Education and Training in Autism and Developmental Disabilities, 2011, 46(2), 276–290

Use of Multisensory Environments in Schools for Students with Severe Disabilities: Perceptions from Schools

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Abstract: Multisensory environments (MSEs) have become popular in schools for students with severe disabilities in the UK, the US, and Australia, despite a lack of convincing research evidence for any positive effects on learning and behaviour. This paper reports on in depth interviews with staff from two schools in Sydney, NSW, Australia that explored the background to the installations of MSEs, perceptions, and beliefs about the effects of use of MSEs. School staff was unfamiliar with the literature on MSEs and relied on the Internet and commercial firms for information. They accepted the claims made for the effects of MSEs, but translated these claims in the light of their beliefs about the needs of their student population. Calls are made for education departments to provide more information and support to schools when they make decisions about the use of resources and to support schools in making objective evaluations of the outcomes of use of MSEs.

Multisensory environments (MSEs) are rooms or spaces containing equipment that is designed to provide sensory stimulation to the users. Ideally, the sensory experiences provided are tailored to the perceived needs of the user (Fowler, 2008). The equipment typically includes items such as projectors and effect wheels, bubble tubes, music equipment, fibre optics, vibrating devices, aroma diffusers and sound equipment (Fowler; Lancioni, Cuvo, & O'Reilly, 2002). MSEs originated in Holland in the 1970s and were originally intended to provide a leisure option for persons with severe and profound disabilities. Hulsegge and Verheul (1987) gave them the name snoezelen, but this term is now a registered brand name belonging to the Rompa company and MSE is the preferred term (Botts, Hershfeldt, & Christensen-Sandfort, 2009). In the original concept of snoezelen, participants were free to explore and enjoy the experiences provided, and there were no predetermined aims or objectives, and certainly no educational or therapeutic outcomes were intended (Botts et al.; Bozic, 1997; Hogg, Cavet, Lambe, & Smeddle, 2001; Hulsegge & Verheul).

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The use of MSEs spread from adult services for people with severe and multiple disabilities to other populations and other settings, and they have become popular in special schools serving students with disabilities in several countries including Australia (Botts et al., 2009; Bozic, 1997; Houghton et al., 1998; Pagliano, 1999; Stephenson, 2004). When MSEs moved into schools, there was a move away from seeing MSEs as simply providing a passive leisure experience (Fowler, 2008; Hirstwood & Smith, 1996) and they were promoted as an environment for assessment and teaching. These two aims are obviously not mutually exclusive, but in schools it might be expected that the focus would be on use of the rooms for learning and teaching.

In the UK and other places the use of MSEs in schools has been linked to sensory curricula (Fowler, 2008; Gallaher & Balson, 1994; Hogg et al., 2001). This seems to stem from a belief that children with severe and multiple disabilities need sensory experiences in order to develop cognitive and social skills (Gallaher & Balson). The teacher's role is to plan and control the use of the MSE to provide passive stimulation and opportunity for the child to relax and explore, as per the original snoezelen philosophy. The actual outcomes of

this stimulation remain vague but have included such things as an increase in attention span, improved sensory and motor development, communication skills and improved quality of life (Pagliano, 1999). The MSE also provides a context for teaching a range of skills that could also be taught in other environments such as communication skills and switch use. Claims were also made for the calming of children exhibiting challenging behaviour and for reduction in stereotypic behaviour (Gallaher & Balson).

There has been limited research on the effects of MSEs and snoezelen and particularly in relation to the effects on children. Reviews of research on MSEs (Hogg et al., 2001; Lai, 2003; Lancioni et al., 2002) identified only five studies reporting the effects on children with disabilities who received intervention in small groups, as typically happens in schools (de Bunsen, 1994; Houghton et al., 1998; Shapiro, Parush, Green, & Roth, 1997; Meijs-Roos, 1990; Sin & Kwok, 1999). Although there is some evidence that behaviour of children may change while they are actually in an MSE this evidence is "rather preliminary and circumscribed" (Lancioni et al., p. 180). There appears to be little evidence that changes in behaviour observed in MSEs carry over to other environments (Hogg et al., Lancioni et al.), which is a critical outcome if MSEs are to make an educationally significant contribution. All three review papers commented on the generally poor research designs and inconsistent results.

More recently, Botts et al. (2008) carried out a more rigorous review of the effects of snoezelen using stringent criteria for the quality of the studies derived from the requirements of the No Child Left Behind Act of 2001. They had intended to review research carried out in school settings, but found no relevant quality studies and so broadened their focus to studies undertaken in other environments. They found five studies overall that met their criteria and only two of these (Chan, Fung, Tong, & Thompson, 2005; Shapiro et al., 1997) included children. Chan et al. included only seven participants aged below 20 years, and all participants were living in an institution. Chan found that although participants in the snoezelen group increased their positive emotions in comparison to an activity group, there were no differences between the groups on measures of aggression, self-stimulatory behaviour or adaptive behaviour. Shapiro et al. included 20 participants, again living in an institution. They compared child behaviour in snoezelen with behaviour in a playroom and found more adaptive behaviour in the snoezelen. Botts et al. considered that Shapiro et al. may have overstated their findings when claiming the snoezelen was effective for reducing self-stimulatory behaviour. They noted that neither study demonstrated generalisation to settings outside the snoezelen environment. The Shapiro et al. data may indicate that snoezelen had a regulatory effect on heart rate, however this effect was not found in the Chan et al. study. Botts et al. concluded that "the Snoezelen® environment is an unproven intervention" (p. 145).

These findings from the research contrast starkly with the claims of positive effects made by proponents of MSEs. In light of the apparent widespread adoption of MSEs, it was of interest to consider how and why an approach that originally eschewed any educational or therapeutic outcome, and which has little credible evidence to support its effectiveness in bringing about educational outcomes, has been adopted by schools educating students with severe disabilities. As a first step in elucidating an answer to this question, a qualitative study was completed where we conducted interviews with volunteers from two special schools that had installed MSEs to discover: (1) how and when they learned about MSEs; (2) what factors influenced their decision to install an MSE; (3) how they obtained funding for their MSEs; (4) what were their beliefs about the effects of MSEs; (5) what was their rationale for installing an MSE; and (6) how they used MSEs within their schools.

