

Running Head: Peer Support: Context, Process and Outcomes

Title: Peer Support: Relations between the context, process
and outcomes for the students who are supported

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Abstract

In this paper an investigation of the outcomes of a Peer Support scheme for the students who are supported is reported. It was found that attendance at peer learning was positively and significantly correlated to academic performance. This relationship was found even when prior levels of academic performance were controlled for. However, it was also found that students who attended peer learning adopted statistically significant less meaning orientated approaches to studying over the course of the academic year. It is argued that this is an indication that the quality of the learning of these students fell. Qualitative evidence suggests that this change in approach was in response to an increased awareness of the assessment demands of the course and that these students had become more strategically orientated in their approach to studying as a result of their attendance at Peer Support. It is argued that these results suggest that the outcomes and operation of this Peer Support scheme were influenced by the context in which it operated. Two implications of these findings are discussed.

Key Words

Peer Learning

Peer Support

Supplemental Instruction (SI)

Approaches to Studying

Further Education

Peer Support: Relations between the context, process and outcomes for the students who are supported

The aim of this study was to investigate the approaches to studying and the academic outcomes of students who were supported in a Peer Support scheme. The effects of the context, particularly of assessment, on the processes and outcomes for these students of this Peer Support scheme were also examined with the aim of gaining some insight into the nature of the learning that could be expected in Peer Support schemes of this sort.

Defining terms

Peer learning is used here as a generic term which refers to situations where students support each other in educational settings. Other authors have used terms such as 'Peer Tutoring' (Goodlad and Hirst 1989, Topping 1996), and 'Peer Teaching' (Goldschmid and Goldschmid 1976, Whitman 1988). The term 'peer learning' is used to emphasise the experience of all students participating. Two forms of peer learning, Supplemental Instruction (SI) and Peer Support, are considered in this paper. Although peer learning involves students who support other students, it is the impact of peer learning on the students who are supported that is the focus of this paper. The impact of peer learning on the students who offered support in this context is considered in Ashwin (in press).

A summary of past reviews of the research into the effectiveness of peer learning

Peer Support, the peer learning scheme reported in this paper, was based on Supplemental Instruction (SI). SI is a form of peer learning that was first established at the University of Missouri, Kansas City in 1973 (see Blanc et al. 1983, Martin and Arendale 1993, Center for Supplemental Instruction 1998). In SI, the peer learning

sessions take place outside the mainstream curriculum with the SI users' attendance at the sessions being voluntary. The role of the peer facilitator (SI leader) is to facilitate discussion of the course material between the students whose learning is facilitated (SI users) rather than to lecture to them. The SI user's role is, therefore, to take an active part in providing the material for the session, whilst the SI leaders are responsible for structuring the discussion.

The US research suggests that SI users gain higher mean grades than non-users (Lundeberg 1990, Bridgham and Scarborough 1992, Congos and Schoeps 1993, Kenney and Kallison 1994). This is found even when previous academic achievement and ethnicity (Center for Supplemental Instruction 1998), and double-exposure to the course material (Kenney 1989) are controlled for. The evidence from Europe and South Africa is less strong but suggests that those students who attend SI do better than those students who do not (Rye et al. 1993, Bidgood 1994, Healey 1994, Price and Rust 1994, 1995, Bryngfors and Bruzell-Nilsson 1997, McCarthy et al. 1997).

There are two issues with the way this research is reported that have led to a lack of consideration of the impact of the context in which SI schemes operate on the process of the schemes and their outcomes. First, it is usually assumed that the SI schemes operate in the way that the implementer initially planned them, in terms of the structure of the sessions and the nature of the interaction between the students involved in them. The studies cited above simply include a generic description of an SI session, such as "The SI leader facilitates the discussion so that students can make adjustments, discuss what they

do not understand and discover strategies for mastering difficult material” (Center for Supplemental Instruction 1998), without investigating the actual processes within the sessions. Whilst more qualitative studies have considered the interaction between SI leaders and SI users (Lundeburg and Moch 1995), and how SI operates in particular subject areas (McMillin 1993, Burmeister et al. 1994, Zerger 1994), these studies have not investigated student outcomes. Second, the focus in these studies has been on the improvement in students’ academic performance. There has been no consideration of the ways in which students are assessed and whether an improvement in students’ academic performance is also an indication of an improvement in the *quality* of students’ learning, partly because this relationship can only be investigated in a single context. This study attempts to address these issues by examining the way in which a Peer Support scheme operated, examining the quality of the learning of the students supported, and by examining the effect of the context on the process and outcomes of Peer Support for the students supported by the scheme.

