

Students with learning difficulties: Skill development through the music program

Patricia L. Bygrave

Abstract

Case studies involving eight students with learning difficulties aged 7-9 years were undertaken in four special education settings. Teachers predicted that four of these students would improve their listening skills through participation in a specific program and four students would not. At the end of a 30-week intervention period the students who participated in a music program, including those predicted as not likely to improve, showed improvement in listening skills and in academic, cognitive and social skills. The development of these skills also had a positive impact on the student's self-concept. Such findings suggest that skills learnt through a music program transfer to other areas of learning.

Introduction

What happens to students with learning difficulties when they are involved in a specific program to develop their listening skills? Obviously, an expected outcome would be an improvement in the student's listening skills. It also could be anticipated that different aspects of a program might lead to the development of other skills related to learning. These could be skills associated with the academic areas of schooling, with cognitive processing and with social interaction. This paper sets out to describe the effects of two programs, a music program and a story-telling program, on the development of skills in eight students from four special education settings.

A common characteristic of children with learning difficulties is their slowness to learn. These children experience problems achieving academically (Ashman & Elkins, 1990), and exhibit delays for their age-group in skills associated with general development and abilities (Court, Grant, Long, Oberklaid, & Sykes, 1990). While learning difficulties for students are known to occur in numeracy, the area in which the majority of students encounter academic problems is in that of literacy (Ashman & Elkins, 1990; Berry & Kirk, 1980). The acquisition of skills associated with reading (Bryant & Bradley, 1985), oral language and listening, has been long recognised as problematic in literacy (Sonnenschein, 1982; Whitehurst & Sonnenschein, 1981).

Studies related to skills associated with cognitive processing have demonstrated that children with learning difficulties have problems not only with skills of listening (Alley & Deschler (1979) but also with those of attention (Tarver & Hallahan, 1974), comprehension (Kotsonis & Patterson, 1980), memory (Bauer, 1977), and problem solving (Spekman, 1981). A lack of these skills may impact on their behaviour, particularly off-task behaviour. A study of relationships between children with learning difficulties and their peers has indicated that teachers attribute more negative characteristics to students with learning difficulties, and that parents and peers are more likely to have negative attitudes towards these children particularly in relation to their off-task behaviour (Bryan, Donahue & Pearl, 1981).

Cognitive processes have been linked to social cognition and to interactions between people (Flavell, 1985). There are many studies with children showing that cognitive processes such as memory and comprehension (Paris & Lindauer, 1982) and related tasks (Doise, 1985) develop through social interaction and playgroups (Sylva, Roy & Painter, 1980). The effects of co-operative learning on low-achieving primary school children also have been examined (Yager, Johnson & Johnson, 1985). The study found that there was a transfer of learning skills from the group to the individual when low-achieving students

worked in co-operative learning groups for listening activities structured around oral interaction.

Music has been associated with the teaching of concepts of language (Kalmar, 1989; McMahon, 1982) and elements of language such as receptive vocabulary skills (Bygrave, 1995/96). The role of music in developing cognitive activity has been discussed (Bygrave, 1991a) together with its function in developing cognitive processing skills in students with learning difficulties (Bygrave, 1996). Music education has been reported as developing and improving children's academic abilities in ordinary schools (Bridges, 1984) and in special education settings (Dobbs, 1966). A historical review of text book literature examining the reasons for teaching music to children found a number of relationships between music and children's physical, cognitive and language development (Draper & Gayle, 1987). The possibility of a relationship between music and the development of social and group skills in children also was raised in the review.

In a recent study, the effects of a music program on the development of listening skills in students with learning difficulties was examined (Bygrave, 1991b). Data supporting the development of these skills have been presented (Bygrave, 1991b, 1994). What occurred however, in a microcosm of four special education settings with regard to a music program I will present in this paper. The data to be reported are based on eight case studies. Two students in each special education setting were identified by their class teacher; one whose listening skills was expected to improve from participation in a listening skills program and one whose listening skills was not expected to improve.

Description of the study

A total of twenty-nine students with learning difficulties, aged from 7-9 years, participated in a research study over a 30-week intervention period (Bygrave, 1991b, 1994). The students were in four special education settings attached to ordinary primary schools in the Australian Capital Territory (ACT). Although the schools were in different locations throughout the ACT, records indicated that the students were of white European descent with similar backgrounds and IQ score (range 58-103).