Method

Three NSW Department of Education and Training (NSW DET) schools enrolling students with severe disabilities that were located within the Sydney, NSW metropolitan area and that were known to have installed an MSE were contacted about their willingness to participate in the study. The first two schools to

agree to participate were used in the study. Schools were asked to provide volunteers who were knowledgeable about the history and use of the MSE within their school to be interviewed. At School 1 the two interviewees were a member of the school executive and a teacher who was involved in setting up the MSE in the school but who was no longer working there. At School 2 there were two current staff, a member of the executive and a teacher.

The interviews were conducted by a research assistant who used a set of interview questions, but who also probed for additional information when she thought it was appropriate. The interviewer transcribed each interview and provided copies to all interviewees for their correction. No changes to the transcriptions were made by the interviewees.

The interview included both open ended questions to elicit the history of, and rationale for installing an MSE, how the school found out about MSEs, whether or not the school read any research about MSEs, overall use of the MSE, whether and how the MSE was used for leisure, for assessment and/or teaching, what specific equipment was installed and the perceived benefits of both the MSE and specific pieces of equipment. Further specific questions about particular purported outcomes drawn from a survey of websites promoting the use of MSEs, (Stephenson, 2002) were included and covered benefits of sensory stimulation, use for relaxation, motivation effects, use to calm agitation and improve behaviour, improved attention to task after use, use to build positive relationships and trust, use for the development of control and autonomy, and the development of cognitive skills. The interviewer was free to determine the order of questions, but was asked to ensure all questions were addressed. A copy of the interview questions is presented in Table 1.

The transcribed interviews were analysed and coded using TAMS analyser (Weinstein, 2008). The first coding was carried out by the first author, and then reviewed by the second. Data were coded for themes and factual information related to the research questions. The results are reported in relation to the identified themes.

Results

History and Funding at School 1

School 1 has had some form of MSE since the early to mid–90s. After some initial exploration of sensory activities with students, mainly aromatherapy and massage, the school set up one classroom as a dark MSE. Basic equipment purchased from school funds was installed, including a projector, fan, fluorescent items and a bed with a sound system. Additional equipment such as foot spas, a bubble tube, computer and fibre optics were added later. Staff tried to select equipment that they saw as having multiple functions, rather than equipment dedicated to a single use. The room now has a range of equipment designed to provide visual, tactile, olfactory and auditory stimulation. As the school enrolls many students with physical disabilities, the rooms were equipped with tables high enough to be used by students in wheelchairs.

The MSE is currently used by all students at the school, and the school has only had one student for whom the room was seen as unsuitable because he was very active and destructive. It is also used by outside groups of adults with severe disabilities. It has been visited by other schools seeking information about MSEs. The school has been the location for workshops, attended by school staff, run by commercial firms including Wilkins International/SpaceKraft.

After the installation of the initial dark room, the school was classified as being eligible for extra funding for literacy and numeracy programs under the Disadvantaged Schools Program (DSP) of the NSW DET. It was successful in obtaining a grant for further development of the MSE. The MSE was moved to another room in the school that allowed for both a dark room and a white room. These rooms were set up for the school by a commercial company, Wilkins International who are agents for SpaceKraft, a UK supplier of equipment for MSEs. Wilkins International then used the room as a demonstration for other potential customers. In addition to government funding, the school obtained a grant from the Variety Club that was used to purchase additional equipment. Interviewees es-

TABLE 1

Questions for Interviews about History and Rationale

Interview Questions
How did your school first find out about multisensory environments (MSEs)?
From teachers, other professionals, sales materials, WWW?
When did your school install its MSE?
Tell me how your school came to install a multisensory room.
Who first came up with the idea?
How was the school persuaded to go ahead?
How did you go about getting funding for the MSE and equipment?
Could you estimate roughly how much has been spent on MSE and its equipment?
How did you get information about what was involved?
From other people (Who?)
From sales people?
Reading (What?)
Visits to other MSEs (Where?)
Web sites?
Conferences (Which)
Have you, or others at the school read any of the research on MSEs? If so, what research?
What was your original reason for installing a MSE?
Why did you think it might be of benefit for the students at your school?
How do you understand MSEs to work?
What kinds of equipment have you installed? Projectors? Bubble tubes? Fibre optics? Sound equipment? Vibratory or tactile equipment? Switches to activate equipment? (If so, which equipment?) Other?
How many classes/students would use the MSE in a typical week?
Do people outside the school community use the MSE?
What do see you see as the benefits of the MSE in general?
What do you see as the benefits of individual pieces of equipment (equipment as previously described as being in the room)
Do you use the MSE for passive leisure activities? (That is, students use the MSE in an undirected way, adults may activate the equipment for them) If so, how?
Do you use the MSE to assess student skills or behaviour? If so, How?
Do you use the MSE to actively teach skills? (For example, do students learn to express preferences for equipment, use switches or other ways of activating equipment?) If so, some examples of skills and how taught.
How would staff at this school mostly use the MSE?
There are a range of benefits that have been claimed for MSEs. What are your thoughts on these?
Benefits of sensory stimulation?
Opportunity to relax – a break from the demands of others?
Motivator to learn (such as communication skills, motor skills, switch use)?
Calming agitation and improving challenging behaviour?
Improving attention to tasks after a session?
Opportunity to build positive relationships with staff?
Opportunity to control the environment (through switches for example)?
Opportunity to build trust?
Opportunity to explore and build cognitive skills?
Are there any other benefits you are aware of?
Have there been any problems or disadvantages in your experience with the MSE? Examples?
What supports or professional learning activities does/has the school provided around the MSEs? What issues would you/do you address in staff training?
Do you have manuals, formal policies and procedures for use of the MSE? What issues to they cover?

timated that over 15 years, approximately $100,000 had been spent on the MSE.

