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Cooperative Learning: Group Processing and Students Needs for Self-Worth and Belonging

The purpose of this study was to examine students' perceptions of the extent to which reflection, a principle of cooperative learning, satisfied their needs for self-worth and belonging. Eight mature preuniversity students completed a scaled questionnaire and took part in a focus group interview following a 12-week preliminary study into the efficacy of reflection. Students perceived reflection as contributing to the satisfaction of their needs for self-worth and belonging. They also perceived reflection as contributing to their needs for acceptance. This was unexpected and is perhaps critical, as acceptance might be a condition of effective learning. Hence this article calls for further research into reflection in relation to acceptance and the role these play in contributing to effective learning and teaching.

L'objectif de cette recherche était d'étudier les perceptions des élèves quant à la mesure dans laquelle la réflexion, un principe de l'apprentissage coopératif, répondait à leurs besoins d'appartenance et d'estime de soi. Suite à une étude préliminaire de 12 semaines sur l'efficacité de la réflexion, huit élèves raisonnés préuniversitaires ont complété un questionnaire gradué et ont participé à une entrevue en tant que groupe de discussion. Les résultats indiquent que les élèves perçoivent que la réflexion répond à leurs besoins d'appartenance et d'estime de soi. De plus, ils croient que la réflexion contribue à répondre à leur besoin d'être acceptés. Ce résultat était inattendu et pourrait s'avérer crucial, l'acceptation pouvant être une condition essentielle à l'apprentissage efficace. L'auteur lance donc l'appel pour que la recherche se poursuive sur le rapport entre la réflexion et l'acceptation d'une part, et le rôle que jouent ces deux éléments dans l'apprentissage et l'enseignement efficaces d'autre part.

Introduction

Embracing the focus of social cohesion, educational policy-makers believe that an effective education system must aim at developing the knowledge and abilities to cooperate and reflect. Led by the grandfathers of cooperative learning, the Johnson brothers, researchers and practitioners have uncovered that the ability to cooperate depends, among other factors, on interaction and organizational skills (Cohen, 1986; Johnson & Johnson, 1994; Kagan, 1994; Sharan & Sharan, 1992). They also proposed that the development of interaction and organization skills can be accelerated when people reflect on their actions and achievements (Bellanca, 1992; Cohen; Hubert & Eppler, 1990; Kagan). Cooperation and reflection appear to be essential characteristics of people living in a knowledge-based global economy and to give direction to the purpose of contemporary education (Education Queensland, 1999).

This study involved eight mature-age students in a preuniversity program. It examined students' perceptions of the effect that a cooperative learning environment implemented over a 13-week period had on their perceptions of

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their senses of self-worth and belonging. The study centered on one of the five key principles of cooperative learning; often named *group processing*, this principle is a specific type of reflection. Based on the teacher-researcher's belief that students' basic psychological needs must be satisfied before they can study successfully, this study has the potential to uncover effective means of learning and teaching.

Background

This study, which involved eight mature-age students in a language and learning class of a Studies for Tertiary Education Preparatory Skills (STEPS) course at a regional Australian university, was conducted by their teacher who aims, among other things, at providing a learning environment and experiences that have the potential to satisfy students' basic psychological needs. Given her previous experiences and having undertaken a literature review of cooperative learning and needs theories, the teacher-researcher envisaged that students' needs could be met in a cooperative learning environment. More specifically, it was assumed that one principle on which cooperative learning is based, group processing, could be instrumental in meeting the students' needs for self-worth and belonging.

Cooperative Learning

Cooperative learning here refers to a teaching methodology based on small groups working toward a common goal. Educational research into cooperative learning over the last three decades, especially the fierce debate between the Johnson brothers and Slavin, not only enticed some agreements (Cohen, 1994), but also helped confirm the solidity of work such as that of Deutsch half a century earlier. That is, researchers identified two factors that affect the outcomes of cooperative methods (Johnson & Johnson, 1994; Johnson, Johnson, & Smith, 1998; Kagan & Kagan, 1994; Slavin, 1995): structures and principles. Structures include how tasks are organized to achieve specific goals as well as the composition and management of groups or learning teams. Further, the effectiveness of structures depends on five principles: positive interdependence, individual accountability, face-to-face interaction, social skills, and group processing. Although Deutsch did not coin the current cooperative learning terminology, his early observations and writings referred to the essential concepts of interdependence and accountability.