Research methods

The form of peer learning, Peer Support, which was the focus of this research, operated on a two year ‘A’ level science course at an inner-city further education college from October 1997 to May 1998. It was based on SI, with second year students, Peer Supporters, taking on the role of SI leaders and the support being offered to first year students who took on the role of SI users. Support was offered in Chemistry and Pure Mathematics and Statistics.

The research triangulated methods to examine the extent to which students with particular levels of prior academic achievement and approaches to studying used Peer Support and the relation between attendance at Peer Support and students' academic performance and approaches to studying at the end of the academic year. The outcomes were related to the actual structure of the Peer Support sessions, feedback from the Peer Supporters, and the assessment methods of the course, to examine the relations between the context in which this Peer Support scheme operated, the way in which it operated, and its outcomes for the students who were supported.

Students' previous academic performance and performance in their end of year examinations

The relationship between students' previous academic performance and their levels of attendance at Peer Support was examined using the first year students' GCSE results. Rather than including all their GCSE results in this analysis, it was narrowed to their performance in the following: Mathematics, Science subjects (whether this be single Science subjects like 'Chemistry' or the Science double award which covers all the Science subjects), and English Language. These are referred to as 'MSE GCSEs' and were used because there was a significant and strong positive correlation between the MSE GCSE score and students' performance in their Chemistry and Pure Mathematics and Statistics promotional examinations, which they sat at the end of their first year of 'A' level study (Chemistry, $r = +0.57$. $N = 44$, $p < 0.001$; Pure Mathematics and Statistics, $r = +0.50$. $N = 23$, $p < 0.01$). Students with overseas qualifications were not included in this analysis. GCSE scores were available for 49 out of the 52 students who were studying first year Chemistry and/or Pure Mathematics and Statistics. The prior academic

performance of the students was also examined by splitting the students into two groups. The first, Peer Support Users, was defined as those students who attended five or more sessions, and non-Peer Support Users as those students who attended less than five sessions. Five sessions was chosen because evidence from the SI literature suggests that that is the minimum required for SI to have any positive impact on student performance (see McCarthy et al. 1997).

The first year students' performance in their end of year promotional examinations in Chemistry and Pure Mathematics and Statistics were also examined. Spearman's rank order correlation were used to examine if the students who attended more Peer Support sessions achieved higher marks in their end of year Chemistry and Pure Mathematics promotional examinations.

Approaches to studying questionnaire

Richardson's (1990) version of the Approaches to Study Inventory (ASI) (Entwistle and Ramsden 1983), the Approaches to Studying Questionnaire (ASQ) was used to measure the extent to which students adopt a meaning and a reproducing orientation in their studies. Richardson (1990) found that this was "reliable and replicable, and can be recommended for use in future investigations into student learning" (p. 165). It can be seen as a measure of the quality of students' learning because meaning orientated approaches to studying lead to higher quality learning than reproducing orientated approaches to studying (for example see Kember et al. 1997).

The first ASQ was distributed to students studying Chemistry and Pure Mathematics and Statistics in October 1997. The response rate was 73%. The students' meaning and reproducing scores on their first ASQ were examined to see if there was a relationship between these and their levels of attendance at Peer Support. The second ASQ was completed in June 1998. In total, 35 students completed the first and the second ASQ, an overall response rate of 67%. In both cases, the questionnaire was distributed and completed during students' lessons. A comparison of the prior educational attainment and result in the end of year examination, between those students who completed both ASQs and those students who did not, revealed no statistically significant differences between the groups using a Mann Whitney test. Thus, on the measures used in this study there appeared to be no systematic differences between those students who completed both of the ASQs and those who did not.