History and Funding at School 2

School 2 originally became interested in a sensory approach in the early 90s and set up what they called a visual-tactile room in a small spare room. As in School 1, this room had a bed incorporating a sound system. At this point they had not heard of snoezelen or MSEs and little was done until the late 90s when an itinerant support teacher (vision) and some therapists provided information about MSEs. After this, school staff used Internet sources and found the SpaceKraft site and catalogue of equipment. A committee was formed with interested teachers and, the itinerant support teacher (vision) and therapists and the visual-tactile room became an MSE. Equipment such as a projector, black light equipment, and sound/light equipment was purchased using school funds. The group continued to explore catalogues of providers and these catalogues were their main source of information: "We became the expert from the catalogues." Other Internet sites, mainly from the UK were also used, but the formal literature was not investigated. Later, a staff member completed a study tour of Europe looking at MSEs.

Expansion of the room was initially limited by budget considerations. About nine years ago, parents formed a charity group to raise money for the school and provided $13,000 for the MSE. A bubble tube, computer, fibre optics, tactile items, aroma diffusers, water features and a fibre optic carpet were added. Different kinds of switches were attached to suitable items. As well as major items from suppliers, staff bought many smaller items from bargain shops. About three to four years ago, with the arrival of executive staff interested in the MSE, it was moved from its initial location to a larger room (which had been a library) and became "a showcase for the school." Interviewees estimated that approximately $40,000 to $50,000 had been spent on the room.

At the time of the interview all students in the school except two were using the MSE on a weekly basis. Outside groups do not use the room, as it is almost always in use by the school. On occasions, two classes might use the room simultaneously.

Sources of Information and Influence for School 1

The interviewees at School 1 were uncertain about where they first learned of MSEs. They thought their initial interest was sparked by an article about snoezelen in a magazine from the UK. They believed that existing approaches to the education of students with disabilities did not suit their population of students with severe and multiple disabilities: "other tried and true philosophies about education of kids with disabilities just didn't sit well here with very severely multiply disabled children." They moved to exploring sensory approaches and expressed the belief that since children "learn through their senses" they should "enhance that." A book by Flo Longhorn (likely *A sensory curriculum for very special people*) was very influential, with copies provided to all classrooms: "It became our bible for quite a while."

School staff believed that once the MSE was established that the experiences they were providing were beneficial, and focused on finding additional resources rather than looking for any research or information about the effectiveness of MSEs: "we knew from the response of the students that this was a good way to go. There was no doubt about that, so we were looking for resources then." Their primary source of information about resources was salespeople, particularly those from Wilkins International/SpaceKraft, although they also used websites.

Another early influence was a visiting academic from the UK, who was reported to have discussed MSEs on visits sponsored by the NSW DET. Staff thought that it was this academic who suggested Wilkins International/SpaceKraft to them as suppliers of resources.

A parallel avenue that led to the MSE and a focus on sensory activities was staff experience with massage and with aromatherapy oils. Some staff attended courses on massage and aromatherapy and conceived the idea of linking different aromas with different activities and times of day. Staff also explored the use of scented oils and massage with students in classrooms. This developed to a consideration of providing students experiences that were

multisensory: "Having a literally a multisensory impact, not just smell but touch associated with the smell, sight associated with the smell and those sort of things." The perceived positive responses of students to these activities lead to further exploration of sensory approaches, as outlined above.

Sources of Information and Influence for School 2

As described in the history section, the development of the MSE at this school was driven by a small group of interested teachers and therapists (one of the original group was one of the interviewees) and then more recently by executive staff who had an interest in MSEs. This school did not build a direct relationship with a supply company, but did get most of its information from supplier catalogues and UK internet sites: "that was all based on what we had seen through the internet."

Beliefs about, Rationales for and use of MSEs

It was of particular interest to understand why schools had installed MSEs and why they thought they were appropriate in an educational setting for students with severe disabilities. Interviewee perspectives on benefits were expressed in response to both open-ended questions and to questions asking about their opinions of specific positive effects often claimed for MSEs. A number of themes emerged in the interviews, some common to both schools and some only raised by one school. The overarching themes identified will now be discussed for each school separately followed by consideration of common themes and finally, themes that were raised by only one of the schools.

Overarching Theme for School 1

Exposure to the MSE will have positive effects and sensory stimulation is beneficial. For School 1, as noted in the history, there was some dissatisfaction with what they saw as traditional educational approaches and an interest in experiential and sensory approaches developed: "the whole focus of the school is experiential and any experiential stuff has to be sensory." Within this overall orientation, an overarching theme from School 1was the generic belief and the acceptance of claims that MSEs and the associated sensory stimulation were innately beneficial, and that these experiences would result in learning: "And it was just us analysing how children learn, they learn through their senses. So perhaps we need to do something to enhance that."

In response to specific questions about how staff used the room for teaching, similar generic statements were made, with no specific descriptions provided: "it's used just to support their learning, whether that's cognitive, whether it's physical learning, whether its interacting with another person in the room, whether it's showing independence, or something that might reduce their dependence on other people. So it's . . . what is learning all about? All those areas."

In response to direct questions about the benefits of sensory stimulation, interviewees reiterated that stimulation was necessary and beneficial: "Well without it [sensory stimulation], what are you going to do? We have to be stimulated sensorially [sic] otherwise we would be a blob. Let's face it. Our students need that motivation, they need to be exposed to that, have it done almost to them, in order to respond because often they are not self-motivating without it. We need it"; "unless we keep putting in these experiences we could be losing a lot of opportunities for these kids to develop. If they don't develop we've lost nothing. . . . But there's just a chance that something might happen. So we never give in"; "The sensory experiences kids have are stored up and it does show its benefits eventually."

When interviewees were asked directly about MSEs and cognitive effects, the responses continued this theme of a general belief in positive outcomes of sensory stimulation: "And the other thing about MSEs for this level of functioning of our student cohort, there's not much else on the market that is available, that will stimulate them"; "They've got to build up their sensory skills and that's what they've got to work on. Because if those sensory skills are not active . . ."

Following this comment, the interviewees provided an explanation for the effect of MSEs in terms of the lack of appropriate experiences students with severe disabilities may have had earlier in their lives and purported deficits in their sensory development: "They

haven't had the opportunity to rumble and tumble with kids in a preschool environment and their senses just haven't been developed"; "As babies they haven't gone through all the sensory stuff that babies have gone through in a lot of cases so we need to enrich the skills involved so that they'll be able to use them in a more functional way." Perhaps this theme for School 1 is best summed up by a comment made late in the interview: "But you've got to assume that what you're doing is beneficial."

