Constructive Controversy as a Way to Create “True Collaboration” in an Open Ended Group Project Setting

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Abstract

The IT in Society course is based on an Open Ended Group project framework that has been developed in an action research manner. It is a course where students participate in a real project, where they have the possibility to take part of an unusual learning experience where they address a complex and multifaceted real problem. A learning theory has evolved in parallel to the process of developing the course, and this paper will illustrate how the instructional procedure constructive controversy has influenced a recent development of the course and the underlying learning theory. The focus has been on the issue of creating “true collaboration” through introducing the action speed dating.

Keywords: Open Ended Group Problems, action research, constructive controversy

1 Introduction

The IT in Society course [Laxer, Daniels, Cajander & Wollowski, 2009] is based on an Open Ended Group project framework that has been developed in an action research [McKay & Marshall, 2001] manner. A learning theory has evolved in this process and this paper will illustrate how constructive controversy [Johnson & Johnson, 2009] has influenced a recent development of the course and the underlying learning theory. The focus has been on the issue of creating “true collaboration” [King, 2007] through introducing the action ‘speed dating’.

There are two reasons for striving to create a setting where true collaboration is achieved. The foremost being that it is an essential part of the constructivist model of learning assumed, but it is also seen as important for the outcome of the project in the course. Hence true collaboration in this setting would improve the learning experience as well as the product of the project. The latter is of importance for the collaboration, present and future, with the client and for the self esteem of the students.

Constructive controversy is based on the idea that discussions and controversies might create a good starting point when trying to understand a complex problem. Students will improve their skills to constructively and innovatively think and find solutions to complex and wicked problems. In this paper we will describe how we used the ideas of constructive controversy to enhance the learning experience in a project course through the use of speed dating as a method.

The outline of the paper is to first present the action research framework, the educational setting, and the main underlying learning theories relevant for the action studied in order to provide a background. This is complemented with a short description of views of collaboration and a capturing of previous attempts to address the issue of true collaboration. Speed dating was introduced 2008 in order to promote collaboration. A more structured, scripted, version of speed dating is the action suggested to enhance the learning environment with regard to true collaboration. The new version of speed dating is described and motivated from a constructive controversy point of view.

2 Method

Action Research is the methodology used in the work reported here and it has been the work model for several years in developing the IT in Society course [Laxer, Daniels, Cajander & Wollinski, 2009] and a learning theory corresponding to this course. The action research cycle as described in [Susman & Evered, 1978] is used to provide a setting for our discussions, where we consider the passing of one academic year as the time it takes to complete one cycle. We will start with Specifying learning by presenting some general findings related to one learning objective of the course preparing for the Diagnosing stage where the problem we wish to address is identified. The more concrete stages Action planning and Action taking follows and is the core of this paper. The Evaluation stage will be approached in two ways, first by recapturing the results from a first prototype of the action taken during 2008 and then by outlining the manner of capturing relevant data from the action implementation in the 2009 course.

We will further use the elements in the action research framework defined in [McKay & Marshall, 2001] to give a structure to the key dimensions of the work presented. The five elements are:
[F] the research framework or conceptual element informing the research;

[M_R] the research method to be adopted;

[M_P] the problem solving method that will be used in the practice situation;

[A] the problem situation of interest to the researcher (the research questions);

[P] the problem situation in which we are intervening (the practice questions of interest to the practitioners).

Where F comprises Constructivism [Piaget, 1970], an Open Ended Group Projects (OEGP) framework [Faulkner, Daniels & Newman, 2006], Cognitive load [Miller, 1956], Collaborative learning [Dillenbourg, Baker, Blay & O’Malley, 1996]. The research method M_R used is what could be called Practical action research. Scripting [King, 2007] what the students last year invented under the name ‘speed dating’ will be used to build a scenario for creating a Constructive conflict [Johnson & Johnson, 2009] situation as the problem solving method M_P. The problem situation A of interest is how to facilitate a learning situation where true collaboration within the student cohort is achieved. The problem situation P is finding relevant overlap between the work done in subgroups in the student project team.

In prior years we have used the dual action research cycle to generate knowledge about: global collaboration, the introduction of an external mentor and gender in education. Some of these iterations have resulted in international research publications, most notably [Daniels, Cajander, Clear & Pears, 2010] and all the iterations have improved the learning experience of the students.

3 Educational Setting

The IT in Society course is run in collaboration with a course in USA (Communication in a Global Society) and is offered to students taking the first semester of the fourth year. The course accounts for half of the study load for a student during that semester in the IT engineering degree program at Uppsala University, Sweden. A goal of the IT in Society course is that the students should be able to constructively participate in a project dealing with a complex and multifaceted problem set in a real environment.