The measurements from the ASQ were taken to examine whether there was a relationship between *changes* in the students' scores on their second ASQ, compared to their first, and their level of attendance at Peer Support. A similar questionnaire has been used by Kember et al. (1997) to evaluate other educational innovations in terms of increasing students' participation in their learning experience. The change in students' meaning and reproducing orientation scores were analysed using a Wilcoxon Signed Ranks test and, as with previous academic achievement, dividing the students into groups of Peer Support Users and Non-Peer Support Users.

Observation of Peer Support sessions

Three of the Peer Support sessions were observed over the academic year, one session in November 1997, one in February 1998, and one in May 1998. The purpose was to examine the nature of the interaction between the Peer Supporters and the students supported. The students attending these sessions differed with 17 students attending the first session observed, 25 the second observed, and 20 the final session. However, 13 of the students attended all three of the sessions that were observed. This suggests that it is possible to compare how the interaction between the students and the Peer Supporters developed over time, rather than differences in the sessions being due to differences in the students attending.

Focus group with Peer Supporters

A focus group discussion was conducted with four of the five Peer Supporters. The Peer Supporters discussed a series of questions relating to their experience of acting as Peer Supporters and the experience of the first year students. To allow for the possibility that some students might not express their opinions in full in a group setting, the students then wrote individual responses to the questions. The discussion was recorded and transcribed verbatim. The quotes from the discussion in this paper were selected on the basis that they represented views that were expressed consistently in the discussion and in the peer facilitators' individual responses to the questions.

Examination of Peer Supporters' journals

During their time as Peer Supporters, the students kept a journal of each of their sessions. This has been done in previous studies on peer learning (Lundeberg and Moch 1995,

Johnson 1995). In their journals the Peer Supporters were asked to analyse what they planned to do in their sessions, what they felt actually happened in the sessions, and what they would like to improve in subsequent sessions.

Peer Support on the first year of 'A' level Chemistry and Pure Mathematics and Statistics

Before examining which students used Peer Support and whether these students seemed to gain from their involvement in Peer Support, the way in which it actually operated is examined. This is important in examining whether the apparent outcomes of Peer Support can be reasonably argued to have been due to the type of activity and interaction that actually occurred in the sessions. It is important to note that it is the *actual* interaction rather than the planned interaction that is to be examined. This will also give an indication of how the sessions developed over time.

Five Peer Supporters were trained in October 1997 to offer support to the 52 students studying first year Chemistry and/or Pure Mathematics and Statistics. The Peer Support sessions took place during the free time of both the groups of students and the first year students' attendance at each of the sessions was voluntary. The Peer Supporters ran 34 sessions; 44 students attended at least one session, 24 of these attended at least five times, and 19 attended at least ten times. In terms of attendance per subject, 19 of the 47 students studying Chemistry attended at least five times, and 16 of the 25 students studying Pure Mathematics and Statistics attended at least five times. The average attendance at the sessions was 19.8 students.

It is important to note that the approach to training the Peer Supporters differed from that of training SI leaders, where the focus is on training students in particular group work techniques (Center for Supplemental Instruction 1998). Instead, based on several years experience of running peer learning in the college, students were introduced to, and discussed, their role as Peer Supporters and their views of how to best support their fellow students. They each ran a practice Peer Support session and discussed how they would run their first sessions. They worked with their own models of how they would run their sessions; the idea was that these would be discussed and developed over time in the weekly meetings involving the author and the Peer Supporters. At the end of the training it was agreed that the Peer Supporters would organise the sessions so that they worked in one large group. It was also agreed that they would discuss particular concepts that students had recently been taught and were finding difficult to understand. However, as they ran the sessions, the Peer Supporters found that more students would attend if they focused on getting the students to discuss how to answer past examination questions and if they split the large group into smaller groups of students who were interested in discussing the same questions. In the sessions that were observed, the small groups of students attempted a series of past examination questions on their chosen topics that were provided by the Peer Supporters. The Peer Supporters and students who attended Peer Support appeared to change their understanding of their roles over the three sessions that were observed. In the first session observed the students were reluctant to talk and when they did they addressed all their comments to the Peer Supporters. In the later sessions the students would discuss the questions with each other once the Peer Supporters had initiated the discussion.