In a cooperative learning setting, the group's success depends on the individual contribution of each member because the learning of one member affects the others. This sine qua non condition of cooperative learning is called positive interdependence (Johnson & Johnson, 1994). Positive interdependence can be enhanced by the second principle, individual accountability. In other words, individuals are each responsible and feel answerable for their own learning and their own contributions to the group (Kagan & Kagan, 1994). According to M. Kagan (personal communication, November 4, 2005), most people struggle to satisfy two opposite needs: belonging and independence. Cooperative learning provides an avenue whereby people can satisfy both needs. The principle of positive interdependence promotes a sense of belonging, and the principle of accountability promotes the need for independence. Both belonging and independence are strong needs, neither of which is mutually exclusive.

To this end students require involvement in activities that promote participation (Johnson & Johnson, 1994). Class norms such as asking for and offering help and being courteous and supportive can be encouraged, for example, by assigning roles to group members. These could include the roles of task manager, researcher, reporter, encourager, or timekeeper as was the case in the early stage of this investigation. Task rotation will ensure that all students are given the opportunity to learn the various skills associated with each task. Another way to promote accountability is to have students each take a leadership role in researching a particular part of the work to be studied and teaching the other students what they have discovered. This approach constitutes the basis of group investigation (GI), a structure that was used in the last weeks of this investigation.

Cooperative learning promotes face-to-face interaction in the classroom. Kagan (1994) and others (Hamm & Adams, 1992; Johnson & Johnson, 1994; Wells, Chang, & Maher, 1990) proposed that the principle of simultaneous interaction is the stepping stone to students' increased motivation and cognitive gain. Student interaction also provides intellectual stimulation and plays a vital role in the construction of knowledge (Hendry, 1996; Slavin, 1995). The sharing of knowledge and interpretations differentiates cooperative learning, in which students and teacher learn together, from traditional methodologies in which the reliance is mainly on the students learning from the teacher.

Cooperative learning involves a group of people acting together for the common purpose of learning; thus the ability to deal with people is a prerequisite. As this ability is not innate, interpersonal skills need to be developed (Cohen, 1986; Johnson & Johnson, 1994; Kagan, 1994; Sharan & Sharan, 1992). Kagan firmly believes that the acquisition of social skills is best achieved through a structured approach where skills are modeled, practiced, reinforced, and reviewed. Mastery of social skills results from planned practice supported by evaluation and reflection about the interaction of the group members. In the context of cooperative learning, these mechanisms are referred to as group processing.

Reflection and Group Processing

Group processing may be defined as "reflecting on a group session to a) describe which members' actions were helpful and unhelpful and b) make decisions about what actions to continue or change" (Sharan, 1990, p. 32). In the words of Johnson et al. (1998), it is "the identification of ways to improve the process members have been using to maximize their own and each other's learning" (p. 29). On the one hand, students need to know what they are doing well so that successful strategies can be repeated (Slavin, 1988). On the other hand, they need to understand how they can improve their behavior (Woolfolk, 1993).

The literature also identifies group processing as a valuable learning tool (Boud, Keogh, & Walker, 1985) because it helps learners to focus on reality. This focus on reality has been emphasized by Bandura (1986), Gibbs (1981), and Glasser (1965, 1986) as well as Mezirow (1991), who qualified the statement and specified that "scores of studies ... have found that it is not so much what happens to people but how they interpret and explain what happens to them that determines their actions, their hopes, their contentment and emotional

well-being, and their performance." For this reason, the students' perceptions were to become a vital ingredient of this investigation.

Early in the 20th century, Dewey (1933, cited in Schön, 1991) highlighted reflection as the main factor between knowledge telling and knowledge transforming. This critical dimension of Dewey's beliefs supports the idea that reflection is an integral part of learning and emphasizes reflection as a purposeful activity and a means of both knowledge construction and empowerment. Schön's (1983, 1987) model of reflection presents knowing and thinking as bound in action, whereas van Manen's (1991) includes the notion of tactful action. Both Schön's and van Manen's contributions are relevant in a setting based on interaction between people such as cooperative learning. In sum, reflection and group processing are powerful learning tools.