The educational setting is described in [Laxer, Daniels, Cajander & Wollinski, 2009]. Some issues in the 2008 instance: introduction of an external mentor [Cajander, Clear, and Daniels, 2009]; and an analysis of the process [Cajander, Clear, Daniels, Edlund, Hamrin, Laxer & Persson, 2009] done mostly by the students themselves, also provide useful information about the course. A short summary might however be useful in reading this paper.

Since 2002 the setting has been the Uppsala Academic hospital and since 2004 all students have been involved in the same project. The number of students has varied from 20 to 45, depending on the year. The results in the course have several times been presented at the European Council level.

4 Theoretical Background

Theories of learning are central to the action research approach taken by the authors and this section will briefly introduce Constructive controversy and Open Ended Group Projects (OEGP). Constructive controversy is relevant to the M_P element in the framework by McKay and Marshall and OEGP is an important framework for the research. The evolved learning theory for running the IT in Society course is also part of the research framework, equally in the F element.

4.1 Constructive Controversy

Controversy is a (negatively) loaded word and is something that most teachers would by instinct try to avoid in their courses. Constructive on the other hand conveys a clear positive signal to these teachers. The combination of the two still leads to warning signals and thoughts related to conflict. The potential of constructive controversy as an instructional procedure is however quite promising. Johnson and Johnson define it as follows:

Constructive controversy exists when one person’s ideas, information, conclusions, theories, and opinions are incompatible with those of another and the two seek to reach an agreement [Johnson & Johnson, 2007]

The key aspect for the concerned teacher is the seeking of agreement. The important aspect in a learning situation is the focus on different aspects of an issue. The literature about constructive controversy [Smith, Johnson & Johnson, 1981; Johnson & Johnson, 2009] typically contrasts the method with ‘Concurrence seeking’ regarding the conflict or controversy side and with ‘Debate’ relating to the issue of bringing up alternative views.

The drawback with concurrence seeking is the danger of not considering alternative solutions and becoming too focused on the positive aspects of the solution selected. An analogy is to see all “problems” as nails when one has a hammer as a tool.

The debate on the other hand does address the issue of not giving enough space to alternative solutions, but the problem is that there is no incentive to look into the virtues of alternative solutions. The whole point is to prove ones own solution as superior at the expense of the others.

The benefit of constructive controversy is that alternative solutions will be presented and adequately considered and efforts will be made to find ways to reconcile the differences in finding a satisfying solution considering the different aspects that has been brought forward in the process. The idea is that the participants needs to have a thorough understanding of the different aspects, including questioning their own solution, in order to be constructive in their seeking of agreement. There is an emphasis on
creating new solutions as opposed to sticking to original ones as in e.g. a debate.

Demonstrated effects of constructive controversy are an epistemic curiosity for new information and perspectives even after the course, high achievement in task at hand, building of positive relationships among the students [Johnson & Johnson, 2009] which are highly valuable outcomes and indicate that the approach should be considered for adoption. The cautionary view of many teachers when being asked about using constructive controversy in their courses does have relevance, in that non-resolved conflicts, with all the accompanying negative consequences, can occur. The implementation of the method is thus of high importance and the prototype version of speed dating used in the 2008 course instance indicates that with proper scripting a successful implementation is likely.

To summarize, the aspects of constructive controversy concerning learning are in accordance with the learning theory developed around the OEGP based IT in Society course. Furthermore, scripting the speed dating concept based on the constructive controversy concept seems like a promising approach towards improving collaboration in the course.

4.2 Open Ended Group Projects

The Open Ended Group Project (OEGP) framework referred to in this paper is described in [Faulkner, Daniels & Newman, 2006; Hauer & Daniels, 2008]. It is based on a similar view of learning as underpins Problem Based Learning [Kolb, 1984; Kolmos & Algreen-Ussing, 2001], Situated Cognition [Brown, Collins, & Daguid, 1989], Practice fields [Barab & Duffy, 2000], and Communities of Practice [Wenger, 1998]. It is furthermore closely related to ideas concerning use of ill-structured problem solving [Jonassen, 1997].

The view of knowledge, the epistemology, is constructivism [Piaget, 1970] in which knowledge is constructed in interaction with the environment. Thus construction of knowledge, here seen as learning, is seen as a social process. The immersion of the learner in a complex realistic real world problem is seen as instrumental for creating the context for learning. The need for discussion is paramount in addressing open ended problem and the social process vital for learning is seen as a social proc ess. The immersion of the learner in a complex realistic real world problem is seen as a social process. The immersion of the learner in a complex realistic real world problem is seen as a social process. The immersion of the learner in a complex realistic real world problem is seen as a social process. The immersion of the learner in a complex realistic real world problem is seen as a social process.