Examples of how two of the Peer Supporters' journals changed over time demonstrate how their perception of the participation of the students who were supported changed over time. These were representative of the journals kept by the five Peer Supporters. After the second session, on the 16th October 1997, the Peer Supporters focused on two improvements:

“Getting everyone to participate and co-operate.” (Arvinder¹, Session 2 Journal, 16/10/97)

“Trying to get them to listen to each other and co-operate instead of talking all at once. Try to get the quieter students more involved somehow. They sit and watch but don't take part. I think they're unsure of the answers and don't want to be wrong.” (Sajida, Session 2 Journal, 16/10/97)

The Peer Supporters' journals suggest that they overcame the problems of participation and co-operation relatively quickly. This was illustrated by the entries in the 'What did you do well?' section of their journals:

“Got everyone to participate, even the quiet ones. Also got the louder, more confident students to show respect to students who did not understand first time round.” (Arvinder, Session 5 Journal, 13/11/97)

“They also learnt about working together as they took it in turns to answer questions. I think that this was the best session I had so far, as usually I have

to keep asking questions and lead discussion but today they were working and talking amongst themselves.” (Sajida, Session 7 Journal, 27/11/97).

In their focus group discussion the Peer Supporters confirmed the way in which the students who attended Peer Support and their understandings of the sessions developed over time. However, in this discussion they suggested that it took longer than was implied in their journals.

Sajida and Arvinder outlined in the focus group discussion how the students who attended Peer Support initially came looking for answers, and the Peer Supporters responded by talking for most of the sessions:

“Sajida: I thought we were teaching them a lot more in the beginning. If they didn’t understand something in the class they wouldn’t ask [the teachers] for help, they would come to us. So in the beginning we used to talk continuously for an hour and it was really tiring.

Arvinder: They thought the whole point of this Peer Support was for us to teach.”

The Peer Supporters explained how they developed the sessions to be more interactive, and how the students who attended Peer Support began to understand that the Peer Supporters were not teachers:

“Sajida: I think after Christmas we said ‘You have to at least try and read it up yourself rather than coming straight to us’ . . . We asked them to explain it to the others, rather than us explaining it to them.

Javid: Some of them understood it more than others and they wanted to just go on and [in the later sessions] they realised they just couldn’t go on at their own speed, that they had to be more tolerant of others.

Arvinder: We were always asking the not so confident person to talk and said ‘hold on there’ to the others, ‘we know you know it so slow down and give the others a chance’.

Tunde: I think they got to understand what a Peer Support leader was. They didn’t understand it as first. I think they got to understand that we are not teachers, we are just second year students.”

To conclude this section, the observation of the Peer Support sessions and the focus group discussion with the Peer Supporters suggest that the sessions differed from the way they were initially planned. Rather than being focused on the discussion of difficult concepts, they appeared to be focused on discussing how to answer past examination questions. The sessions developed over time. The initial sessions involved the Peer Supporters providing answers, whereas in the later sessions the students who attended Peer Support shared their understanding of the examination questions with one another, with the Peer Supporters giving these discussions structure and focus.

The relationship between students' prior academic achievement, approaches to studying and their levels of attendance at Peer Support

These relationships were investigated because it could be argued that the students who are willing to spend time attending activities such as Peer Support will be the more able students or students who have more meaning orientated approaches to their studies (for example, see Norton and Crowley 1995 on the types of students who attended learning to learn workshops). However, there was not a significant correlation between students' mean MSE GCSE scores and their attendance at Peer Support ($r = +0.15$, $N = 49$, $p > 0.10$). Equally, there was no statistically significant relationship between students' meaning and reproducing orientation scores at the beginning of the academic year and their attendance at Peer Support, although there is a weak correlation suggesting that the more students attended Peer Support, the lower their reproducing orientation scores (meaning orientation score $r = -0.02$, $N = 38$, $p > 0.10$; reproducing orientation score $r = -0.25$, $N = 38$, $p > 0.05$).

