

The Use of Multi-Sensory Environments in Schools Servicing Children with Severe Disabilities

Mark Carter · Jennifer Stephenson

Published online: 25 October 2011
© Springer Science+Business Media, LLC 2011

Abstract Multi-sensory environments (MSEs) are reportedly being increasingly used in schools but there is little research on funding, rationale, ways they are used and perceived benefits. A survey was conducted of special schools enrolling children with severe disabilities in New South Wales, Australia. More than half the 36 responding schools reported having a MSE installed. Schools typically relied on advice from other teachers, therapists and equipment suppliers in their decisions to install MSEs, with very little examination of research. A wide range of uses and benefits were reported, with limited emphasis on active teaching of skills. There was a widespread acceptance of the inherent value of sensory stimulation. Policy implications for school systems considering or using MSEs are discussed.

Keywords Multi-sensory environments · Snoezelen · Evidence-based practice · School

Snoezelen[®] rooms, more generically referred to as multi-sensory environments (MSEs), are spaces designed to provide sensory stimulation to users through a range of visual, auditory, tactile and olfactory equipment (Bozic 1997). The approach was originally developed in the Netherlands to provide leisure options for adults with severe disabilities (Bozic 1997) but has been increasingly employed in school settings in Great Britain (Bozic 1997), Australia (Stephenson 2002) and North America (Botts et al. 2008). Further, MSEs are promoted as an educationally valid intervention (Fowler 2008; Lai 2003). In this light, several reviews have been conducted of research examining the efficacy of MSEs (Botts et al. 2008; Hogg et al. 2001; Lai 2003; Lancioni et al. 2002; Lotan and Gold 2009).

Author Note This research was supported by a Macquarie University Teachers for the Future Fund grant. IRB approval was obtained for this study.

M. Carter (✉) · J. Stephenson
Macquarie University Special Education Centre, Macquarie University, Sydney, NSW 2109, Australia
e-mail: mark.carter.mq@gmail.com

Only a small number of studies on MSEs exist and methodological quality is typically poor (Botts et al. 2008; Hogg et al. 2001; Lai 2003; Lancioni et al. 2002; Lotan and Gold 2009). While some positive outcomes have been reported, results are often inconsistent (Botts et al. 2008; Hogg et al. 2001; Lai 2003; Lancioni et al. 2002) and most reviewers have concluded that there is limited evidence of meaningful generalization of behavior change outside the MSE (Botts et al. 2008; Hogg et al. 2001; Lai 2003; Lancioni et al. 2002), which is a critical consideration if MSEs are to be regarded as a useful educational intervention. Perhaps the most positive review of MSEs has been offered by Lotan and Gold (2009) who focused on individualized Snoezelen therapy, which is not typical of delivery in school environments. Nevertheless, Lotan and Gold (2009) appropriately concluded the various defects in the body of research examined “prevent a confirmation of this method as a valid therapeutic intervention at this time” (p.207). Thus, available data do not allow conclusions to be drawn about the efficacy of MSEs and the intervention certainly does not meet the standards for an evidence-based practice (Botts et al. 2008).

While some of the equipment used in MSEs is simple and readily available, much is specialized and commercial companies have developed to supply such items (e.g., ROMPA, SpaceKraft, FlagHouse). The cost of equipment alone can easily run into tens of thousands of dollars (see McKee et al. 2007; Stephenson and Carter 2011b) and additional costs are involved in providing a room to house the equipment and other infrastructure. The distributor of Snoezelen[®] brand products in the United States have reported that one school raised \$2 million for MSEs (FlagHouse 2010a). Thus, establishing a MSE may well be a considerable impost on a school directly as well as involving an associated opportunity cost.

An underlying rationale in the literature for the use of MSEs appears to be a conviction that sensory stimulation is inherently beneficial for individuals with severe disability (Ayer 1998; Gallaher and Balson 1994; Lai 2003; Mount and Cavet 1995), either in its own right or to the process of learning. Pagliano (1997) argued that “when working with individuals with severe multiple disabilities an appeal to primary sensations is a more immediately powerful means of contact than traditional teaching using an initial appeal to intellectual capabilities” (p. 73). While the conviction that (often non-specific) sensory stimulation is inherently beneficial appears to be almost universal for advocates of MSEs, explanation of the underlying mechanism is typically absent or non-specific.