Overarching Theme for School 2

Exposure to MSE has inherently beneficial calming effects. For School 2, there was also a firm belief that exposure to an MSE was inherently beneficial: "Because we have such a high percentage of autistic children, as N said, you go from the passive to the overstimulated. I actually think it benefits the whole range of students;" "you know, you can leave or set a switch with the equipment with the child and chair and then move on and work with someone else and you know that they are benefiting from their time." For School 2, however, it was the calming and relaxing effects of the MSE, particularly for anxious or over-stimulated students that seemed most important. Although the interviewees were able to recall several of the benefits that were claimed for MSEs on the websites they visited, calming and relaxing were mentioned first and were seen as the main benefit located on websites: "that it's an environment that can stimulate and also relax. It can change according to the needs of the student. It can relax the students that are overstimulated and it can stimulate the students that are understimulated"; "the rest of the day seems to be improved because of the beneficial effects whether it is that they've been stimulated or whether it is that they've calmed down. I think that probably mainly a lot of our kids calm down, they need calming down from severe anxiety so that's why that is definitely one of the benefits"; "And I think that it would have to go up there in that top five benefits of our MSR, is our students with their anxiety disorders."

Themes Common to Both Schools

Distractibility. A theme common to both schools was the idea that the MSEs could reduce the distractibility of students. The dark room in particular was seen as valuable by both schools as it could be set up to allow students to focus on one particular item without being distracted. Interviewees from School 1 noted: "That [the dark room] is particularly good for developing cognitive skills, I think, because you can really concentrate on one specific thing. We don't have the black room set up in any particular way because we don't want them to be distracted by masses of lovely stuff that looks beautiful coming into it. But for them to be working you can just have one thing to have on, so it allows them to concentrate on that one piece of equipment." Interviewees from School 2 also described similar effects: "the black light, reduces distractions, so you've got an object before them they will become interested, whereas if they are outside with all the distractions out there you may not have any time on task."

Interviewees from School 1 described the use of other strategies, such as the use of images projected onto an umbrella physically closer to a student rather than projection on the ceiling, that was also thought to have this effect: "it can be bought much more in the child's, perhaps limited, conceptual . . . level of under . . . well not . . . visual conceptual is what I'm sort of thinking of . . . I don't know whether there is such a thing. But closer to them will cut out further distractors and they respond." School 2 provided other examples as well: "a lot of the equipment that lights up, you see that the kids really pay a lot of attention to it. Whereas outside they wouldn't in a . . . outside of that environment they may not give that time on the task or focus." Interviewees in School 2 also linked the lack of other distractions to increased engagement with activities and time on task, an elaboration not mentioned by School 1: "whereas if they are outside with all the distractions out there you may not have any time on task. Time on task seems to increase."

Transfer of skills. The transfer of skills between the MSE and the classroom was a consideration for both schools. Staff from School

1 believed that if a student demonstrated a skill in the MSE, they could work on that in the classroom: "When you see a child respond to a certain stimulus, it's a springboard for back in the classroom. . . . let's push them a bit more and see if they can do it in another situation." Skills learnt in the classroom could also transfer to the MSE, particularly the use of switches: "with the use of switches sometimes in the classroom if you use a switch it may not necessarily be as motivating further down the track as when they first started. You go over to this room, there's different motivators there, they can use the switch." Interviewees from School 2 only commented on transfer of skills in response to a direct question but made similar comments: "I guess also its good, we are all about teaching generalisation. It's good for kids to learn skills in the classroom that they can use in the sensory room as well."

Behaviour state transfer. Interviewees from both schools indicated that they thought that changes in some general behaviour states, such as improved attending or calmness carried over to other environments after use of the MSE. School 1 interviewees recounted: "some research that intensive work in the sensory room if it's on focusing and looking and being able to choose and do that sort of thing, the effect will probably last up to about 20 minutes back in the normal environment, and we have some evidence of that." When asked directly about the purported benefits of MSEs on improving attention to task, the interviewees from both schools agreed that this was the case. Interviewees from School 1 thought that this effect, for their student population, may be related to effects of the MSE on pain: "for those students who arrive and they're in a lot of pain, they're beside themselves and you try to guess how to make them comfortable. After being in the sensory room, yes, they are far more . . . it does for those students . . . you notice it!". Interviewees from School 2 also agreed there were generic benefits that carried over after use, but for them, in line with the overarching theme for this school, it was the effect of calming students rather than improved attention to task: "I think that probably mainly a lot of our kids calm down, they need calming down from severe anxiety so that is why that is definitely one of the benefits." When asked directly about improved attention to task after MSE use, interviewees from School 2 agreed that this happened, but did not elaborate.

Relaxation. One of the benefits claimed for MSEs is that use will relax the user. Both schools agreed that relaxation could be beneficial, but had differing perspectives. For the interviewees from School 1 there was the belief that students in a relaxed state might be more receptive to other learning: "It's relaxation, it's allowing kids with cerebral palsy, with the vibration of the music, the regular beat of the music that they're hearing will relax their bodies and then a lot more can happen with them." This theme was picked up again in response to direct questioning about MSEs and calming students: "they do calm down but we want them to engage. That's when they are more able to engage."

As noted above the overarching theme for School 2 was the calming effect, and interviewees were quite happy to claim relaxation as having a beneficial calming effect: "he probably accesses it two or three times a day even if it's for five minutes. Its just for him to have a bit of time out and also for him to begin to calm down, or chill out a little bit and then he'll come back and be able to settle better in class." In response to direct questions about the use of the room for relaxing students, interviewees from School 2 provided additional examples: "he would be fine just sitting there, just looking in the mirror or . . . and that would be his time out"; "for them to just sit and be relaxed and calm, even if just for 15 minutes, it's always beneficial, for them and everyone." In contrast, interviewees from School 1 only commented on the calming effect of relaxation when asked directly about use to calm student agitation. The interviewees agreed that they thought MSEs would calm agitation, but that their student population was generally not problematic.

