STUDENT AND STAFF PERCEPTIONS OF A SCIENCE PROGRAM FOR POOR READERS

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ABSTRACT

This study was concerned with the student and staff perceptions of an implemented science program developed for poor readers in normal Year 8 classes at one school. Student and staff perceptions were obtained from analyses of responses to learning environment perceptual measures and interview questions. Not only did the participants respond positively to the program, but also the poor readers perceived their learning environment more favourably than the good readers in the same classrooms.

INTRODUCTION

Students with little or no competence in reading find it difficult to make progress in science (Sands, 1979). Since teachers are concerned with the academic, social and personal development of their students, it's not surprising that a number of attempts have been made to assist poor readers in science classes. Documented examples of such attempts include: a "talking book" approach, where audio-tapes of an ASEP unit were used to supplement the written word (Beeson & Fletcher, 1979); a set of supplementary science exercises for second language junior science students (O'Toole, 1985); and a program which involved the use of a combination of approaches (viz. concrete activities, mastery learning, audio-tapes and tutorial assistance) with poor readers in Year 8 science classes (Ritchie, 1985). The last of these is the subject of discussion in this paper. More specifically, this paper focuses on the student and staff perceptions of an implemented science program developed for poor readers in normal Year 8 science classes at one school. Before discussing the purpose, method and results of the study, the program is briefly described.
PROGRAM DESCRIPTION

Although the program has been previously detailed (Ritchie, 1985), the number of improvements made to the program as a result of small-scale evaluations undertaken since, warrant an updated description. Therefore, the program is described as it was implemented in its last year of operation.

Up to eight poor readers from each class were placed in groups (pairs) by their teacher. Each group worked as a separate unit through a set of modules written by Stuart Traynor (1980). These (mastery learning) modules were written specifically for poor readers of less than average ability and required students to undertake a variety of concrete activities. Audio-tapes of these modules were provided and adult tutors (teacher aides) were allocated to each lesson to assist the poor readers.

The teacher initiated each lesson for the good readers whilst the poor readers worked independently (from the class) — obtaining assistance from each other, the tutor and the teacher (less frequently). Although the teacher often introduced concepts in class by selecting a few activities from Traynor’s (1980) modules, the good readers participated in a different set of learning experiences than the poor readers. However, the program for poor readers was designed such that there was some degree of compatibility between the concepts covered by the poor readers and those which were exposed to the good readers in class.

PURPOSE

The following questions provided a focus for this investigation:
1. What is the learning environment like for the poor readers?
2. How do the learning environment perceptions of poor readers and good readers compare?

METHOD

The investigation was conducted in two phases, spanning a two-year period. Each phase of the study was completed in a separate year.

Sample

All 21 poor readers from four Year 8 classes and their staff (tutors and teachers) were involved in phase-one of the study, whilst 16 poor readers from three classes and their staff were involved in phase-two of the study. In addition, 50 good readers were involved in phase-two of the study.

Design

Student and staff perceptions of the program were obtained from interviews and analyses of responses to learning environment perceptual measures. However, the procedures used in each phase were different.

Phase-one. The My Class Inventory (Fraser et al., 1982) was well suited to students with reading difficulties since it was primarily developed for use in upper primary classrooms. This instrument consists of 38 items, with each designed to fit one of five scales (six for Cohesiveness, eight for Friction, eight for Difficulty, nine for Satisfaction and seven for Competitiveness).

Typical items contained in the My Class Inventory (MCI) are: "Children are always fighting with each other" (Friction) and "Children seem to like the class" (Satisfaction).

The MCI administered in this study differed from the original form in that the two-point response format (Yes-No) was replaced by a four-point response format (Strongly Disagree, Disagree, Agree, Strongly Agree) for the benefit of staff who completed the MCI. Scores of 4, 3, 2 and 1 were allocated to the responses of SA, A, D and SD, respectively, except for reversed items where the scores were similarly reversed. Neutral responses (errors or incomplete items) were given a score of 2.5.

The MCI was administered individually before or after each participant’s interview. During the interviews, students and staff were asked about their work, what they thought of it and how it compared with their previous experience, and were requested to comment on the use and value of the innovation.
Phase-two. Like phase-one of the study, all program participants completed MCI instruments and were interviewed.

The learning environment dimensions assessed in phase-one of the study, however, neglected the System Maintenance and System Change Dimensions Category, considered one of the three essential categories for psychosocial environment assessment (Moos, 1974). Similarly, there were some aspects of science classroom environments (e.g. participation in a number of varied investigations) not assessed by the MCI. To address these design weaknesses in the second phase of the study, the Individualised Classroom Environment Questionnaire (Fraser, 1986a) was administered to all participants and good readers (who were not directly involved in the program).

The Individualised Classroom Environment Questionnaire (ICEQ) differs from other classroom environment instruments in that it assesses those dimensions (e.g. Participation, Investigation) which distinguish individualised classrooms from conventional ones. The ICEQ contains 50 items altogether, with an equal number of items belonging to each of the five scales (viz. Personalisation, Participation, Investigation, Independence and Differentiation). Each item is responded to on a five-point scale with the alternatives of Very Often, Often, Sometimes, Seldom and Almost Never. Typical items are: "The teacher considers students' feelings" (Personalisation) and "Different students use different books, equipment and materials" (Differentiation).