Several authors, however, have linked the rationale for MSEs to sensory integration theory (Botts et al. 2008; Shapiro et al. 1997; Stadele and Malaney 2001), despite the lack of convincing evidence for this approach (Botts et al. 2008; Hyatt et al. 2009; Leong and Carter 2008). It has been noted that some specific instances of stereotypic or self-injurious behavior may be maintained by sensory stimulation (Martin et al. 1998; Shapiro et al. 1997). It has also been postulated that individuals with severe disability, particularly those in institutional settings, may suffer from deprivation or restriction of normal sensory input (Schofield and Davis 1998). While this is highly speculative and there appears to be little, if any, direct empirical support, it may not be totally implausible in institutional settings. It appears a much less plausible hypothesis, however, for children living in home and community environments. It has been suggested that a MSE approach may in fact

even have protective effects on the brain in the case of children with Rett syndrome (Lotan and Shapiro 2005). Pagliano (2006) has offered a preliminary attempt to develop a theoretical explanation for the effects of MSEs but this is clearly speculative and at this stage has no empirical support. Realistically, it is unlikely that any single rationale would have the explanatory power to account for the vast array of claimed benefits and effects of MSEs in the literature and the suggestion of Hogg et al. (2001) that there is a need to develop a clearer theoretical basis for the approach seems well justified. Given the poorly justified conceptual basis for the benefits of sensory stimulation, it is certainly of interest to determine how deeply this rationale has permeated the beliefs of schools using MSEs.

There have been reports of increasing popularity of MSEs in a number of countries (Botts et al. 2008; Bozic 1997; Lai 2003; McKee et al. 2007; Pagliano 1998). While acknowledging that the exact number of installations is unknown, Botts et al. (2008) note that one product distributor reports over 700 installations in North America (see FlagHouse 2010b). Despite the claimed increasing use of MSEs, there are few studies examining their use in the school system with regard to rationale, sources of information used, cost, ways in which MSEs are employed, perceived benefits and problems.

Pagliano (1997, 1998) presented the results of two qualitative studies that appeared to be conducted in the same Australian special school. Bozic (1997) employed discourse analysis to identify two different approaches to MSEs in four English schools while Ayer (1998) conducted a qualitative study to examine the use of MSEs in a variety of English convenience sample settings, including two schools. Most recently, Stephenson and Carter (2011a, 2011b) have reported two studies conducted in two Australian special schools, who were early adopters of MSEs.

Thus, our existing information on how and why MSEs are used in school systems comes exclusively from qualitative studies. While these studies have provided detailed insight into the rationale, decision-making processes and beliefs of specific schools, the findings cannot be generalized beyond these specific organizations (Bozic 1997; Pagliano 1997). The present study involved a state-wide survey of special schools in New South Wales (NSW), Australia, regarding the use of MSEs. Specifically, the questionnaire addressed: (a) the history and funding of the MSE; (b) reasons for installation; (c) sources of information considered in decision-making; (d) types of equipment installed; (e) processes for educating staff in the use of the MSE; (f) ways in which the room is used; (g) perceived benefits to the students; (h) problems or disadvantages associated with the MSE.

Method

Background

NSW is the most populous state in Australia, accounting for approximately 32% of the total population (Australian Bureau of Statistics 2009) and the NSW Department of Education and training is reportedly the largest educational provider in the southern hemisphere (Graduate Opportunities n.d.). Within the NSW schools system, a cascade of provisions is available to students with special needs ranging from placement in

regular classes to special schools. While a large number of students with milder disability are accommodated in regular classes and special classes within regular schools, the vast majority of students with severe disability are accommodated within special school settings (New South Wales Department of Education and Training 2009).

Distribution

The questionnaire was distributed by post to all 50 government special schools servicing children with severe intellectual disabilities in NSW. A reply paid envelope was included for return of the questionnaire. The questionnaire was addressed to the school Principal with the request that it be directed to a representative who would be in the best position to provide the information. Schools were requested to return the letter within a month and a reminder letter was sent to all schools after that period.

Questionnaire Construction

The questionnaire was prefaced by an information and consent page outlining the purpose of the research and documenting approval of the relevant ethics committees. If schools did not have a MSE, they were asked to tick a box to indicate this fact and return the survey form uncompleted. The questionnaire was divided into 10 sections. The first addressed background about the school and use of the MSE. Schools were asked to provide the number of students enrolled, number of classes, the number of classes that used the MSE on a regular basis, number of sessions per week classes who use the MSE regularly accessed the room, whether students used the room outside regular class time (e.g., recess and lunch breaks) and whether outside groups use the MSE. The second section addressed the history and funding of the MSE. The first question asked how old the MSE was (more than 10 years, between 5 and 10 years, less than 5 years) and the second whether it was significantly updated since installation (yes/no). Schools were then asked to provide an estimate of the cost of the MSE. In the final question, schools were provided with a list of 10 funding sources and asked to circle those that had been used to raise money for the MSE and its equipment. The list included an “other” category to allow schools to add unlisted sources. In the third section schools were asked to indicate why they installed the MSE from a list of 14 possible reasons derived from Stephenson (2002) and Stephenson and Carter (2011a, 2011b), again with the addition of an “other” category. In Section 4, schools were asked to indicate sources of information used when they were considering installing an MSE from a list of 14 options, including an “other” category. Section 5 addressed the equipment installed in the MSE and respondents were asked to select from a list of 44 options derived from several sources (Stephenson and Carter 2011a; Stephenson and Carter 2011b), again with the addition of an “other” category. Section 6 addressed how staff learned to use the MSE and participants were presented with three open-ended questions:

