellowship is then established which lays the foundation for individual action, in line with Hannah Arendt's thoughts of political action (Arendt 2002).

In the joint endeavour to develop a mutual comprehension of how to define ideas, a common world is established. A common world makes it possible to communicate – indeed the greater the degree of mutual understanding, the more concise and relevant is the communication. Hellesnes writes; “The comprehending subject tries out his comprehension on his co-subjects in such a way that the two horizons of their understanding little by little merge with each other, until both begin to understand that which they did not understand before. This is dialogue” (Hellesnes 1992a: 90).

In logic the meeting between theses and antitheses will lead to syntheses, a new insight. This advances the argument and gives it direction. In the philosophical dialogue it is exactly the contrasts in perspective that makes it possible to build up an argument, and to discover something new. It is just this that makes the dialogue motivational for the pupils. Therefore it becomes vital within the philosophical dialogue to make a point of revealing and valuing the different opinions and perspectives. This involves recognition and respect.

Hannah Arendt highlights the companionship that establishes itself through philosophical dialogues. Through dialogue a mutual understanding is established, not necessarily through agreement, but because it is the very same world and the same phenomena that reveal themselves differently to each of us, all dependent of our particular point of departure (Arendt 2002). Individual truth only comes into being, according to Arendt, through interaction with others. Via dialogue a meeting evolves between individuals where each of their separate experiences of reality is born. Through such meeting one is enabled to view the world from another's standpoint (Arendt 2002, Arendt/Berner 1992) One establishes oneself as a unique individual through interplay, simultaneously as one grows to understand the other.

A philosophical dialogue builds up via tension between the participants' similarities and differences. Similarities in the form of mutual understanding, differences in the form of experience and perspectives. Without the similarity the communication comes to a halt and becomes meaningless. Without difference there is no progress. Thus pupils are led to value each other as unique individuals whilst they are developing a mutual understanding, and improve the possibility for precise and refined communication. This establishes a community of inquiry with construction of thought and knowledge as the combining element.

### ***Differences between the role of facilitator and the role of the traditional teacher***

As Ketil Rogn comments, the role of facilitator of philosophical dialogues can be seen to stand in opposition to that of the traditional teaching one. Whereas the teacher is the one who has all the answers and shall impart them to the children, in contrast the facilitator is wondering about things and is not sure of anything. Whereas the teacher strives to interpret the statements of the pupils and

understand what they really mean, the facilitator does not understand the most obvious of statements and tediously insists on explanations. Whereas the teacher gives praise and encouragement for the correct arguments and leads faulty assumptions back on track, the facilitator is just as curious about the implications of any statement. Whilst the teacher makes sure that everyone gets a fair chance to speak and that all the pupils are given more or less the same amount of time to express themselves, the facilitator may get caught up in one particular statement and spend an hour on a conversation that involves just a few pupils.

Ketil Rogn has, on the basis of analysis of current educational material, books, and articles, come up with the following characteristics describing the principles for dialogic practice within the subject of religion:

- As many as possible should be active participants
- To take part in discussion means to express ones opinions and convictions
- The question of what is ultimately good or true is a personal matter and therefore should not be discussed in school

(Rogn 2006: 4)

In practice such principles can temporarily hinder the development of critical reasoning. If, for example, all pupils should put forward their opinions, then the discussion would soon become a rattling off of opinions. This would mean that the pupils learn to give their subjective opinion rather than reasoning in co-operation with others. To speak becomes a right and a privilege quite apart from the quality and relevance of that which is said. If the question of what is good and true is a private affair, then it becomes difficult to make the pupils assertions the starting point of critical analysis. And, with regard to the last point, the philosophical dialogue is designed to move out of the private arena and into the public one.

The ideals for philosophical dialogue are here directly in opposition to the ideals for dialogues as they are described in the educational literature analyzed by Rogn. Philosophical dialogues are, as Brenifier points out, not just an exercise in formulating ones opinions but an exercise in distancing oneself from these standpoints and perspectives in order that one may take part in those of the other. It is not an exercise in speaking but in thinking (Rogn 2006, Brenifier 2004b).