Needs for Belonging and Self-Worth

Another key theoretical underpinning of this study was needs theory, which states that basic psychological needs such as those for belonging and self-worth must be met before effective learning can take place (Glasser, 1965, 1969; Maslow, 1970a). Maslow (1970b) defines the need to belong as the "hunger for affectionate relations with people in general, namely, for a place in his group or family" (p. 43). In this context, it refers to the need to be part of the learning community in general and the cooperative learning group in particular.

Although Maslow (1970b) defines the need for self-worth as the need for "respect and recognition from others" (p. 43), it can also refer to the need for a feeling of respect and confidence in one's being that can be attained through achievement or mastery. Ultimately, it is the need for an unconditional positive opinion of self and for a sense of purpose.

It was proposed in this research that the questions of how and why group processing benefits students relates to both needs theory and cooperative learning. On the one hand, needs theory exposes the conditions necessary for learning to take place; on the other hand, cooperative learning is based on principles that set the conditions necessary for learning.

Focus

To my best knowledge, apart from Glasser's (1969, 1986, 1990) covert suggestion that they could be brought together, needs theory and cooperative learning have so far been addressed separately. A close analysis of the literature revealed an implicit link between needs theory and cooperative learning in general and group processing in particular. Hence the overall aim of the research was to make explicit the connection between needs theory and group processing and to explore the extent to which they are related. There were two research questions:

- Do students perceive that group processing, a principle of cooperative learning, affects their senses of self-worth in a cooperative learning environment?
- Do students perceive that group processing, a principle of cooperative learning, affects their senses of belonging in a cooperative learning environment?

This research on group processing differs from earlier research projects on group processing that compared either cooperative groups with group

processing and cooperative groups without group processing (Yager, Johnson, Johnson, & Snider, 1986) or teacher-directed group processing with student-directed group processing in cooperative learning settings and with students working individually (Johnson, Johnson, Stanne, & Garibaldi, 1989). This study incorporated teacher- and student-directed group processing and was not about whether group processing benefits students; it was about whether students perceive group processing as contributing to the satisfaction of their needs for self-worth and belonging.

Methods

This study is the second phase of a two-part investigation that took place over a 13-week period with one three-hour weekly lesson, during which time Think-Pair-Share activities (TPS), based on Kagan (1994), and Group Investigation (GI), grounded in Sharan and Sharan (1992), were the learning structures of a language and learning course. The length of the cooperative learning sessions varied between 20 and 60 minutes to culminate with a two-and-a-half-hour session for the Group Investigation in Weeks 11 and 12. The content of the lessons ranged from writing paragraphs to organizing text and reading techniques. Group members also practiced well-defined group roles such as those of task manager, encourager, scribe, and timekeeper. In their efforts to develop a supportive and cooperative learning environment and to complete the set tasks, students set, implemented, evaluated, and reviewed goals. Students answered structured questions and reflected on how supportive they were of each other and later on their progress in developing supportive behaviors and achieving learning goals. In Weeks 11 and 12, students planned, prepared, and delivered a presentation in groups of three to four. Although the course focused on reading techniques, the research component strictly examined the students' perceptions of the strengths and weaknesses of the group, the group goals and outcomes, and the contributing factors to the group success or otherwise. Appendixes A and B provide an overview of the research design and of the data-gathering instruments respectively. In the preliminary study, the first stage of the investigation, the focus was on the implementation of reflection; the data were gathered via guided reflection questions in the form of journal entries and through open questions (see Appendix C). In the main study, the focus was on the students' perceptions of the effects of reflection on their psychological needs for self-worth and belonging; the data were gathered through a scaled questionnaire (see Appendix D1) and a focus group interview.

The items on the scaled questionnaire and the focus group interview were developed specifically for this study and supplied two complementary sources of information. The scaled questionnaire produced numerical information that provided general trends about the students' perceptions of the effect of reflection on their feelings of self-worth and belonging. On the other hand, the students' contributions to the focus group interview added in-depth and detailed oral information. The responses to the scaled questionnaire were taken into account when developing the questions for the focus group interview. Both groups of questions targeted the students' perceptions about the benefits of reflection on their senses of self-worth and belonging as well as acceptance.

The questions related to the sense of acceptance were considered important for two reasons. First, the feelings of being accepted are directly interconnected to the feelings of self-worth and of belonging, because when one feels accepted one's senses of self-worth and belonging increase. Second, acceptance had been such a concern during the preliminary study that students had focused on developing more accepting behaviors and gaining greater acceptance. The teacher-researcher had observed distinct improvement in the levels of acceptance displayed by students; however, what triggered these changes remained to be established.