1. Do you have manuals, policies and procedures for the use of the MSE or equipment within it? If so, briefly describe them.
2. Do you have material to assist staff in programming for sessions in the MSE? If so briefly describe them.

3. Do you provide professional learning opportunities for staff related to the use of the MSE? If so, briefly describe them.

The functions of the MSE were addressed in Section 7 and respondents were asked to indicate the uses that teachers made of the room from a list of 20 options including an “other” category. The response options were derived from Stephenson (2002) and Stephenson and Carter (2011a, 2011b). In Section 8, participants were asked to indicate the benefits to their students from the use of the MSE from a list of 21 options including an “other” category. Section 9 addressed possible problems and disadvantages of MSE use and respondents were asked to select from a list of 10 options, derived from Stephenson and Carter (2011a, 2011b), with the addition an “other” category. The final section was optional and consisted of one open-ended question. Respondents were asked whether they had any other comments on the use of MSEs for students with severe disabilities.

Results

Response Rate

A total of 36 schools returned the questionnaire, a response rate of 72%. Seventeen schools indicated they did not have a MSE installed. One of these also completed the questionnaire but this response was discarded from the analysis leaving 19 completed responses.

School Characteristics and MSE Use

The mean number of students enrolled in the schools was 64.5 ($SD=5.6$), the mean number of classes was 10.2 ($SD=3.4$) and mean number of classes using the MSE was 5.7 ($SD=1.4$). When analysis was limited to schools that provided both the number of classes and number using the MSE, a mean of 5.6 classes from a total of 9.2 used the MSE.

In response to the question regarding how many sessions would classes who use the MSE regularly have in the room, schools generally provided a range. A total of 14 (73.7%) schools indicated classes accessed the MSE 1–2 times per week, one (5.3%) school indicated access 1–3 times per week, two (10.5%) schools indicated access 2–3 times per week, one school indicated access three or more times a week and one school indicated the MSE was accessed 7–14 times a week. A total of 13 (68.4%) schools indicated students did not access the MSE outside regular class time, five (26.3%) indicated the MSE was used outside regular class time and one school indicated that it was used in wet weather only. All schools clearly stated that the MSE was not used by outside groups although a single school indicated that they were attempting to encourage such use.

History and Funding

Three schools (15.8%) reported that their MSE was more than 10 years old, nine (47.4%) stated it was 5–10 years old and the remaining seven (36.8%) stated it was

less than 5 years old. Thirteen (68.4%) of schools indicated that the MSE had been significantly updated since installation. Information on the cost of the MSE and its equipment was provided by 15 (78.9%) schools including 1 that just provided data on the latest update. This ranged from \$1,200 to \$80,000 with a median of \$24,000.

Schools accessed a mean of 3.1 funding sources. Ranked by frequency, these were school funds (68.4%), parent fund-raising (63.2%), donation from a community organization (47.4%), donation from a business (42.1%), specific MSE related charity or committee (26.3%), donations from individuals or families (26.3%) and other (21.1%). Government funding was lowest ranked with special State government Department of Education and Training funding at 10.5% and Federal Government funding at 5.3%.

Rationale

In relation to the question about why schools installed a MSE, schools nominated a mean of 4.4 reasons (including the “other” category) and these are detailed in Table 1. Three reasons for installing a MSE were nominated by over 60% of schools. These were benefits described by other teachers and schools, the philosophical appeal of the multi-sensory approaches and advice from therapists. All remaining sources were used by less than 40% of schools. Approximately 30% of schools reported that research on efficacy was considered in the decision, slightly below benefits as described in catalogues from equipment suppliers.