The actual implementation of an OEGP can unsurprisingly vary considerably depending on a number of factors, e.g.:

- Where it occurs in the academic programme (i.e. which year/semester).
- Number of students involved.
- Time available for the OEGP.
- Academic credit offered for the work.
- Method by which groups are formed and managed.
- Type of task chosen as the problem.
- Inter-relationship between the groups.
- Educational ‘objectives’ or ‘intended learning outcomes’.

We wish to conclude this paragraph with a quote from [Faulkner, Daniels & Newman, 2006]

“An OEGP can often be a way of creating a much more exciting and fulfilling environment for the teacher too since with an OEGP both students and teacher are carrying out a piece of work the result of which may be wholly or partially unknown. As the backgrounds of the students are likely to be very different, their attitudes and solutions to problems will be different too and this makes for a much richer and more exciting learning experience since they will come across a mix of solutions that they would not find on their own. The OEGP approach has the added advantage that plagiarism, typically a serious concern for coursework exercises, has not been a problem for any of the authors.”

4.3 The Theory of Learning in the IT in Society Course

Action research is used to develop and evaluate actions introduced in the IT in Society course. It is also used when developing a theory of learning underlying the course, or rather a sequence of theories starting from a rather pure OEGP version to versions where other related learning theories are blended in to create a more “scaffolded” version of OEGP. The development towards a more scaffolded version is due to observations that some students have not been able to accommodate to a “genuine” OEGP approach. Time constraints and unfamiliarity with the education setting can lead to too high a cognitive load and might be explanations for the unsatisfactory situation.

Developing a balance between scaffolding and a “genuine” OEGP is a delicate task [Hauer & Daniels, 2008] and the approach in this case will be in the form of scripting. Scripting, i.e. giving a script for the students to follow, will be used as a scaffold by providing a scenario in which the students will be guaranteed to experience all the aspects of the Constructive controversy situation.

5 The True Collaboration Issue

Here, the problem situation A is described and discussed. We have experienced that students in the project focus too much on their own perspective of the project and that there is a lack of true collaboration.

5.1 Collaboration vs. Cooperation

This is related to the discussion comparing collaboration and cooperation as presented in [Dillenbourg, Baker, Blay
Generally the term collaborative learning means that learners are engaged in activities that are intended to introduce socio-cognitive processes. This meaning implies an important distinction between collaborative and cooperative learning. Cooperative learning often involves separate activities by individuals through the distribution of labor or task components, with little of the joint activity that induces socio-cognitive processes so characteristic of true collaborative learning. (p. 18)

This description of collaborative learning fits well with the intention of collaboration in the IT in Society course.

### 5.2 Previous Iterations

The issue of true collaboration is, as we see it, closely related to the motivation aspect in the course. Situating the project in the hospital and addressing a real problem has been introduced in order to increase motivation to work hard in the project and to aim for high quality. This has largely been a successful approach.

The setting deemed most important in order to achieve true collaboration has been the OEGP approach. The framework, if successful, is based on the students owning the problem as well as the solution. The students are however not used to the OEGP approach and some never seem to 'get over the hump' and end up in some sort of limbo not knowing what to do. The approach up till now has mainly been based on informing the students about the learning theory and pointing out collaboration as an important vehicle towards outstanding and interesting solutions.

Another attempt to increase motivation in line with OEGP ideas has been the adding of an international component in the form of students from the US. This is captured by King & O’Malley, 1996; King, 2007] and by others in the cognitive psychology domain. This is captured by King as follows:

**Students been seen as too complex and they have thus levels of collaboration.**

This component has for many the Atlantic is however nontrivial and often lead s to low close collaboration with participants on two sides of the setting deemed most important in order to achieve true collaboration has been the OEGP approach. This has however been deemed deficient in creating a learning environment in which the students are truly collaborating. The step to remedy this shortcoming and the next evolution of the learning theory behind the IT in Society course will include using constructive controversy in order to push the students towards true collaboration.

### 6 “Speed Dating” as Conveyor of “True Collaboration”

#### 6.1 Speed Dating

The speed dating concept was introduced in the 2008 version of the course as a student initiative. The students were faced with having to do a major restructuring of the white paper they were working on and needed a way to get the whole cohort up to speed with the new direction as well as identifying concrete examples on what to enter into the new structure. An afternoon was set aside in which each of the seven subgroups met with all the other subgroups and tried to identify common issues during a quick meeting [Cajander, Clear, Daniels, Edlund, Hamrin, Laxer & Persson, 2009].