Although all eight students completed the scaled questionnaire at the beginning of Week 13, only five took part in a focus group interview at the end of the same week. Whereas the scaled questionnaire required students to rate the perceived effect of reflection on their senses of self-worth and belonging, the interview enabled students to express what was most important to them and to provide comments far beyond a single-digit answer. For the scaled questionnaire, the data collected were sorted using the sum of numerical responses. For the interview the transcript was margin-coded and classified before being rank-listed and tabulated.

The students' descriptions of their perceptions were vital in this study because the objective was to understand the meaning of the experience. This choice of research perspective was in line with the current belief that human encounter cannot be explained by numbers only; that educational research is best served by an environment that allows for descriptions and words rather than numbers exclusively (Merriam, 1988; Robson, 1996; Stake, 1978). Providing an understanding that cannot yet be logically explained, the study of participants' perceptions of their experiences assists both researcher and readers in their construction of knowledge (van Manen, 1990). This is not to say that quantitative instruments should be forgotten; on the contrary, numbers can quickly provide information that in turn can be used to give direction and purpose to qualitative instruments; qualitative and quantitative methods can constructively complement each other (Denzin & Lincoln, 1994; Robson), as was the case in this study.

Limitations

The limitations of the methods require consideration because they affect not only the findings of this study, but also the planning of future research. By limiting the investigation to one class cohort of STEPS students and to the first half of the 26-week course, a higher than anticipated attrition rate not only influenced the sample size, but also affected the findings beyond expectations.

Whereas the retention rate for this course averaged 78% over five years, it was only 48% for the chosen class cohort (T. O'Donnell, personal communications, November 2, 2005, October 27, 2005). Originally, the sample chosen for participation in this research comprised a class cohort of 29 mature-age students undertaking a 26-week, part-time STEPS course. The course attracts a clientele looking for a new direction and a fresh start. For a number of reasons, about 50% of the students attended the weekly classes irregularly for the first 10 weeks of the course before withdrawing.

Attrition affected the number of students participating in the group interview. As a result, these five students were not representative of STEPS students

as a whole. Instead, they characterized successful STEPS students, a minority of students albeit of varying backgrounds and with varying levels of academic achievement.

Results

The research presented here provides evidence that group processing in a cooperative learning environment helped students express their affective needs and monitor their behaviors and achievements in terms of these needs. The results of the preliminary study indicated that group processing encouraged students to hone their social and organizational skills, namely, listening, staying on task, participating, and communicating. The results of the preliminary study contextualize the main study.

The main study demonstrates that the participants perceived reflection as contributing to the satisfaction of their needs for self-worth and belonging and, unexpectedly but importantly, to those for acceptance. After looking at the results of the scaled questionnaire across the 10-point scale (see Appendix D2), it was felt that the discrimination in how the patterns were distributed would not be lost if the responses were combined (see Appendix D3). The ensuing results indicate that seven out of eight students perceived reflection as helping them become more accepting and as contributing to their personal achievements. Further, five out of eight students perceived reflection as helping them become more valuable group members; as contributing to the group achievements; and as influencing their sense of belonging to the group. The results of the scaled questionnaire required clarification and in-depth understanding; hence these guided the formulation of the interview questions with those of the scaled questionnaire, the findings of which are discussed in the following section.

Discussion of the Findings

Analysis of the findings indicates that reflection assisted students to modify their behavior and develop interpersonal skills with regard to satisfying their needs for acceptance. The implication for STEPS teachers might be greater than for other teachers as the STEPS students in this study displayed extremely high needs for acceptance, possibly because of past schooling years during which they may have experienced academic and social difficulties. The satisfaction of the need for acceptance also emerged as a possible condition for the satisfaction of other needs such as those for self-worth and belonging.

These findings are considered according to the needs first for acceptance, then for self-worth and belonging as per the two research questions. Although acceptance was not a distinct research question, it deserved to be privileged with a section of its own rather than with a subsection of self-worth and belonging. Furthermore, the strong evidence in this study that acceptance was more important than self-worth or belonging justified that it be discussed first.