Sources of Information

Schools nominated a mean of 5.1 sources of information (including the “other” category) that were considered when installing the MSE and these are detailed

Table 1 Percentage of schools ($N=19$) nominating reasons for establishing MSE

Reason	%
Benefits described by other teachers or schools	73.7
Philosophical appeal of a multi-sensory approach	73.7
Advice from therapists	63.2
Benefits as described in catalogues from equipment suppliers	36.8
Research evidence about efficacy	31.6
Advice from itinerant support teachers or other Department of Education and Training personnel	31.6
Benefits described in a book	31.6
Benefits described at a conference	31.6
Benefits described in professional magazines	26.3
Other	15.8
Benefits described on internet sites	10.5
Advertising on internet	10.5
Advertising in print media	5.3
Benefits described in a university course	0.0

in Table 2. Four sources of information were most commonly accessed in schools' decision-making. Information from other schools and teachers were each used by over 75% of schools. Suppliers of equipment and occupational therapists were both used by more than 60% of schools. All remaining sources were used by fewer than 40% of schools. Information from academic journals and university courses were used by 21.1% and 0% of schools respectively.

Equipment

Schools indicated a mean of 17.5 types of equipment were used, excluding the "other" category, where multiple types of equipment were typically reported. Equipment nominated by more than 65% of schools included, sound (music) equipment (84.2%), bubble tubes or columns (78.9%), color wheels for spotlights or projectors (78.9%), effects projection equipment (73.7%), fiber optics (73.7%), tactile objects (73.7%) and standard student controlled switches (68.4%). Five (26.3%) schools nominated "other" responses, listing a range of varied equipment.

Training, Policies and Procedures

Answers to the three questions about training, policies and procedures often overlapped, so all were examined in extracting information. With regard to manuals, policies and procedures, 11 schools stated one or more of these existed, although some appeared minimal from the detail provided. For example, two schools indicated that generic books and materials on MSEs were available in the school library and one school indicated that they rotated equipment to maintain student interest. One school indicated that they were

Table 2 Percentage of schools ($N=19$) nominating sources of information used when establishing MSE

Source of information	%
Other schools that had MSEs	89.5
Teachers at this school	78.9
Suppliers of equipment for MSEs (sales people or catalogues)	68.4
Occupational therapists	63.2
Books about MSEs	36.8
Information from a conference	36.8
Information from a professional learning activity	31.6
Parents	26.3
Sources on internet	26.3
Itinerant support teachers or other Department of Education and Training personnel	21.1
Information from academic journals	21.1
Other	10.5
Information in newspapers or magazines	0.0
Information from a university course	0.0

currently developing manuals, policies and procedures but they were not currently in place. Overall, the policies and procedures described primarily focused on the mechanics of room and equipment use. Ten (52.6%) schools stated that they had material to assist staff with programming and 13 (63.2%) schools indicated that they provided professional learning opportunities, including one school who stated that this involved visiting other sites with MSEs.

Purpose

Schools indicated that they used MSEs for a wide variety of purposes with a mean number of 12.7 uses being reported. Details are provided in Table 3. The two highest nominated uses of MSEs were (1) providing an enjoyable experience and (2) relaxing and calming anxious students. Of the next three highest ranked items, two were passive in nature (passive leisure activity and providing students with sensory experiences) and the remaining item addressed teaching of communication skills. Of the eight uses that were nominated by over 70% of schools, only two (teaching communication and cause and effect) involved active teaching of skills. In contrast, of the next eight ranked uses (i.e., ranks 9–16), seven involved teaching of skills. Excluding the small number of other responses, assessment filled the last three rankings. The three “other”

Table 3 Percentage of schools ($N=19$) reporting purpose for use of MSEs

Purpose	%
Provide students with an enjoyable experience	94.7
Relax and calm students who are anxious	94.7
As a passive leisure activity	89.5
Teach/practise communication skills, such as choice making	89.5
Provide students with a range of sensory experiences	89.5
Teach/practise cause/effect relationships	84.2
Relax and calm students who are exhibiting challenging behavior	78.9
Provide students with opportunity to demonstrate awareness	73.7
Teach/practise use of switches to activate equipment	68.4
Encourage students to reach and grasp	68.4
Teach/practise fine motor skills in using equipment	63.2
Teach/practise skills in self-direction by choosing equipment to use	63.2
Teach/practise visual tracking	57.9
Provide students and staff with a setting in which they can build relationships	52.6
Teach appropriate use of equipment (e.g., without throwing or mouthing)	52.6
Teach/practise other visual skills	47.4
Assessment of cognitive skills	31.6
Assessment of motor skills	31.6
Assessment of vision and/or hearing	21.1
Other	15.8

responses were establishing expectations of behavior, sensory stimulation and providing massage.