Data Analyses

The validity and reliability of the MCI and ICEQ instruments have been demonstrated in a variety of classrooms throughout the world (e.g. Fraser, 1986b). These instruments were also found to be reliable measures for assessing the learning environment in the Year 8 classes in which the program was implemented. For example, the calculated Cronbach alpha reliability coefficients for some of the scales were: Cohesiveness = 0.80, Friction = 0.83, Satisfaction = 0.81, Personalisation = 0.68 and Investigation = 0.70.

TABLE 1

ANOVA results for differences between the perceptions of the classroom learning environment held by poor readers and good readers on nine scales from the MCI and ICEQ

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean for Poor Readers (N = 16)</th>
<th>Mean for Good Readers (N = 50)</th>
<th>F*</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohesiveness</td>
<td>16.50</td>
<td>14.25</td>
<td>5.91</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Friction</td>
<td>18.50</td>
<td>21.31</td>
<td>5.56</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Difficulty</td>
<td>18.25</td>
<td>16.33</td>
<td>4.19</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>26.06</td>
<td>23.84</td>
<td>3.95</td>
<td></td>
</tr>
<tr>
<td>Competitiveness</td>
<td>17.8</td>
<td>20.00</td>
<td>7.04</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Personalisation</td>
<td>34.88</td>
<td>32.94</td>
<td>1.51</td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>31.94</td>
<td>33.04</td>
<td>2.66</td>
<td></td>
</tr>
<tr>
<td>Investigation</td>
<td>32.06</td>
<td>33.92</td>
<td>1.67</td>
<td></td>
</tr>
<tr>
<td>Differentiation</td>
<td>28.81</td>
<td>24.33</td>
<td>10.15</td>
<td>p &lt; 0.01</td>
</tr>
</tbody>
</table>

* Degrees of freedom for numerator = 1
Degrees of freedom for denominator = 65

Whilst much of the data in this study were qualitative in nature (i.e. the interview data), analysis of variance (ANOVA) was used to investigate differences in the means obtained by the group of poor readers and the group of good readers for perceptions of the learning environment.

RESULTS AND DISCUSSION

Table 1 shows the results obtained from the ANOVA for differences between the perceptions of the classroom learning environment held by good readers and poor readers on nine scales from the MCI and ICEQ instruments. Only the ICEQ scale of Independence was not considered because the poor readers did not work by themselves but rather in pairs, and therefore, it seemed an inappropriate scale. The poor readers perceived their environment to be characterised by significantly higher levels of cohesiveness ($F = 5.91, p < 0.05$), difficulty ($F = 4.19, p < 0.05$) and differentiation ($F = 10.15, p < 0.01$) and lower levels of competitiveness ($F = 7.04, p < 0.01$) and friction ($F = 5.56, p < 0.05$). Whilst the poor readers expressed higher levels of satisfaction and personalisation than did good readers, these differences were not statistically significant at the five percent level. Therefore, with the exception of the scale of Difficulty, the poor readers generally perceived their environment more favourably than good readers who worked in the same classrooms.

The comments made by students and staff during their interviews reinforces the results shown in Table 1. In fact the participants identified a number of positive aspects of the program.

First, the program provided poor readers with enjoyable learning experiences which, in turn, enabled the students to experience success and satisfaction. Although the difference between the poor readers' and good readers' perceptions of the classroom environment for the scale of Satisfaction was not statistically significant (Sat = 26.06 & 23.84), it was strengthened by the comments made by the program participants. One teacher, for example, suggested that:

"I think that they are enjoying what they're doing... Their interest is aroused because they got something out of it..."

The most enjoyable aspect of the program for the poor readers was undertaking experimental activities. They also enjoyed listening to the audio-tapes and suggested that these helped them to follow the text (e.g. the instructions) of the modules.

Second, not only did the poor readers benefit from the implementation of the program, but also the teachers were rewarded personally and professionally from their participation in the program. One teacher said:

"Well I have never been involved in this sort of program before and it is interesting to see how it has worked from a structural point of view... I've enjoyed having an assistant in the classroom as well."

Other staff members (e.g. the tutors) reported that they had enjoyed working closely with students and that their work with poor readers in class had improved their interpersonal relationships with some students.

Third, just as Beeson and Fletcher (1979) reported a reduction in discipline problems with the implementation of their "talking book" approach, so too did the teachers in this study. A young female teacher, for example, suggested that since the program was implemented in her classroom, fewer discipline problems presented, and as a consequence, more teaching time was available.

Other positive aspects of the program identified by the program participants included the variety of activities undertaken by the students (c.f. Differentiation scale in Table 1), cooperative learning in work-pairs and associated student discussions (c.f. Competitiveness scale in Table 1).

Not all comments about the program, however, were favourable. Concern was expressed about the following issues: lack of expertise and confidence of tutors, progression by poor readers...
to the normal science program in Year 8 and subsequent years and the practical difficulties of student absenteeism (e.g. when one member of the group was absent the other member was expected to continue work independently, only to find the need to review the work upon the return of the partner). The implementation of practical solutions to these problems continues to challenge the staff of the study school.

CONCLUSIONS

This study revealed that the program for poor readers described in this paper was favourably perceived by the student and staff participants. Other questions need to be addressed before the impact of the program can be fully assessed. For example; questions relating to the efficacy of the program over a period of time (e.g. six months), would be worthy of consideration.

REFERENCES