This turned out to be an effective way to get a large portion of the students aware of the project as a whole and how their own work fitted, as well as providing useful insights into who could address an issue that subsequently surfaced in the work to create the white paper. The authors, who were teachers in the course, were of the opinion that the collaboration was of a depth and genuineness that had a much stronger sense of true collaboration than in earlier instances of the course. This is of course not solely due to the speed dating exercise, but the contribution was deemed to be highly important.

#### 6.2 Relation to Constructive Controversy

The idea of speed dating worked well in 2008, but the felt potential of the idea was not reached. The constructive controversy model will be used to provide an informed decision in line with the ambitions in our action research approach to developing the course. The aspects to pay attention to are how to ensure that the students will be involved with the stages related to constructive controversy [Johnson & Johnson, 2009]:

1. Students are assigned problem/decision, initial conclusion
2. Students present and listen, are confronted with opposing position
3. Students experience uncertainty, cognitive conflict, disequilibrium
4. Cooperative controversy
5. Epistemic curiosity, information search
6. Incorporation of new information, adaption to diverse perspectives, new conclusion

These stages and the underlying learning model will be integrated in the new version of the learning theory for the course and as such serve as the guiding light for the development of the script for the speed dating activity.

#### 6.3 Plans for the 2009 Course Instance

There will be two speed dating instances, one mid way with the prime focus on creating trust among the students...
and concrete insights into the value of true collaboration. This will be based on having formed a firmer opinion and knowledge about their specific subgroups. The second one will be held near the end of the course when the students need to truly integrate what they know in creating a document for the client. The focus for the first instance is on issues clearly identified as being valuable for the progress of the project as a whole. One aspect is to prepare for a potential restructuring of the groups, where subgroups may be closed and new subgroups formed as well as students moving into new constellations.

There will be scripts for pre and post meetings as well as a script for the speed dating event to be followed including a definition of specific roles for the students to follow at the speed dating event. The pre and post meetings are important parts of the constructive controversy component. The scripts will serve both as a guide for the students on how to act in line with the learning theory for this action and as a way for us to get information about the result of the action.

The plan for the first speed dating instance is related to the six stages of constructive controversy in the following manner.

Stage 1
This is based on the students having become “experts” in the area of their subgroup (each subgroup is responsible for one area within the overall project) during the project up till the pre meeting point in time. The assignment at the pre meeting is to identify, for each of the other subgroups, something the subgroup wants them to do in order to strengthen their work.

Stage 2
This is done during the speed dating event where each subgroup will have a short meeting with all the other subgroups. Both groups in a meeting will follow a script in which the members act according to specific roles and where both groups present something that they want the other group to do to help them. The proposition will come from the perspective of the presenting subgroup and may be in conflict with how the other subgroup wants to spend its time.

Stage 3
The propositions will be based on a perception from the other subgroup about what the area is for a subgroup and what the value of that area is for the overall project. This is in most cases likely to be an enlightening experience for the students and one where doubt and conflicting thoughts will arise.

Stage 4
The outcome of the speed dating meeting is an agreement on how to proceed with each proposition. This should be based on the criteria of spending time on the action being of value to the project overall. This is deemed to require a fair amount of creative thinking and in line with realizing values essential in true collaboration settings.

Stage 5
The speed dating event is intended to give the students a genuine understanding of the project as a whole and create a curiosity about how they best can contribute to the progress. This stage will start during the speed dating event and is assumed to continue during the rest of the project (as well as after the course).

Stage 6
This stage is associated with the post meeting in which plans for the reminder of the project will be defined.

7 Conclusions
The constructive controversy model has been used to inform the development of a new action for the IT in Society course and the learning theory for the course has been modified accordingly as part of an action research approach. One essential benefit of this approach is to have a structure to refer to when it comes to specifying how to change the course. It has also been important to have the benefits and pitfalls presented in the development process.

The changes do not sit in a vacuum and it is also imperative that the overall learning theory for the course is not violated. Of special interest here is not over specifying what the students should do in order to keep the learning benefits associated with the OEGP framework. Important in the process of keeping a balance has been to look into work concerning different methods for working together. The “true collaboration” concept as defined in [King, 2007] has been useful in this case.

The approach is also deemed to be beneficial for the international collaboration aspect of the course. Firstly as a byproduct of a deeper collaboration, but also as an opportunity to lift cultural difference to the light. An example of the latter is to discuss the effects of the gap between the consensus searching Swedish culture with the more (early) decision oriented American approach.

References


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