Benefits

Schools nominated a mean of 12.5 benefits of the use of MSEs and these are presented in Table 4. Sensory stimulation was nominated by all but one of the schools as a benefit. Opportunity to relax and reduction of anxiety were also nominated by more than 80% of schools.

Problems or Disadvantages

Schools nominated a mean of 4.4 problems or disadvantages associated with the MSEs and these are summarized in Table 5. Four issues clearly stood out in the responses, with cost of maintaining equipment being the most cited concern (63.2%), closely followed by safety issues, keeping the MSE tidy and difficulty supervising more active students. None of the remaining concerns were reported by more than 35% of schools. Of the schools nominating the “other” category, two mentioned lack of funds, two problems with space and one noted that the room was not set up to be suitable for older students.

Table 4 Percentage of schools ($N=19$) reporting benefits of use of MSEs

Reported benefit	%
Sensory stimulation	94.7
Opportunity to relax—a break from the demands of others	89.5
Reduction in anxiety after using the MSE	84.2
Opportunity to focus on tasks away from other distractions	73.7
Motivator to learn (such as communication and/or motor skills, switch use)	73.7
Opportunity to control the environment (through switches for example)	73.7
Improvement in visual tracking or other vision skills	68.4
Calming agitation and improving challenging behavior within the MSE	68.4
Opportunity to build positive relationships with staff	68.4
Opportunity to interact with peers	68.4
Increased motivation to use equipment in the MSE compared to the classroom	57.9
Increased engaged time with MSE equipment compared to the classroom	57.9
Reduction of self-stimulatory behavior while in the MSE	57.9
Opportunity to explore and build cognitive skills	52.6
Generally reducing challenging behavior outside the MSE	47.4
Increase in independence in activities	47.4
Opportunity to build trust	42.1
Generalization of skills from the classroom to the MSE and vice versa	42.1
Improving attention to tasks after a session	36.8
Reduction of self-stimulatory behavior after using the MSE	31.6
Other	10.5

Table 5 Percentage of schools ($N=19$) reporting problems or disadvantages in use of MSEs

Problem or disadvantage	%
Cost of maintaining equipment	63.2
Safety issues with power cords and electrical equipment	57.9
Keeping the room and equipment tidy	57.9
Difficulties supervising more active students within the MSE	57.9
Lack of staff planning for MSE sessions	31.6
Lack of active teaching by staff within the MSE	31.6
Other	26.3
Equipment with flashing lights may cause seizures in some students	15.8
Some students become distressed	10.5

Other Comments

The final question asked for other comments and these were offered by seven (36.8%) schools. Two schools noted the need for information on assessment and/or programming in the MSE. The remaining issues were raised by one school only: available space was inadequate; more MSEs were needed so students could have access multiple times a day; wrapping and deep tissue massage had been used effectively; the MSE was a wonderful resource for students to relax and explore. A further school raised three issues, the need for continued inservice training with staff turnover, limited availability of therapists to provide input on the MSE and the need for long term budget planning to support the MSE.

Discussion

Just over 50% of schools reported that they currently had a MSE installed. More than half of classes in these schools used the MSE and the room was accessed once or twice a week by most of these classes, although some used the room considerably more frequently. Most rooms had been established more than 5 years and the majority had undergone a major update. Taken together, these data suggest a high level of penetration into special schools in NSW.

Median expenditure on MSEs was \$24,000 and this was largely locally funded by schools, parents and donations to the schools. The low level of contribution from targeted government sources was interesting and may reflect a lack of conviction regarding the educational appropriateness of MSEs. In Australia, State governments take primary responsibility for delivery of school education and in this context, it was interesting that only one school reported access to targeted NSW state government funding. Given this, it is incongruous that around a third of schools reported that advice from itinerant support teachers or other Department of Education and Training personnel was a reason for establishing the MSE.

From the information provided, it appeared the policies, procedures and staff training were inconsistent across the schools examined. This is probably not

surprising as the NSW Department and Education and Training have no formal policies on MSE and special schools in NSW largely exist in a policy vacuum with regard to evidence-based instructional procedures. Specifically, the NSW Quality Teaching Model (New South Wales Department of Education and Training 2010) offers very little specific guidance for teachers working with students with high support needs.

There was a degree of consistency between the rationale for establishing MSEs and sources of information used. Schools reported relying extensively on advice and information from other schools and teachers. Information from journals and conferences was ranked much lower and no schools reported gaining information from university courses, suggesting that the practice is apparently not presented and/or endorsed in special education teacher education programs. Only 31.6% of schools reported research evidence about efficacy was a rationale for establishing MSEs. These findings are not unexpected in the context of research on sources of information used by teachers. Rudland and Kemp (2004) reported that teachers engaged in relatively little professional reading compared to other professions and the reading undertaken tended to be of a pragmatic nature. Further, Landrum et al. (2002) found that both regular and special education teachers valued the opinions of colleagues, workshops and in-service programs more than professional journals. Boardman et al. (2005) found that special educators reported that research evidence was not a major consideration in selection of instructional practices. In this context, the spread of practices with questionable efficacy, such as MSEs, is not unexpected.