Motivation. The interviewees of both schools saw the motivational effects of the room as a benefit. Interviewees from School 1 gave specific examples of students being motivated to reach out and touch some of the pieces of equipment: "one of the greatest ones has been the fibre optic screens, because we are getting children reaching out who don't normally reach out. We can pull the wheel-

chairs a bit further away and they have to reach further." Interviewees from School 2 noted both a general motivational effect: "it heightens their interest and attention" and the motivational effect of a piece of equipment that produced a light display in response to sound: "The students in a morning circle, you would try and encourage them, hello, get a response, an echo, anything, they wouldn't do it. But they will make a sound because they want the . . . they are totally motivated to make those lights change, the colours change."

Assessment. Both schools mentioned assessment as one of the uses of the room. Interviewees from School 1 described the use of video recording as a means of assessment: "We assess using video cameras . . . A lot of assessment will take place." The room was seen as a setting more likely to elicit behaviour than the classroom: "Particularly your, very passive child, whose movement was very, very limited and senses were very, very low, that was the room where we could do a lot of reporting and can see responses. For other children maybe not as much, but for the very low."

Interviewees at School 2 raised the issue of using the room to assess and improve visual tracking, a use not mentioned at all by interviewees from School 1, even though both MSEs provided similar kinds of equipment with moving images. School 2 raised this use early in the interview: "the moving projector could be a good assessment tool, for a teacher like N to go in and see what a certain student can see, what his vision is like, is he tracking that." In response to direct questions about assessment, interviewees from School 2 described how they had formal proformas, but these were not always used: "When the sensory room was first operating a few years ago there was lots of assessment pieces and we've sort of gone away from that a little bit"; "Because we do have the proformas and things but we sort of haven't pushed people. We wanted people to get used to going in there and using the equipment and then having a focus on assessment." In response to a question about what skills might be assessed, the interviewees from School 2 mentioned only: "it is important for some of our guys to actually do a sensory checklist, so you might think that they respond well to touch, but actually they don't."

Passive leisure. One of the traditional uses of MSEs, and the original use of snoezelen, is as a passive leisure activity (Hulsegge & Verhuel, 1987). This use was only described by the interviewees when it was raised by a direct question. In School 1 it was not seen as incompatible with other uses, and was seen as valid for occasional use and also for some particular children: "you bring children in and just move them to where they are happy, knowing the children, knowing what they like to do. Just having it as an afternoon of fun and enjoyment"; "For some of the more anxious children that's the main use for a long time, just to get them used to the room and to enjoy it and interact with things." Interviewees from School 2, when asked about the use of the MSE for passive leisure stated that use in this way was discouraged and that staff were expected to be directive in their use of the MSE: "I would hope that the teachers are directing. I think we have encouraged staff to be really hands on in the room." At the same time, the interviewee noted that the room was used in that way by some teachers, and that was problematic: "I would say people going in there using it as a time out and it not being structured [is a problem]."

The interviewees from both schools were keen to point out that their MSE was intended as an educational resource, rather than as a leisure option. Interviewees from School 1 stated: "The sensory room is regarded as a strategy for supporting children's learning." Interviewees from School 2 commented: "that [building cognitive skills] is what we are doing in all of our programs, isn't it? Improving cognitive skills in all our programs, in our cooking programs and swimming programs and academic programs. It's just another learning opportunity."

Related to this theme of leisure activities, and again only in response to a direct question, the use of the MSE to identify activities that students preferred and that could be passed onto families was briefly noted by School 1. The leisure theme was raised again in response to questions about specific benefits when the interviewees from both schools noted that the MSE provided an additional place for students to go to. Interviewees from School 1 commented: ". . . like their siblings go to sport. So it is just another place for our

students to go. None of them get to go to friends' places after school, or what-have-you." School 2 interviewees commented in response to a question about any benefits that had not been discussed already that: "I just think it's a different environment for the kids to experience that they wouldn't experience if we didn't have it, or they didn't have access outside of school to visit one."

Building trust and relationships. The role of MSEs in building trust and positive relationships was addressed in both schools, but only in response to direct questions. Interviewees from School 1 saw the MSE as supporting relationships, but certainly not as a primary tool for developing them: "I think we all have a positive relationship with our students to begin with." They did describe one student, however, where they believed trust was an issue: "She will now go into the sensory room and is not concerned because she sort of built up . . . I don't know whether she's built up the trust with the room, or if she's built up the trust in the teacher, or whatever. But I suppose some kids are sort of anxious going into a dark room, so you have to work on that." Interviewees from School 2, also agreed with this effect in response to a direct question and in accord with their overall focus on the calming and relaxing effect stated: "Everyone is fairly relaxed and it's a nice opportunity . . . And decent interaction, whether its through touch, massage, or . . ."; "When you go in there everybody is gentle, is gentler and softens and they are more receptive to you as well. And you are more giving."

Choice and control. Interviewees from School 2 made several mentions of the use of the room to provide the opportunity for control and choice to their students: "They can control the movement of them [fibre optics] too. It's something they can do. There's very little they can do usually but they can grasp these and move them and they feel like they are creating the dance of the lights and the movement and the colours"; "they develop preferences, they develop their interest areas and they'll go back to the same ones, so they have got their little choice sections." In response to a question about the use of switches, interviewees from School 2 noted that: "I think it [use of switches] allows kids to have . . . to make choices." In response to a direct question about the use of the room for providing students with control, interviewees again returned to the use of the MSE to provide choices: "opportunities to control their environment, which I'm sure that they feel that they don't have most of the time especially the high support students, and we give them the opportunities in there for choice making. Choice making of activities, choice making of colours, choice making of being involved in a switch game, choice making with boxes and different tactile things that they can choose from and that is definitely one of the benefits for them." Although the use of switches to control equipment was raised in the general discussion of transfer of skills between classrooms and MSEs, the issue of providing students with control in an MSE was only raised in response to a direct question to the interviewees in School 1, and they agreed this was a benefit: "Oh yes! It empowers them to make a change to achieve success. It's wonderful."