Rogn further argues that dialogues based on the three ideals described here have a tendency to diminish potential philosophical insight into personal conviction and belief, something which makes it difficult to establish a community of inquiry. Synnøve Matre's doctoral thesis re-enforces such a perspective. She demonstrates how pre-school children spontaneously give free-rein to their fantasy, philosophizing and reasoning together towards new insight. However, when an adult takes part in the conversation, the children express themselves singly in a monologue by recounting stories. Whereas eight years old schoolchildren primarily express themselves via storytelling, even when they do not perceive an adult as present in the conversation. Their ability for group investigation and development of ideas and arguments appear, according to Matre, to be weakened (Rogn 2006, Matre 2000).

This means that an adult may have the tendency to encourage children to tell stories, and not involve in reasoning. An illustration of this is how schoolchildren are told to raise their arm and await their turn to speak. But, if pupils have to sit around waiting their turn to tell what they are bursting to say, it is not very likely they are going to listen to what is being said, and will demonstrate this by the way in which they contribute. And thus, the whole discussion ends up as a series of disparate viewpoints. In the philosophical dialogue it is the co-operate reasoned endeavour that is the ideal. This means that each contribution must relate directly to the work in progress (Brenifier 2004b).

Another contrast lies in the teachers' role as the sole bearer of knowledge. If the pupils believe the facilitator to be the one with all the answers, they will look to her for the answers by attempting to interpret her facial expressions, voice and body language, rather than relying of their own thinking.

All in all, there is a huge contrast between fixed teaching methods and philosophical dialogues in the classroom. If the teacher is constantly aware that the class should have covered a certain amount of material or a certain amount of knowledge in a required space of time, then she will limit the flow of the discussion. This may require limiting the number of subjects in the timetable to make way for philosophical dialogues. Hellesnes can be taken as a supporter of such a view. He writes;

“Wisdom and understanding does not primarily rise from a comprehensive education, but an education promoting “cultivation”. Cultivation has to do with reasoning on what constitutes the magnitude of scientific matters e.g. reasoning over the conscious subjectivity and the everyday life which is the starting point of everything”

Another objection to having philosophical dialogues in science classes can be that if one is bound up in continuous discussion about the different approaches and interpretations of the subject being taught, then the teaching can be seen as disorganized and ambiguous. Meanwhile Lipman does not consider this as a particularly relevant problem. He believes that if we accept the reflexive academic paradigm, that knowledge is not something which exists objectively in the world independently of those who believe they are in possession of it, but is something constantly being constructed and modified within a community, then the traditional pedagogical paradigm becomes problematic. Therefore it becomes pivotal to give pupils the opportunity to understand and reflect upon what is being taught, and the relationship between dissimilar bits of knowledge (Lipman 1980). He further points out that the philosophical dialogue helps pupils to uncover meaning in the separate parts and in their connection to the whole by creating a comprehensive overview. In that it is only in relation to the whole that everything has meaning, it would be meaningless, as he sees it, to learn fragments without always seeing them in light of the comprehensive (Lipman 1980). It is nevertheless essential too point out that it is the teacher who is responsible for helping the pupils to create such a framework. This is something that must be systematically focused on in the facilitation of the dialogue.

## **Conclusion**

We have drawn up an approach to how a particular methodology of facilitating philosophical dialogues in science classes may improve the pupils learning experience, and create a community of inquiry. The introduction of philosophy in science classes is of a large experimental nature in that, up until now, there has been little experience in this field. It is not to be assumed that it immediately will improve the pupils' performance, even though much points to this. We have campaigned for such an approach, and there is research that points in this direction (e.g. Daniel 1999, Lipman 1980: 219-224). PISA- research projects show a direct relation between the schools ability to motivate pupils to learn via co-operative work, and the pupils' educational performance (Turmoe 2004: 46). However, there has been pointed out that there is a need for more research in this field (Breivik&Løkke 2007: 34-38).

However there can be other, more profound social and individual reasons for introducing philosophical dialogues in the classrooms linked with democratic and humanistic ideals of the old Greek sense. We have drawn up an approach to integrating philosophical dialogues into science classes where it is exactly the focused concentration on drawing out the difference in pupils understanding and perspective that supplies the foundation for the group's development of precise and refined comprehension of the theoretical and scientific approach. One can see, through our methodological analysis, a direct connection between the acquisition of knowledge and the development of identity and the ability to take action. And thus a foundation is laid to participate in a workplace, and to realize oneself as a person, as a fellow human being, and as a citizen in a democratic society.