Therapists (particularly occupational therapists) and equipment manufacturers were also prominent in responses to the questions addressing the rationale for establishing MSEs and sources of information. The involvement of occupational therapists is unsurprising given the extensive use of sensory integration therapy in the profession (Leong and Carter 2008). While sensory integrative therapy has a much more focused theoretical rationale and stimulation is reportedly highly individualized, a philosophical inclination toward MSEs might be expected given the shared underlying belief in the importance of sensory stimulation. The involvement of equipment suppliers is expected to some degree but the frequency with which they factored in school decision making is concerning. It may not be wise to rely heavily on commercial organizations who, by definition, are in the business of selling a product, to provide information relating to the educational benefits of that product, particularly given the limited access to research reported by the schools. These findings are broadly consistent with results reported by Stephenson and Carter (2011a) where advice from equipment suppliers was a factor in the decision-making of both schools and one school reported input from external support staff and therapists.

One distinction arising in some previous qualitative research has been in the approach taken to the implementation of MSEs. While certainly not incompatible, a divergence exists between the use of MSEs for undirected passive recreational purposes, more consistent with the original snoezelen philosophy, and more focused and directive educational purposes (Bozic 1997; Pagliano 1998; Stephenson and Carter 2011b). In a previous investigation of the use of MSEs in early adopting NSW special schools, Stephenson and Carter (2011a) reported a focus on

educational outcomes. The focus on educational outcomes, albeit ranging from undifferentiated to quite specific, appears to contrast with the purposes reported in the current study where providing a passive leisure activity was equal third ranked (89.5%) and providing the students with an enjoyable experience was equal first ranked (94.7%) among the reported functions. Further, lack of staff planning for MSE sessions and active teaching by staff within the MSE was only seen as a problem by about a third of schools. A focus on active skill teaching was not particularly evident in the responses, with the highest ranked purposes addressing the provision of sensory experience, enjoyment, leisure and behavior state (relaxing, calming). Only the latter three functions involve student outcomes and these can be technically difficult to measure, even in a research context. The lack of focus on specific direct active skill teaching is broadly consistent with the findings of Stephenson and Carter (2011b).

The highest rated benefit (sensory stimulation, 94.7%) did not describe a child outcome but, rather, an intervention strategy. This paralleled the equal highest rationale for implementing the MSE, the philosophical appeal of a multi-sensory approach (73.7%). Thus, despite the confused and weak theoretical rationale and equivocal empirical evidence for MSEs, it appears the assumption that provision of sensory stimulation is inherently beneficial, is well ingrained in the beliefs of the responding schools. More generally, a remarkably wide range of benefits of MSEs were reported, again with the next highest ranked items focusing on anxiety reduction and relaxation. The wide range of reported benefits is consistent with previous qualitative research in schools (Pagliano 1997; Stephenson and Carter 2011a; Stephenson and Carter 2011b), although these benefits have not been consistently confirmed in the research literature.

Interestingly, in the current research, opportunity to focus on tasks away from other distractions was relatively highly reported as a benefit (73.7%) but improving attention to tasks after a session received quite a low rating (36.8%). Two other responses addressed generalization of benefits outside the MSE. Reducing challenging behavior outside the MSE was seen as a benefit by 47.4% of respondents and reduction of self-stimulatory behavior after using the MSE by only 31.6%. Taken together, these results suggest that schools had similar reservations about generalization of behavior change from MSEs to those that have been expressed by reviewers of the research evidence.

Based on the current study and previous analyses (Bozic 1997; Pagliano 1997; Stephenson and Carter 2011a; Stephenson and Carter 2011b), it appears that MSEs can be perceived to provide a number of functions including providing passive leisure, providing generic stimulation that is viewed as generally beneficial and for the teaching of specific and targeted skills (such as communication). While MSEs in NSW are not primarily funded from government funds, they are used extensively in government schools, consume resources and instructional time. Thus, it would seem reasonable to expect the development of policy to govern their appropriate use. While the following policy recommendations are specific to the school system examined in this research, they may well have relevance to other systems where MSEs are being increasingly deployed.