Acceptance

In the questions on the scaled questionnaire, acceptance was originally incorporated into the needs for self-worth and belonging, but the responses to the scaled questionnaire clearly indicated that students perceived reflection as benefiting the development of acceptance more than it did their feelings of self-worth and belonging. The prominence not only of the students' feelings of

acceptance, but also of their perceptions of the effect of reflection on these feelings was an unanticipated and exciting outcome of the study.

The responses to the scaled questionnaire, which showed that students generally felt well accepted and perceived themselves as accepting others, mean that a high level of acceptance was demonstrated in the learning environment. As the responses also indicate that students perceived reflection as influencing their ability to accept others, one might consider that the students' abilities to accept others and feel accepted increased throughout the duration of the investigation. The teacher's observations and communications with students also support this conclusion.

With regard to the levels of acceptance displayed in class, the students' progress in the early stage of the investigation can be linked to how the teacher promoted the development of a supportive, cooperative learning environment. The teacher's expectations and reasons for choosing such an approach were communicated clearly to the students throughout the first few weeks of the course and constituted a firm base for students' behaviors and attitudes. The notions of supportive environment and behaviors were discussed, specific behaviors were targeted, goals were set, and the necessary interaction skills were practiced during classes. This was followed by guided reflections, after which students shared their thoughts with the rest of the class. In some cases reflection served as a mediator between students. As a result, students were able to communicate better and became more accepting.

The focus group interview provided further evidence of the students' increased levels of acceptance, as demonstrated by the following interview statement.

In the group I wasn't even aware that I wasn't listening until someone pointed that out [during reflection] ... And so I was then able, the next time in the same group, to sit back and listen and wait until everybody else had had their say before I put my piece. And that's helpful to me because I really needed to practice that.... [Now] we are all relating much better and we are all able to express our opinions better.

Thus there is evidence that reflection contributed to the improvement of students' interaction competences in general and listening skills in particular, which is consistent with current theories and the research findings of Bellanca (1992), Cohen (1986), Hubert and Eppler (1990), and Kagan (1994).

Reflection also helped students realize that they could grow together and learn from each other as testified by the following interview extract: "[During reflection] you do hear other people's viewpoints, and also, hmm, sometimes it is the way they have gone about it; you can learn from the way they have done the task." This idea of cooperative learning, as opposed to individualistic or competitive learning, was shared by other students and supports the idea that students were ready to listen to, and learn from, each other and that they perceived reflection as pivotal in the development of their acceptance of the other group members as learning partners.

The outcomes of reflection can be presented as self-knowledge and self-acceptance at the first level and acceptance of others at the next level. In sum, for most of the students the perceived overall benefit of reflection was primarily the satisfaction of their needs for acceptance.

Self-Worth and Belonging

The findings relating to each of the two research questions, the first about the senses of self-worth and the second those of belonging, share several commonalities. For effectiveness purposes, the results for both feelings are treated together.

Although some students perceived that reflection benefited their feelings of self-worth and belonging, it seems that others did not perceive reflection as influencing their senses of self-worth and belonging, perhaps because the latter students were focusing on the satisfaction of their need for acceptance. Teachers have long recognized and accepted that students' needs vary from one individual to another and that the needs of one person change over time and from one situation to another.

The focus group interview revealed that although students saw reflection as improving their senses of achievement, most of them did not see reflection as influencing their senses of self-worth. This apparent inconsistency between the students' perceptions of their senses of achievement and self-worth can be explained by the following interview extract: "that's probably just because the way I feel about myself; I don't have that much confidence within myself and I think that's probably because I am afraid of the failure." Reflection helped the student become aware of one of the causes of her self-doubt: fear of failure and lack of self-confidence.

One student, who reported spending much time reflecting and who perceived reflection as increasing her senses of self-worth and belonging, offered this contribution.

[With reflection] you become more aware of, not only your own value but everybody else's value ... that's like ah, yes, OK, I'm getting there, I'm getting better and my value is increasing to the team and so is theirs.... Because you feel valuable, if you like, it increases that sense of belonging to that team, or that group.

The above comments from two students, whose senses of self-worth perceptions of the effect of reflection on their sense of self-worth differed considerably, highlight the fact that the outcomes of learning experiences vary from student to student. Further, they are a reminder that some students require time to develop self-belief and self-confidence. Hence factors that may contribute to students' perceived senses of self-worth and their perception of the influence of reflection on these feelings require further examination and might give direction to future studies.