Themes Raised by School 1 Only

Enjoyment. The interviewees from school 1 mentioned students' enjoyment as a factor in the use of the MSE, and as a factor to consider when deciding which piece of equipment might be used: "By having everything on, you bring children in and just move them to where they are happy . . . You can use the room for one day to really concentrate on one child's goal, the others might be enjoying themselves"; "If they don't develop we've lost nothing. They've enjoyed it."

Failure-free environments. A theme from School 1 that only emerged in response to direct questions was the benefits of an MSE in providing a failure-free environment: "For our children to experience success is so absolutely necessary and sometimes we have to set up the environment . . . well often, not sometimes, a no fail environment for them. The sensory room is really a no fail environment that's just laid out for them and that's really important." This aspect of use was not mentioned at all by School 2.

Eliciting responses. Interviewees from School 1 commented on the potential of the MSE to bring about some kind of response from the student that teachers may then build on: "The

optic lights are very good because you can put them right under them, and they will touch them and they will feel them on their face, which might elicit a response from the hands and the lights changing colour," "All you can do is look at some of the awareness of some of the responses that the kids are giving and just build on those. Sometimes it works and sometimes it doesn't." In relation to this theme, the interviewees referred twice to one specific incident where a student with cortical blindness and other disabilities was using the sound bed, and then appeared to track images projected on the ceiling. They noted: "One can never prove what she was feeling and hearing. Being on the bed was stimulating other senses and she was suddenly aware that something was moving. So her body was sort of waking up." They returned to their belief about the impact of the room on students with cortical blindness again, in response to specific questions about the use of the room: "So, I believe and I guess if we didn't believe this we wouldn't bother doing it, but for those kids giving them a lot of concentrated stuff in a structured visual environment can possibly, hopefully, improve their visual perception and they might be seeing something other than this total blur of things." This theme was not raised at all by the interviewees from School 2, perhaps because their population contained many more students without physical disabilities.

Themes Raised by School 2 Only

Cause and effect. School 2 was the only school to note the use of equipment in the room to teach cause and effect relationships: "Because nothing would happen unless . . . it [sound-activated equipment] was very cause and effect . . . it was the most basic cause and effect"; "I think it [switch use] allows kids to have . . . to make choices and within the room. And also to get that cause and effect."

Interaction between students. Interviewees from School 2 described the use of the MSE to promote interaction between students: "You could give half their optic fibres to N who's in a chair and I could have my other student M sitting next to N playing with the other half. So you can have some interaction happening just with one activity such as the optic fibres." In response to a direct question about MSEs as a motivator, interviewees commented on the use of switches to promote interaction: "It [switch use] is a skill and a participatory activity. They can join in, in a way that they can't join in, they'll miss out if you're doing table work. And this way they can have their turn and they can communicate."

Problems Using the MSE

Both schools described some problems they had encountered in using their MSEs, both spontaneously and in response to direct questions. Interviewees from School 1 noted one student who had been very destructive in the room and another who took some time to get accustomed to being in the dark room. They noted that the purported benefits of using the MSE could not always be exploited because students had to go to recess or lunch breaks. They thought that the use of projected images on the ceiling may not be useful for some students with vision impairments. They were also concerned about possible negative effects from overstimulation and the need for care: "that we aren't overstimulating them and we're not pushing them over the edge because it's excessive stimulation." Interviewees from School 2 raised the problem of noise in the room setting off equipment designed to respond to sound, rather than sounds produced intentionally by the students.

Both schools were aware that staff using the room as a time out, or without any plan in mind was a problem. Interviewees from school 1 said: "We've always been keen or we've made sure that no one ever says, 'we're doing sensory this afternoon'" while interviewees from School 2 said: "I mean I would hope staff don't use it as a time out, because they're going in there and that's my biggest fear. People just going in there and put a video on and that's it." Interviewees from School 2 raised the issue of physical closeness to students in the MSE and questioned whether that may have crossed "all the boundaries of child protection."

In response to questions directly about problems or disadvantages, interviewees from both schools mentioned equipment failure and breakage. Interviewees from School 1 mentioned difficulty keeping power cords out

of the reach of all students, and making equipment accessible for all children (particularly a touch screen and items fixed to the walls). Interviewees from School 2 raised the problem of people not using the room in a structured way, and also noted problems with people not cleaning up after sessions and putting things away.

Planning and Specific Goals in the MSE

As is evidenced by some of the comments above in relation to problems with the room, interviewees from both schools agreed that use of the MSE should be planned and structured, however interviewees did not provide much detail on planning, goal setting, monitoring and evaluation of educational activities in the MSE. School 1 interviewees suggested they had some flexibility in planning, but provided little specific information about any formal programming procedures: "and we've sort of looked at knowing where we want to go, but being prepared on the way to change direction if something comes out that you weren't anticipating, follow that route and keep going. . . . so, we've never sort of said what are we doing to achieve that, well I was going there but now I'm ending up here. . . . sometimes we can't anticipate where they might end up, but by acute observation and awareness on the teachers' part we can lead them where they're taking us. . . ." Another comment suggested that use might be relatively open-ended, at least at first: "I think that perhaps from an educational point of view, the thing that's made us more acutely aware of is the powers of observation, for us, to just keep watching, looking for the tiniest changes and then working out what might have elicited those changes." The interviewees also noted that although some forms for monitoring were available, they were not necessarily used: "we do have sensory room sheets that can be . . . teachers can fill things in while you're over there, about children's responses, but mostly they remain in one's head until later. I guess with only six children in the class it's easier to remember six individual kids than to collect and write it down."

Interviewees from School 2 were more explicit about the need for planning: "I think the sensory room has to be a structured environment and you need to go in there with a plan. You need to know where you . . . what you want to get out of the lesson and what you want to get out of each equipment. And what you want to target for each of the students"; "Some people have structured assessment charts that they use. Other teachers probably just make observational notes and things like that and they also report. If you look at the IP [individual plan] goals for every student there'll be something based on the sensory room for those IP goals."