One primary role of any policy should be to clarify acceptable educational uses of MSEs. Approximately, 70% of responding schools indicated that the MSE was not

used during lunch and recess breaks, suggesting that any recreational use was during scheduled class time. If the view is taken that passive recreation, outside normal recess and lunch breaks, is an acceptable educational use, this needs to be clearly articulated and the extent of appropriate use defined. Further, expressed concerns as to whether this form of recreation is appropriate and normalized (Ayer 1998; Cavet and Mount 1995) need to be explicitly addressed. A second view could be taken that sensory stimulation may be inherently beneficial across a wide range of educational outcomes. Given the absence of any plausible or empirically supported theoretical mechanism to explain such general outcomes, and the weak experimental evidence on MSEs, it could be argued that any policy should clearly articulate how these purported educational outcomes should be objectively monitored by schools. A similar recommendation would be relevant if MSEs are viewed as potentially beneficial for the teaching of specific and targeted skills. Such mandated monitoring might assist teachers to confirm or refute their subjective impressions of benefits of MSEs. Further, such a mindset may provide a starting point for the conduct of high quality research to definitively determine if MSEs have any meaningful effects on learning. While research support for MSEs is weak at best, only approximately a third of schools reported that research was a consideration in establishing their room and about a fifth reported accessing academic journals. Given these data, it would seem that the NSW Department of Education and Training has a clear and pressing responsibility to provide schools with access to this information so they can make fully informed decisions. More generally, the extent of use of MSEs suggests that the focus on evidenced-based practice in special education literature is not necessarily translated into practice by all educational bureaucracies.

Thus, in summary and given the absence of convincing empirical evidence for the efficacy of MSEs, policy recommendations fall into several broad areas. When MSEs are already in use, these recommendations include the need to define the extent of appropriate recreational use and to provide guidelines for the documentation of educational outcomes where these are anticipated. Perhaps most importantly, educational bureaucracies have a responsibility to provide guidance on the use of evidence-based practice in educational service delivery in general. More specifically, they need to provide accessible information on the research base underlying MSEs, such that schools can make informed decisions about the practices they employ. Obviously, at a more fundamental level this requires a genuine commitment by educational systems to the use of research evidence to guide instructional decision-making.

A number of limitations of the current study need to be addressed. The survey was directed, via the school Principal, to the representative who was most knowledgeable and best able to provide the requested information about the MSE and its use within the school. Nevertheless, data were presumably provided by only a single staff member and consequently, responses may reflect only their perspective. Further, Stephenson and Carter (2011b) reported that the views of individual teachers on the use and benefits of MSEs did not always completely accord with those of nominated school representatives. In addition, the study relied exclusively on teacher report about the use of MSEs and the extent to which this matches practice cannot be verified.

Conclusion

This research supports the claim that MSEs are increasingly being used in schools servicing students with severe disabilities. A primary justification for their use in the schools examined appears to be a belief in the inherent benefit of providing sensory stimulation, despite the absence of a plausible theoretical mechanism and weak supporting empirical evidence. It appears that schools rely on the views of other professionals and information from equipment suppliers in their decisions to install the rooms with very little examination of research. A wide range of uses and benefits are reported but those relating to specific skill teaching and acquisition tend to be lower ranked. Noting the extent of use of MSEs and the time and resources they consume, there is a clear need for policy guidelines for their appropriate use and evaluation in the school system.

References

- Australian Bureau of Statistics. (2009). Australian demographic statistics, Jun 2009. Retrieved January 20, 2010 from <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0>
- Ayer, S. (1998). Use of multi-sensory rooms for children with profound and multiple learning disabilities. *Journal of Learning Disabilities for Nursing, Health and Social Care*, 2, 89–97. doi:10.1177/146900479800200206.
- Boardman, A. G., Arguelles, M. E., Vaughn, S., Hughes, M. T., & Klingner, J. (2005). Special education teachers' views of research-based practices. *Journal of Special Education*, 39, 168–180. doi:10.1177/00224669050390030401.
- Botts, B. H., Hershfeldt, P. A., & Christensen-Sandfort, R. J. (2008). Snoezelen: empirical review of product representation. *Focus on Autism and Other Developmental Disabilities*, 23, 138–147. doi:10.1177/1088357608318949.
- Bozic, N. (1997). Constructing the room: multi-sensory 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: Chapman & Hall.
- FlagHouse. (2010a). Meet SNOEZELEN customers. Retrieved June 21, 2010 from <http://www.flaghouse.com/westgate.asp>
- FlagHouse. (2010b). SNOEZELEN In North America. Retrieved June 21, 2010 from http://www.flaghouse.com/Going-Strong-northamerica_AL02.asp#Title
- Fowler, S. A. (2008). *Multisensory rooms and environments*. Philadelphia: Jessica Kingsley.
- Gallaher, M., & Balson, M. (1994). Snoezelen in education. In R. Hutchinson & J. Kewin (Eds.), *Sensations and disability* (pp. 129–137). Chesterfield: Rompa.
- 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. doi:10.1016/S0891-4222(01)00077-4.
- Hyatt, K. J., Stephenson, J., & Carter, M. (2009). A review of three controversial educational practices: perceptual motor programs, sensory integration, and tinted lenses. *Education and Treatment of Children*, 32, 313–342. doi:10.1353/etc.0.0054.
- 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. doi:10.1080/09638280110074911.
- Landrum, T. J., Cook, B. G., Tankersley, M., & Fitzgerald, S. (2002). Teacher perceptions of the trustworthiness, usability, and accessibility of information from different sources. *Remedial and Special Education*, 23, 42–48. doi:10.1177/074193250202300106.