Conclusions and Implications for Teaching and Research

The major outcome of this study was that the students' needs for acceptance were unexpectedly high. Not only were most students longing to feel accepted by the other class members, but they also made their need for acceptance explicit. The findings revealed that these students felt that their needs for acceptance had been met and that they perceived reflection as having influenced their feelings of being accepted. The unanticipated prominence not only of the students' needs for acceptance, but also their perceptions of the effect of reflection on these feelings could give direction for future research and classroom practice. The emergence of acceptance as such an important variable

also highlights the importance of students' perceptions. It is a good reminder that teachers ought to take students' perceptions into account when planning future learning activities instead of relying solely on their knowledge and observations.

As for future studies, first, there is a need to address issues of reliability. The findings present acceptance as such an important need of students that it deserves pursuing. To this effect, it is necessary to establish the reliability of the instruments used to measure students' perceptions of the efficacy of group processing on their senses of acceptance, self-worth, and belonging. A larger sample size together with a sufficient number of items would provide the opportunity to test the reliability of the scaled questionnaire.

Second, a critical implication for researchers may be the length and timing of research projects. Studies similar to this investigation and conducted early in the course could be important because feelings of self-worth and belonging may figure more prominently in the high attrition rate sample than with students who have persevered for longer. These types of studies, therefore, could help to reduce attrition rates.

In sum, the aim of this study, which was to ascertain the students' perceptions of the effect of reflection on their senses of self-worth and belonging, contributes to research in the area of cooperative learning and students' needs in important ways. The study isolated the need for acceptance as a need when preuniversity, mature-age students aim to develop a cooperative learning environment, that could possibly take precedence over the needs for self-worth and belonging. This is in line with Kunc's (1998) belief that in some settings one must earn the right to belong through one's achievement; in others the right to belong hinges on participation. That is, students' need to belong is met when they are "accepted as they are" (p. 8). This distinction bears relevance for educational settings comprising primarily students who have not yet experienced academic success as they might have experienced rejection in previous settings because of their lack of achievement.

Furthermore, students perceived that group processing influenced the satisfaction of their needs for acceptance. Assuming that the satisfaction of the needs for self-worth and belonging is a condition for effective learning and teaching, the outcomes of this study, therefore, suggest that the satisfaction of students' needs for acceptance may be a vital ingredient of effective learning and teaching. In addition, the satisfaction of the need to belong appears to precede that of self-worth, which is in accordance with needs theory. The outcomes of this study also bear questions such as whether acceptance is one of several factors affecting the sense of belonging and what the other factors are likely to be. Further research into cooperative learning, and group processing in particular, with regard to acceptance and belonging in the realm of needs theory is likely to be worthwhile.

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Appendix A
Research Design of the Preliminary and Main Studies

<i>Time allocation</i>	<i>Stages and method of data collection</i>	<i>Students skills/competences to be developed</i>	<i>Learning strategy</i>
<i>Preliminary study</i>			
Weeks 1, 2	<i>Stage One</i> Weekly guided journal entries	<ul style="list-style-type: none"> ■ Set, implement, evaluate and review goals • Develop supportive behaviors 	Think-Pair-Share (TPS) on finding and writing topic sentences
Week 5	<i>Stage Two</i> Group processing open questions	Develop and practice: <ul style="list-style-type: none"> ■ Group roles ■ Group processing skills • Supportive behaviours 	TPS and Pair-Compare (PC) on Ways of organizing text: Classification
Weeks 11, 12	<i>Stage Three</i> Group processing question sheet	<ul style="list-style-type: none"> ■ Plan and prepare a group presentation ■ Evaluate and reflect ■ Plan and manage group work • Supportive behaviors 	Group Investigation (GI) on reading techniques
<i>Main study</i>			
Week 13	Scaled questionnaire Focus group interview		
Key to symbols: • interaction skills ■ organizational skills			

Appendix B
Overview of Instruments, Time Frame, and Methods of Analysis of the Preliminary and Main Studies

<i>Instrument/Means</i>	<i>Time frame</i>	<i>Methods of analysis</i>
<i>Preliminary study</i>		
Journal entries	Entries made at the beginning and end of two lessons in weeks 3 and 4	Margin coding based on key-words list (see Table 3), which was created after extensive literature review and data examination
Open questions	Completed at the end of week 7	Compilation of inventory of key words/phrases
Question sheet	Completed during week 12	Search for relationships and reflection
<i>Main study</i>		
Scaled questionnaire	Completed at the beginning of week 13	Sum of numerical responses
Focus group interview	Carried out at the end of week 13	Transcript Margin notations Summary Search for relationships/explanations