The method implies that the teacher should not solely take on the role as instructor. His primary role is to awaken interest in the pupils towards scientific and philosophical issues and introduce them to academic thinking, and to help them to look for answers themselves through independent reflection.

This is not a passive teaching role that allows the pupil to take control of the learning situation. The facilitator must consciously and actively take responsibility for the pupils learning process, something which demands curiosity, creativity, conscious presence, and not least a high degree of theoretical insight and practical competence.

## References:

Arendt, Hannah (1963): *Eichmann and the Holocaust*, London: Penguin Books

Arendt, Hannah (1968a): *Totalitarianism*, New York: Harcourt, Brace & World, INC.

Arendt, Hannah (1968b): *Antisemitism*, Florida: Harcourt, Brace & Company

Arendt, Hannah and Beiner, Ronald (1992): *Lectures on Kant's political philosophy*, Chicago: University of Chicago Press

Arendt, Hannah (2002): *Vita activa oder Vom tatigen Leben*, Munchen: Piper

Breivik, Jens & Løkke, Håvard (2007): *Filosofi i skolen – en kunnskapsoversikt*, The Norwegian Departement of Education, published at;  
<http://www.regjeringen.no/upload/KD/Vedlegg/Rapporter/Filosofi%20i%20skole.pdf>

Brenifier, Oscar (2004a): *Bare spør!*, Oslo: Cappelen forlag

Brenifier, Oscar (2004b): *A quick glance at the Lipman method*, Paris: Diotime—l'Agora, no 21, også publisert på; <http://www.buf.no/en/read/txt/?page=ob-lip>

Bruner, Jerume S. (1977): *The Process of Education*, Cambridge: Harward University Press

Bruner, Jerume S. (1962): *On knowing – Essays for the left hand*, Cambridge: Harward University Press

Dale, Erling Lars (1993): *Den profesjonelle skole: med pedagogikken som grunnlag*, Oslo: Gyldendal; Ad Notam

Daniel, M.F m.fl.(1999): *Philosophical Dialogue among Pupils: A Potent Tool for Learning Mathematics"* I: Palsson, H., B.m.fl: *Philosophy for Children on Top of the World*, Akureyri: University

Dewey, John (1998): *Experience and education*, Indiana: Kappa Delta Pi

Dewey, John (1997): *Democracy and education*, New York: The Free Press

Hellesnes, Jon (1992): *Ein utdana mann og eit dana menneske I*: Dale, Erling Lars (red): *Pedagogisk filosofi*, Oslo: Ad Notam Gyldendal

Imsen, Gunn (2003): *Elevens verden*, Oslo: Universitetsforlaget

Kjernsli, Marit m.fl. (2007): *Tid for tunge løft- Norske elevers kompetanse i naturfag, lesing og matematikk i PISA 2006*, Oslo: Universitetsforlaget

Kunnskapsdepartementet (2006): *Kunnskapsløftet – fag- og læreplaner*, The Norwegian Department of Education, published at [http://www.udir.no/upload/larerplaner/generell\\_del/generell\\_del\\_lareplanen\\_bm.pdf](http://www.udir.no/upload/larerplaner/generell_del/generell_del_lareplanen_bm.pdf)

Lipman, Matthew (1988): *Philosophy goes to school*, Philadelphia: Temple University Press

Lipman, Matthew et al (1980): *Philosophy in the classroom*, Philadelphia: Temple University Press

Matre, Synnøve (2000): *Samtaler mellom barn : om utforskning, formidling og leik i dialogar*, Oslo : Samlaget

Plato (1985): *Meno*, Warminster: Aris & Phillips

Rogn, Ketil (2006): *En sammenlikning av dialogbegrepet i KRL og filosofi med barn*, Høgskolen i Hedmark: PPU, publisert på: <http://www.buf.no/les/avh/?page=kr04>

Schjelderup, Anne (2006): *Filosofi i skolen som demokratisk dannelse*, Universitetet i Oslo: Pedagogisk forskningsinstitutt, publisert på: <http://buf.no/les/avh/?page=as-hfo01-1>

Are Turmoe, Svein Lie (2004): *Hva kjennetegner norske skoler som skårer høyt i PISA 2000?*, Acta Didactica 1/2004

Vygotsky, Lev (1978): *Mind in Society - The development of Higher Psychological Processes*, London: Harvard University Press