Discussion

Both schools appear to have been early-adopters of the MSE concept in Australia as both reported having MSEs by 1995. Use of MSEs in educational settings appears to have emerged during the late 1980s to early 1990s, and certainly by 1995 material on their use in schools was appearing in books about the education of students with severe disabilities in the UK (Bozic, 1997). It should be noted that some of these books (e.g., Hutchinson & Kewin, 1994) were published by ROMPA the firm that trademarked snoezelen and which remains a major supplier of equipment for MSEs. The adoption in both schools seems to have been driven by interested staff, and at School 2 external support staff and therapists played a role. Both reported considerable and ongoing expenditure on the MSEs they installed, and extensive use across their schools.

Neither school reported any awareness of the literature on MSEs, either of the reservations expressed about their use and the lack of empirical support, nor of the more sympathetic literature. Both schools seem to have depended on suppliers of equipment for information about MSEs, and used catalogues, sales-people (in school 1) and Internet sites to find out about MSEs. The only source that could be specifically identified, apart from suppliers was Flo Longhorn's book, which promotes a sensory curriculum also without empirical support. School 1 had read a popular account of snoezelen work, but explicitly rejected the aim of relaxing their students.

There were cautions being expressed about the use of MSEs in schools by the mid-90s. Cavet and Mount (1995) and Mount and Cavet (1995), writing about MSEs as a leisure

option, noted the specialised nature of MSEs and raised doubts about the use of MSEs in preference to more normalised and integrated activities. They also called into question the claims made about positive effects and commented that if MSEs were used as originally conceptualised as a leisure option, claims made for therapeutic effects are irrelevant. Mount and Cavet commented that the research reported to that date was observational, depending on staff feedback and reported on very few participants and expressed concern about the use of MSEs in educational environments.

School staff, who were obviously highly motivated to provide what they considered were quality programs for their students, were apparently uncritical and accepting of the claims made by commercial providers. It may be unreasonable to expect school staff to carry out extensive research to establish the evidence-base for new and emerging practices, but one might expect education authorities such as NSW DET to provide advice on such a resource intensive development in schools. Certainly after the first reviews indicating the questionable support for the claimed benefits of MSEs, it could be expected that authorities would be more circumspect in providing both tacit support and funding, and may even have carried out some formal evaluation of the use of MSEs. Neither school reported receiving any formal guidance from NSW DET, either in provision of support or of cautions or to support an evaluation of the use of their MSE. School 1 indeed, received financial support from NSW DET to further develop their MSE. Both schools received funding from other sources, and this situation brings to mind the comment by Mount and Cavet (1995) that it may be easier to get funding for "tangible, novel and specialist equipment" (p. 54) than for adequate training of staff.

Other researchers have explored teacher perceptions and use of MSEs, and the teachers in those studies have expressed thoughts both similar to and different from the teachers in the study reported here. Bozic (1997) who interviewed staff in four schools identified two interpretations of the use of MSEs, one that focused on child-led activities to relax the child and provide an enjoyable experience and one focused more on teacher-directed activities aimed at developing child skills in a stimulating distraction-free environment. Although both our schools accepted that enjoyment was an element in the use of MSEs, both saw them as a teaching resource rather than as leisure option and both commented on the lack of distractions, particularly in the black areas.

Teachers at the Australian school for students with disabilities (some of whom lived in group homes) that were interviewed by Pagliano (1997, 1998) did not make a distinction between the use of the MSE for leisure or education, as the teachers in our interviews did. The teachers he interviewed did provide many comments similar to those of the interviewees in this study and the theme that exposure to sensory stimulation is intrinsically beneficial was prominent. The MSE was seen primarily as a place for relaxation, enjoyment and for child-directed exploration. The school explicitly rejected a positivist research approach that might have demonstrated observable and tangible outcomes. The teachers in this school described the MSE as a setting for physiotherapy interventions and assessment (for example measuring joint ranges while children were relaxed), a use that was not mentioned at all by our participants. Pagliano (1997) noted that these teachers continued to use conventional strategies of instruction and that the emphasis on leisure may have been due to the proportion of children not living with their families.

MSEs are claimed to both relax and stimulate and it was interesting that School 1 focused on the stimulation provided, while School 2 focused on the calming and relaxing effects. The benefits of sensory stimulation as valuable in itself were only mentioned by the interviewees at School 2 when the issue was directly raised with them. Both schools seem to be framing their view of their MSE to align with their views of the needs of their students. Neither school disagreed with any of the purported benefits when they were asked about them directly. Although schools were asked about how they used the rooms for assessment and intervention, and agreed that use of the MSE should in the main be planned, little specific information was provided about how this was actually done. The overriding impression from the interviews is that use of the MSE

or specific pieces of equipment in it, particularly if that use is enjoyed by the students, will have benefits. It is a concern that apart from teaching the use of switches, few functional skills appeared to be addressed in MSEs. Schools did claim that skills generalised from classroom to MSE and vice versa, in contrast with most of the available research evidence, and noted that activating the equipment in the MSE may provide more motivation for switch use.

Available evidence on MSEs indicates that the quality of studies is generally poor, results are equivocal, and the functionality of outcome measures are often questionable. In contrast, teachers in the present study perceived a wide range of potential benefits from the use of MSEs and in most cases these were very general in nature. Given the history of MSEs, it may not be unreasonable to assume that they will continue to be used and possibly expanded in school settings. Consequently, a valid question to be asked is how they should be resourced, used and monitored? A starting point would be to address the apparent policy and procedures vacuum relating to MSEs. It appears that NSW DET have provided little information and guidance to schools about MSEs, particularly considering the resources and time they consume. One important first step would be to provide teachers with current information on the state of research on MSEs so that they are fully informed in their decision-making. Teachers in the current study viewed educational outcomes as the critical features of use of MSEs, as opposed to passive leisure. Given this, and that MSEs remain an unproven intervention, a policy might be considered requiring specific measurable outcomes for all children using MSEs. This might involve measuring both changes in the MSE setting and generalised changes in performance or behaviour in classrooms. Such an approach may assist teachers to focus their programs and outcomes and provide a mechanism to objectively verify impressions about benefits. Given both the unverified nature of the MSE intervention and costs involved, this would not seem an unreasonable strategy and may well open the possibility of more formal research on the effects of MSEs in schools.