The relationship between students' academic performance at the end of the academic year and their levels of attendance at Peer Support

There were statistically significant positive correlations between students' attendance at Peer Support and their performance in the end of year examinations (Chemistry, $r = +0.30$, $N = 47$, $p < 0.05$; Pure Mathematics and Statistics, $r = +0.56$, $N = 25$, $p < 0.005$).

Table I shows the correlation between first year students' attendance at Peer Support and their performance in their Chemistry and Pure Mathematics and Statistics Promotional

examinations for the Top 25%, middle 50% and bottom 25% of students based upon their ability as measured by their MSE GCSE scores.

TABLE I ABOUT HERE

It shows that there are significant positive correlations between students' attendance at Peer Support and their marks in the Chemistry Promotional examination at all three levels of ability, as measured by previous academic achievement. This shows that at all levels of ability range the more Peer Support sessions students attended, the better they performed in their end of year examination. In the Pure Mathematics and Statistics examination it is the students who are in the middle 50% and top 25% for whom there is a significant positive correlation between attendance at Peer Support and their performance in the end of year examination. The correlation between attendance at Peer Support and the marks for the Pure Mathematics and Statistics examination for the bottom 25% of students is positive, though it is not significant. Thus, it is likely that, at all levels of previous academic achievement, the more Peer Support first year students attended the better they did in their end of year examinations.

The relationship between students' approaches to studying at the end of the academic year and their levels of attendance at Peer Support

Students' scores on the ASQ were used as a measure of the quality of students' learning in this study. In theory, Peer Support could have helped students to develop their approaches to studying and improve the quality of their learning for two reasons. First, it could help to prevent negative attitudes to study and help those supported to organise

their study methods. Some argue (Clarke 1986, Watkins and Hattie 1985) that it is these elements of the reproducing orientation that have the largest negative effect on the quality of learning. Second, Ramsden et al. (1989) found that educational institutions in which students felt there was supportive teaching, coherent structure, an emphasis on autonomy and a moderate stress on achievement, tended to produce students who took a more deep approach to learning, which is part of a meaning orientation. Peer learning can be seen as a way of promoting a supportive environment and so in this way may help students to be more meaning orientated in their learning and so improve the quality of their learning.

Contrary to this theory, there was a small, but statistically significant, fall in the mean of the Peer Support Users meaning orientation scores from 60.1 to 57.2 ($T = 34.5$, $N = 18$ $p < 0.05$). There was no significant change in their reproducing orientation, or the meaning and reproducing orientation of the Non-Peer Support Users.

Relating the Context, Process and Outcomes of Peer Support

The statistical evidence has suggested that the more students attended Peer Support, the better they did in their end of year examinations. This relationship was found even when prior levels of academic achievement were controlled for. However, there is also evidence that the quality of students' learning, as measured by their approaches to studying, fell slightly. Relating the context in which this Peer Scheme operated to the processes and outcomes of Peer Support offers an explanation for this apparent contradiction. This is that the students took a more strategic but less meaning orientated approach to their learning. Entwistle (1997) describes this as an "intention to achieve the

highest possible grades, while the process depended on cue seeking, well organised study methods and effective time management” (p.19).

The Peer Support sessions were consistent with Entwistle’s definition. They focused on supporting students in practising past examination papers. This was a change from the original focus sessions, which was to be on discussing difficult concepts. This change appeared to occur because this is what the first year students wished to discuss in the sessions. The first year students’ promotional examinations, as with the actual ‘A’ level examinations, had question topics and formats that were repeated over the years. This meant that learning to tackle the types of questions that would be set in an examination, rather than seeking a deep understanding of the course content, could be a successful approach to studying the course. The data from the focus group with Peer Supporters offered support for this interpretation of the statistical evidence. The Peer Supporters felt they had helped the students who attended Peer Support to become aware of how to approach the course and how to tackle past examination papers. It appears that they were helping the students who attended Peer Support to understand the cues of their teachers and the assessment methods:

“ Javid: They did not have much of an idea about the syllabus...