- Leong, H. M., & Carter, M. (2008). Research on the efficacy of sensory integration therapy: past, present and future. *Australasian Journal of Special Education*, 32, 83–99. doi:10.1080/10300110701842653.
- Lotan, M., & Gold, C. (2009). Meta-analysis of the effectiveness of individual intervention in the controlled multisensory environment (Snoezelen) for individuals with intellectual disability. *Journal of Intellectual and Developmental Disability*, 34, 207–215. doi:10.1080/13668250903080106.
- Lotan, M., & Shapiro, M. (2005). Management of young children with Rett disorder in the controlled multi-sensory (Snoezelen) environment. *Brain & Development*, 27, S88–S94. doi:10.1016/j.braindev.2005.03.021.
- Martin, N. T., Gaffan, E. A., & Williams, T. (1998). Behavioural effects of long-term multi-sensory stimulation. *British Journal of Clinical Psychology*, 37, 69–82.
- McKee, S. A., Harris, G. T., Rice, M. E., & Silk, L. (2007). Effects of a Snoezelen room on the behavior of three autistic clients. *Research in Developmental Disabilities*, 28, 304–316. doi:10.1016/j.ridd.2006.04.001.
- 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. doi:10.1111/j.1467-8578.1995.tb01322.x.
- New South Wales Department of Education and Training. (2009). Statistical Bulletin: Schools and Students in New South Wales, 2008. Retrieved January 20, 2010 from https://www.det.nsw.edu.au/media/downloads/reports_stats/stats/bulletin/stat2008.pdf
- New South Wales Department of Education and Training. (2010). NSW Quality Teaching Model. Retrieved February 19, 2010 from <http://www.curriculumsupport.education.nsw.gov.au/qualityteach/index.htm>
- Graduate Opportunities (n.d.). NSW Department of Education & Training (teach.NSW). Retrieved August 31, 2010 from http://www.graduateopportunities.com/employer/profile/112/Company_Profile
- 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: Centre for Social Welfare Research, James Cook University.
- Pagliano, P. (1998). The multi-sensory environment: an open-minded space. *British Journal of Visual Impairment*, 16, 105–109. doi:10.1177/026461969801600305.
- Pagliano, P. (2006). The multisensory environment: providing a feeling of emotional closeness. *Journal of the South Pacific Educators in Vision Impairment*, 3, 23–25.
- Rudland, N., & Kemp, C. (2004). The professional reading habits of teachers: implications for student learning. *Australasian Journal of Special Education*, 28, 4–17. doi:10.1080/1030011040280102.
- Schofield, P., & Davis, B. (1998). Sensory deprivation and chronic pain: a review of the literature. *Disability and Rehabilitation*, 20, 357–366. doi:10.3109/09638289809166094.
- 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.
- Stadele, N. D., & Malaney, L. A. (2001). The effects of a multi-sensory environment on negative behavior and functional performance on individuals with autism. *UW-La Crosse Journal of Undergraduate Research*, 4, 211–218.
- Stephenson, J. (2002). Characterization of multisensory environments: why do teachers use them? *Journal of Applied Research in Intellectual Disabilities*, 15, 73–90. doi:10.1046/j.13602322.2002.00102.x.
- Stephenson, J., & Carter, M. (2011a). The use of multisensory environments in schools for students with severe disabilities: perceptions from schools. *Education and Training in Autism and Developmental Disabilities*, 46, 276–290.
- Stephenson, J., & Carter, M. (2011b). The use of multisensory environments in schools for students with severe disabilities: perceptions from teachers. *Journal of Developmental and Physical Disabilities*, 23, 339–357. doi:10.1007/s10882-011-9232-6.