Overall the interviewees seem to have accepted the validity of the claims for the benefits of MSEs made by equipment suppliers although these are not supported by research. It is of concern that NSW DET has not provided more information about MSEs, given the resources they consume. Teachers report seeing benefits that have not been demonstrated in controlled research studies, and there is certainly a need for more research on the effects of MSEs when used with small groups of children as they are in schools. Nevertheless, it is a concern that considerable resources are being provided for MSEs that could be used for the provision of evidence-based interventions to students with severe disabilities.

Mount and Cavet asked a set of questions about MSEs in 1995 (p. 54):

> Could alternative everyday curriculum or community experiences be offered which would generate similar responses and have similar appeals? How is the effectiveness and relevance of such an environment monitored and evaluated over the short and long term? How are individual responses and progress recorded and developed? Could the money spent have been allocated to other ways of improving the experiences of children and young people with learning difficulties?

We could ask the same questions today.

References

Botts, B. H., Hershfield, P. A., & Christensen-Sandfort, R. J. (2009). Snoezelen®: Empirical review of product representation. *Focus on Autism and Other Developmental Disorders, 23,* 138–147.

Bozic, N. (1997). Constructing the room: Multisensory rooms in educational contexts. *European Journal of Special Needs Education, 12,* 54–70.

Cavet, J., & Mount, H. (1995). Multisensory environments. In J. Hogg & J. Cavet (Eds.), *Making leisure provision for people with profound learning and multiple disabilities.* (pp. 67–85). London, UK: Chapman & Hall.

Chan, S., Fung, M. Y., Tong, C. W., & Thompson, D. (2005). The clinical effectiveness of a multi-sensory therapy on clients with developmental disability. *Research in Developmental Disabilities, 26,* 131–142.

de Bunsen, A. (1994). A study in the implication of the Snoezelen resources at Limington House School. In R. Hutchinson & J. Kewin (Eds.), *Sen-*

sations and disability: Sensory environments for leisure, snoezelen, education and therapy. (pp. 138–162). Chesterfield, UK: Rompa.

Fowler, S. (2008). *Multisensory rooms and environments: Controlled sensory experiences for people with profound and multiple disabilities.* London, UK: Jessica Kingsley.

Gallaher, M., & Balson, M. (1994). Snoezelen in education. In R. Hutchinson & J. Kewin (Eds.), *Sensations and Disability* (pp. 129–137). Chesterfield, UK: Rompa.

Hirstwood, R., & Smith, C. (1996). Developing competencies in multi-sensory rooms. In N. Bozic & H. Murdoch (Eds.), *Learning through interaction, technology and children with multiple disabilities.* London, UK: David Fulton.

Hogg, J., Cavet, J., Lambe, L., & Smeddle, M. (2001). The use of "Snoezelen" as multisensory stimulation with people with intellectual disabilities: A review of the research. *Research in Developmental Disabilities, 22,* 353–372.

Houghton, S., Douglas, G., Brigg, J., Langsford, S., Powell, L., West, J., et al. (1998). An empirical evaluation of an inter-active multi-sensory environment for children with disability. *Journal of Intellectual and Developmental Disability, 23,* 267–278.

Hulsegge, J., & Verhuel, A. (1987). *Snoezelen: Another world.* UK: Rompa

Hutchinson, R., & Kewin, J. (1994). *Sensations and disability.* Chesterfield, UK: Rompa.

Lai, C. Y. (2003). The use of multisensory environments on children with disabilities: A literature review. *International Journal of Therapy and Rehabilitation, 10,* 358–363.

Lancioni, G. E., Cuvo, A. J., & O'Reilly, M. F. (2002). Snoezelen: An overview of research with people with developmental disabilities and dementia. *Disability and Rehabilitation, 24,* 175–184.

Meijs-Roos, K. (1990). Effect van 'snoozelen' op het gedrag en kennelijk welbevinden van diepzwakzinnigen. *Nederlands Tijdschrift voor Zwakzinnigenzorg, 7,* 144–150.

Mount, H., & Cavet, J. (1995). Multi-sensory environments: An exploration of their potential for young people with profound and multiple learning difficulties. *British Journal of Special Education, 22,* 52–55.

Pagliano, P. (1997). The use of a multisensory environment in the education of children with severe multiple disabilities. In M. Caltabiano, R. Hill & R. Frangos (Eds.), *Achieving inclusion: Exploring issues in disability.* (pp. 73–93). Townsville, QLD: Centre for Social Welfare Research, James Cook University.

Pagliano, P. (1998). The multi-sensory environment: An open-minded space. *The British Journal of Visual Impairment, 16,* 105–109.

Pagliano, P. (1999). *Multisensory environments.* London, UK: David Fulton.

Shapiro, M., Parush, S., Green, M., & Roth, D. (1997). The efficacy of the "snoezelen" in the management of children with mental retardation who exhibit maladaptive behaviours. *British Journal of Developmental Disabilities, 43,* 140–155.

Sin, K. F., & Kwok, L. M. (1999). Effects of visual activities of multisensory room on visual function of children with severe grade mental retardation and severe visual impairment. In K. F. Sin & L. L. Kwok (Eds.), *Utilization of the Multisensory Room.* (pp. 56–62). Hong King: Caritas Lok Yan School.

Stephenson, J. (2002). Characterisation of multisensory environments: Why do teachers use them? *Journal of Applied Research in Intellectual Disability, 15,* 73–90.

Stephenson, J. (2004). Controversial practices in the education of students with high support needs. *Journal of Research in Special Education Needs, 4,* 58–64.

Weinstein, M. (2008). *TAMS Analyser: A qualitative research tool* (Version 3.44) [Computer Software]. Tacoma, WA: Mayday Softworks.

Withers, P. S., & Ensum, I. (1995). Successful treatment of severe self-injury incorporating the use of DRO, a snoezelen room and orientation cues: A case report. *British Journal of Learning Disabilities, 23,* 164–167.

Received: 11 March 2010
Initial Acceptance: 1 May 2010
Final Acceptance: 15 July 2010