The study focussed on the development of the listening skills of the students through their participation in two programs. One, a music program (Leask & Thomas, 1986) implemented by the class teacher, centred around listening activities associated with the music topics of singing, playing musical instruments, creating and movement. The other, a story-telling program (Field & Walsh, 1989) involved the students listening and responding to questions about stories read by the class teacher. The programs were randomly assigned to the special education settings with one class undertaking the music program, another the story-telling program, the third both the music and story-telling programs; the fourth class acted as a control. Each special education setting was accorded the same treatment and the programs were implemented daily. While all of the students participated in integration activities with ordinary classes at their schools, they had experienced little music prior to the study. None of the four teachers involved in the study had a musical background.

Prior to the intervention period, all students in the study were tested (pretests) using a battery of seven tests assembled to measure the effects before and after participation in the music program and the story-telling program. For a more substantial discussion of the tests please refer to Bygrave (1991b, 1994). These tests, administered by two independent testers, measured different aspects of listening such as receptive vocabulary, listening comprehension, and phonological processing; one test, a mathematical test, was used as a control. The tests were again administered at the end of the intervention period (posttests) and 7 weeks later (postposttests). None of the teachers had access to any student's pretest and subsequent test scores throughout the intervention period.

Other data sources included: confidential forms, teacher-diaries, teacher-interviews, classroom observations, student-interviews, and school reports. These provided information about each student regarding academic, cognitive, behaviour, communication, motor-skills, social and home background. All of the student's caregivers were informed about the study and offered no objections.

Six male and two female students were identified by the class teachers for case studies by Week 4 of the intervention period. The male to female ratio (21 males to 12 females at the beginning of the intervention period) contributed to the higher proportion of males. Two males and two females (average age 7.8 years) were identified as likely to improve; four males (average age 7.2 years) as not likely to improve. Classes used for the integration of these students encompassed Kindergarten to Grades 2/3. The IQ mean range of those students predicted as likely to improve was 58-103; of those not likely to improve 69.5-103. It appeared from the pretest scores that the eight case study students were not the highest or lowest achievers in their class. For the purposes of confidentiality each case study student was assigned a code. A letter designated the setting and program - A=music, B=story-telling, C=music and story-telling, D=control. The number 1 categorised those students as likely to improve; the number 2 as those students unlikely to improve.

Case studies

Three of the eight students (C1, A2, C2) had been in their special class since the start to the school year. The other students had been in their class for varied time periods (range 2 years to 1 year). Apart from two students (C2, D2), all came from two-parent families. While each of the eight students had delayed development in mathematics, most of their academic problems were associated with literacy. Each student's report recorded delayed comprehension skills and in one student (C1) this was linked to listening. Other problem areas included reading accuracy, auditory skills, composition and spelling. Two students (A1, B2) had difficulties with attention skills, one student (D1) with speech, and two students (D1, C2) wore spectacles. All students apart from one (D2) had motor-skill problems.

All of the category-1 students were mostly on-task in work habits while three of the category-2 students (A, C, D) exhibited off-task behaviour. One of these students (A2), had a severe behaviour problem and was on a behaviour modification program, special diet and drugs. The behaviour of the students also appeared linked to their social skills. Apart from one student (C1) who was gradually being accepted, those students with on-task behaviour were liked and accepted by their peers within and without the classroom. The other students were anti-social, did not participate in activities and showed inappropriate social skills such as aggression.

Results and discussion

Music and music and story-telling programs

Data from the pretests, posttests and postposttests indicated that the two students participating in the music program and the two students in both the music and story-telling programs, showed overall improvement in skills associated with listening comprehension, phonological processing and receptive vocabulary (Bygrave, 1991b). Clearly, these data provide evidence that the students developed certain skills that can be associated with literacy. Specific skills linked to cognitive processing such as listening and comprehension, also were measured and shown to develop in these students. No significant connection was found between the language-related tests and the mathematical test.

Reports from the teachers, panels, interviews and observations, testified to the development of each student's motor-skills, behaviour in and out of the classroom, and social interactions. The social skills of the two students in category-1 further improved.

The student in the music program (A1) developed sufficient attention skills, confidence and leadership qualities to be recommended for mainstreaming the following year and the confidence of the student (C1) in the music and story-telling program was "zooming" (Teacher C). The behaviour of the two students in category-2 also was reported to have improved. They were participating and demonstrating self-discipline and confidence in music and story-telling activities and experiencing positive peer interactions. This had impacted on their work habits and the teachers noted that as their academic skills improved so too did their self-concept. One teacher (A) reported the behaviour modification program undertaken by one student (A2) as "helpful". Both teachers however, commented on their "inadequate" identification of the two students selected as not likely to improve through their participation in a listening program. These were made on the basis of family history, IQ, learning difficulties, behaviour and social skills.