Tunde: At first they didn’t really ask us for past papers but once they knew what Peer Support was they knew they could come and ask us for past papers.

Arvinder: It’s good to get it started off straight away rather than just learning [examination] technique at the end. During the two years you need to learn the

technique itself. Having knowledge is one thing but knowing what they want, the examiners themselves, that progresses over the two years.

Sajida: A lot of them didn't really know about past papers or where you can get them or anything.

Tunde: Some of them didn't really know what the course was like.

Sajida: 'Cause going from GCSE to A level is a really big jump and its a lot harder and you've got to do a lot more work, there are a lot doing it just how they did it at GCSE."

This focus on examinations was emphasised by one of the Peer Supporters in the focus group discussion when he was comparing Peer Support with teaching.

"Arvinder: Talking amongst yourselves develops ideas [but] you need something to trigger it off and that's usually teachers themselves. You need that introduction, you need that background. You need to know what you are doing before hand; you can't just talk about anything. You've got to relate it back to the syllabus, relate it back to work. At the end of the day you're doing your exams, you're not discussing."

If the students who attended Peer Support became very focused on using examination papers and the books that the Peer Supporters recommended then it seems likely that they became less questioning in their approach to the course. It appears that it was the structure of the course, and particularly assessment procedures, that led to the focus on past papers that was observed in the sessions. Sessions of this type would encourage

students to adopt an approach that would secure success in examinations at the cost of deeper understanding of the material they were studying. This suggests that the process and outcomes of this Peer Support scheme were affected by the context in which it was operating.

Conclusions

In this paper, a form of peer learning appeared to be effective in improving students' academic performance on an 'A' level Science course. The context in which the form of peer learning operated also appeared to influence its process and outcomes. If these findings were confirmed in other contexts and in relation to other peer learning schemes, then this would have two implications for those interested in peer learning. First, it would suggest that in researching different forms of peer learning it is essential to collect and triangulate a variety of quantitative and qualitative data in order to gain insight into the context in which forms of peer learning operate. Any data on students' academic performance would need to be related to the operation of the form of peer learning, students' experience of that form of peer learning, the type of course that is being studied, and the quality of students' learning in order to gain a fuller picture of what is happening in each particular context. Second, it would suggest that whilst peer learning can improve students' academic performance, it works by helping students to come to terms with the demands of their courses. It reflects the demands of these courses and cannot be expected to produce radical changes beyond these courses' learning outcomes. Thus peer learning could never be a panacea for poorly designed courses and assessment systems but rather would be an effective way of helping students to succeed in meeting the demands of their courses.

However, this was a single study of one form of peer learning in one context. Several factors such as the impact of students' motivation on their use of Peer Support were not examined in this study. It is clear that further studies of the relationship between different forms of peer learning and their contexts are needed, if we are to understand further the influence of the teaching and learning context on the operation of peer learning.

Notes

1. All of the names of students that are used in this article are pseudonyms.

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Table

			Attendance at Peer Support	
Bottom 25% of GCSEs	25% MSE	Chemistry Promotional Exam Mark	Correlation Coefficient	.593*
			Significance (1 tailed)	.016
			N	13
		Pure Mathematics & Statistics Promotional Exam Mark	Correlation Coefficient	.615
			Significance (1 tailed)	.053
			N	8
Middle 50% of GCSEs	50% MSE	Chemistry Promotional Exam Mark	Correlation Coefficient	.380*
			Significance (1 tailed)	.049
			N	20
		Pure Mathematics & Statistics Promotional Exam Mark	Correlation Coefficient	.807**
			Significance (1 tailed)	.008
			N	8
Top 25% of MSE GCSEs		Chemistry Promotional Exam Mark	Correlation Coefficient	.652*
			Significance (1 tailed)	.015
			N	11
		Pure Mathematics & Statistics Promotional Exam Mark	Correlation Coefficient	.898**
			Significance (1 tailed)	.003
			N	7

* Correlation is significant at the .05 level

** Correlation is significant at the .01 level

Table I: Spearman's Rho Correlations between Students Promotional Examination Results and Attendance at Peer Support for first year students split by Mathematics, Science and English GCSE Quartiles