Appendix C
Stage Three Group Processing Question Sheet

Questions—Part A

1. What was the activity about?
2. What were the group goals?
3. How well did the group achieve each goal?
4. What factors influenced the outcomes of your group work?
5. How do you feel about what happened in your group today?
6. What could the group do better in the future?
7. What points does the group see as (a) strengths, (b) weaknesses?
8. What are the group goals for the next sessions?

Note. Question 1 was to lead students in the group processing task, to orient them. The responses have no significance for this study.

Questions—Part B

9. What was your role during the session?
10. What things did you do in your group that helped you to be successful?
11. What things did you do that made it harder?
12. What are your strong points as a group member?
13. What do you perceive as your less strong point as a group member?
14. What are your individual goal(s) for the next sessions?

Appendix D1
Scaled Questionnaire

Student code:

Date:

You have participated in several co-operative learning activities of the Think-Pair-Share and Pairs-Compare type including reflection on how the group worked together. Now is a good time to evaluate such learning/teaching practices. On a scale of 1-10, where 1 is the lowest, indicating not at all, and 10 the highest, indicating strongly, circle the alternative which most reflects your perception of the situation.

	Not at all									Strongly
	1	2	3	4	5	6	7	8	9	10
1. To what extent do you perceive yourself as a valuable group member?	1	2	3	4	5	6	7	8	9	10
2. To what extent do you feel the reflections have helped you become a more valuable group member?	1	2	3	4	5	6	7	8	9	10
3. To what extent do you feel the reflections have helped you become more/less accepting (more/less tolerant) of others?	1	2	3	4	5	6	7	8	9	10
4. To what extent do you feel the reflections have contributed to your personal achievement?	1	2	3	4	5	6	7	8	9	10
5. To what extent do you feel the reflections have contributed to the group's achievement?	1	2	3	4	5	6	7	8	9	10
6. To what extent do you feel that you are part of the group?	1	2	3	4	5	6	7	8	9	10
7. How well do you feel accepted by the group members?	1	2	3	4	5	6	7	8	9	10
8. How well do you accept the other group members?	1	2	3	4	5	6	7	8	9	10
9. To what extent do you perceive the reflections as influencing your sense of belonging to the group?	1	2	3	4	5	6	7	8	9	10

Appendix D2
Sum of Numerical Responses – Scaled Questionnaire (8 students)

<i>All Questions</i>	<i>Responses and Number of occurrences</i>									
	1	2	3	4	5	6	7	8	9	10
<i>Self-worth questions</i>										
1. To what extent do you perceive yourself as a valuable group member?	1			1	1		2		1	2
2. To what extent do you feel the reflections have helped you become a more valuable group member?	1	1		1		1	1		2	1
3. To what extent do you feel the reflections have helped you become more/less accepting (more/less tolerant) of others?	1					2		2	1	2
4. To what extent do you feel the reflections have contributed to your personal achievements?	1					1	1	3	1	1
5. To what extent do you feel the reflections have contributed to the group achievements?	1		2			1	1		3	
<i>Belonging questions</i>										
6. To what extent do you feel that you are part of the group?		1		1			3		2	1
7. How well do you feel accepted by the group members?				1			2	3		2
8. How well do you accept the other group members?			1				2	2	1	2
9. To what extent do you perceive the reflections as influencing your sense of belonging to the group?	1	1	1		2	1	1			1

Appendix D3
Summary of Numerical Responses – Scaled Questionnaire (8 students)

<i>Reflection-focused questions only</i>	<i>Combined Responses and Number of Occurrences</i>		
	1-4	5	6-10
<i>Self-worth questions</i>			
2. To what extent do you feel the reflections have helped you become a more valuable group member?	3		5
3. To what extent do you feel the reflections have helped you become more/less accepting (more/less tolerant) of others?	1		7
4. To what extent do you feel the reflections have contributed to your personal achievements?	1		7
5. To what extent do you feel the reflections have contributed to the group achievements?	3		5
<i>Belonging question</i>			
9. To what extent do you perceive the reflections as influencing your sense of belonging to the group?	3		5