Story-telling and control programs

Data from the pre to posttests indicated that the listening comprehension skills of all four students in the story-telling and control groups improved slightly (Bygrave, 1991b). The phonological processing skills of one student (B1) improved markedly from the pre to postposttests and in the other (D1) slightly, as did her receptive vocabulary skills. Both students in category-2 showed some improvement in these skills between the pre and posttests but this had decreased by the time of the postposttests. Various factors may have influenced these postposttest results. Firstly, one teacher (D) commented that my weekly interviews from the pre to posttests, which were then discontinued, had helped maintain the continuity of a listening program being undertaken in that class. I had been unaware until the first interview in Week 1 of the intervention period that this teacher was daily using a tape-recorded listening program. Secondly, the teacher of the story-telling program reported that her student (B2) had exhibited poor memory and attention skills during the post-postposttest period possibly due to family disruptions.

The on-task behaviour and social interactions of the students remained the same over the intervention period apart from one student (D2) who improved after the departure of a close friend from the class. The motor-skills of the students remained the same except for one student (B1) who improved. This student later was reported as developing generally over the school year.

Aspects of the programs

Two aspects of the programs became apparent during the study, one concerning activities and the other social interactions. In relation to activities, the music program emphasised active activities such as playing instruments, singing and movement. By contrast, the activities of the story-telling program were more passive involving sitting, listening and answering questions. This had bearing on the students' responses to the programs. While the students in the music program were enthusiastic about various music activities involving "action" during interviews, the students in the story-telling program said they liked the stories but did not elaborate why. There were differing responses from the two students in the music and story-telling programs with one (C1) not liking the stories "because of no pictures" and the other (C2) only liking those stories with associated activities.

The social interaction of the students in the music program was noticeable. These students experienced new opportunities through music activities to learn in groups or with partners. The positive effects of such interactions became evident almost immediately. One teacher (C) for example, was "taken by surprise" when the class, who previously had not participated in a school assembly, initiated an impromptu musical performance at the school assembly in Week 2 of the intervention period. The evidence presented in this study therefore would suggest that a positive relationship does exist between musical activities and the development of social and group skills (Draper & Gayle, 1987). It also substantiates the transfer of learning skills such as listening and understanding, through

co-operative learning groups (Yager, Johnson & Johnson, 1985). The development of such skills was evident in all of the students during the intervention period, particularly in the category-2 students (A2, C2), who went from non-participants to active learners.

Conclusion

The data presented in this paper clearly indicate that the students in the music program developed skills to assist them in literacy, cognitive processing and social interactions. It would appear that the development of these also transferred to effective listening and understanding skills. The self-concept of the students also was affected with one student developing leadership skills and the others gaining in confidence. While an objective of the study was to delineate the elements common to the individual students, and link these to a music program to illustrate the development of skills, the study also provided another important insight into learning. A major observation was that while the students mainly indicated that they were interested in both programs, there was an enthusiasm and active on-task behaviour seen and reported in the students during the music sessions that was not apparent in the story-telling lessons. Questions arise as to whether it was this enthusiasm that affected the students' learning or other variables such as natural development. If the later was so, it could be argued that the development was consistent across all of the music case studies. As to whether other programs could have a similar impact on developing skills in students with learning difficulties, remains a challenge for the future.

About the author

P. L. Bygrave, TC (Distinction)(NZ), BEd, MEd (CCAEB), PhD (Macq), ATCL (London), MIMT; Visiting Scholar, Faculty of Education, University of Canberra; Research: Cognitive skill development through music; children with learning difficulties; transfer of domain-specific knowledge in children's learning eg. music literacy skills.

References

- Alley, G. , & Deschler, D. (1979). *Teaching the learning disabled adolescent: Strategies and methods*. Denver, CO: Love.
- Ashman, A. , & Elkins, J. (1990). *Educating children with special needs*. Sydney: Prentice Hall.
- Bauer, R. H. (1977). Memory processes in children with learning disabilities: Evidence for deficient rehearsal. *Journal of Experimental Child Psychology*, 24, 415-430.
- Berry, P. , & Kirk, S. A. (1980). Issues in specific learning disabilities: Towards a data base for decision-making. *The Exceptional Child*, 27, 115-125.
- Bridges, D. (1984). Eclecticism in early music education. *International Journal of Music Education*, 3, 35-37.
- Bryan, T. , Donahue, M. , & Pearl, R. (1981). Learning disabled children's peer interactions during a small-group problem-solving task. *Learning Disability Quarterly*, 4, 13-22.
- Bryant, P. , & Bradley, L. (1985). *Children's reading problems*. Oxford, UK: Blackwell.
- Bygrave, P. L. (1991a). Music: A cognitive developing activity. *Australian Journal of Music Education*, 2, 22-29.
- Bygrave, P. L. (1991b). *Music and the development of listening skills in children with learning difficulties*. Unpublished PhD thesis, Macquarie University, Sydney.
- Bygrave, P. L. (1994). Development of listening skills in students in special education settings. *International Journal of Disability, Development and Education*, 41(1), 51-60.
- Bygrave, P. L. (1995/96). Development of receptive vocabulary skills through exposure to music. *Bulletin of the Council for Research in Music Education* (Special issue), 127, 28-34.

- Bygrave, P. L. (1996). Activity in a music program and the development of cognitive processing skills. *Proceedings of the XVIII Annual Conference of the Australian Association for Research in Music Education*, Sydney, 33-38.
- Court, J. M. , Grant, A. , Long, P. , Oberklaid, F. , & Sykes, S. (1990). *Learning difficulties in children and adolescents*. Report of the National Health and Research Council. Commonwealth of Australia: Health Care Committee.
- Dobbs, J. P. B. (1966). *The slow learner and music*. London: Oxford University Press.
- Doise, W. (1985). On the social development of the intellect. In V. L. Shulman, L. C. R. Restaino-Baumann & L. Butler (Eds.), *The future of Piagetian theory: The Piagetians* (pp. 99-121). New York: Plenum Press.
- Draper, T. W. , & Gayle, C. (1987). An analysis of historical reasons for teaching music to young children: Is it the same old song? In J. C. Peery, I. W. Peery & T. W. Draper (Eds.), *Music and child development* (pp. 194-205). New York: Springer-Verlag.
- Field, H. , & Walsh, J. (1989). *Learning to listen and remember*. Sydney: Macquarie University Special Education Centre.
- Flavell, J. H. (1985). *Cognitive development* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Kalmar, M. (1989). The acquisition of some attribute concepts and the effects of music education in 3-6 year old children. *Canadian Music Educator, Research Edition*, 30(2), 51-59.
- Kotsonis, M. E. , & Patterson, C. J. (1980). Comprehensive-monitoring skills in learning disabled children. *Developmental Psychology*, 16(6), 541-542.
- Leask, J. , & Thomas, L. (1986). *Upbeat*. South Yarra, Melbourne: Bojangles Music.
- McMahon, O. (1982). A comparison of language development and verbalisation in response to auditory stimuli in pre-school age children (Special issue). *Psychology of Music*, 82-85.
- Paris, S. G. , & Lindauer, B. K. (1982). The development of cognitive skills during childhood. In B. B. Wolman (Ed.), *Handbook of developmental psychology* (pp. 333-349). Englewood Cliffs, NJ: Prentice-Hall.
- Sonnenschein, S. (1982). The effects of redundant communications on listeners: When more is less. *Child Development*, 53, 717-729.
- Spekman, N. J. (1981). Dyadic verbal communication abilities of learning disabled and normally achieving fourth-and fifth-grade boys. *Learning Disabilities Quarterly*, 4, 139-151.
- Sylva, K. , Roy, C. , & Painter, M. (1980). *Childwatching at playgroup and nursery school*. London: Grant McIntyre.
- Tarver, S. G. , & Hallahan, D. P. (1974). Attention deficits in children with learning disabilities. *Journal of Learning Disabilities*, 7(9), 560-569.
- Whitehurst, G. J. , & Sonnenschein, S. (1981). The development of informative messages in referential communication : Knowing when versus knowing how. In W. P. Dickson (Ed.), *Children's oral communication skills* (pp. 127-141). New York: Academic Press.
- Yager, S. , Johnson, D. W. , & Johnson, R. T. (1985). Oral discussion, group-to-individual transfer, and achievement in cooperative learning groups. *Journal of Educational Psychology*, 77(1), 60-66.