

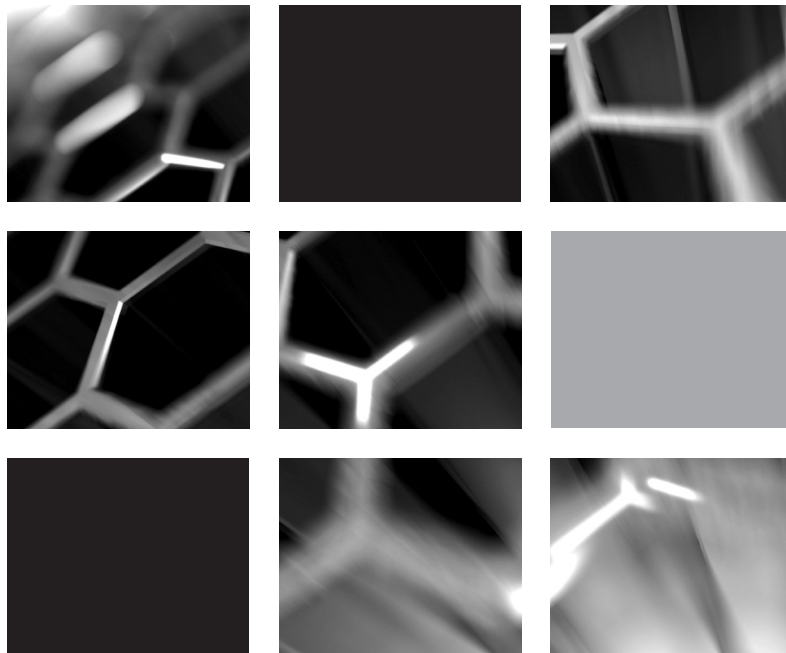


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# An evaluation of a swimming toolkit for children on the autism spectrum

**Julie Earl, Birmingham, UK**

## Editorial comment

Julie Earl is a qualified Swimming Instructor and has a daughter with autism. She recently completed her BPhil degree in autism at the University of Birmingham. For her final dissertation, she evaluated a toolkit that she developed for swimming instructors and teaching staff. This paper summarises the work that Julie did. As she points out, there is relatively little written generally on sport and autism and few resources specific to swimming. As swimming is an activity that many children enjoy and has recognised benefits for both physical and mental well-being, it is important that children on the autism spectrum have a good introduction to swimming so that they can participate successfully in lessons, have fun with their families and enjoy it in later adulthood. This paper should enhance practice in this area and further details on the toolkit can be obtained from the author.

## Address for correspondence

### Email

JDE100568@aol.com

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## Introduction

Swimming has been part of my life for as long as I can remember. I swam competitively for many years, qualifying as a swimming instructor as soon as I was old enough. My interest in autism started when I had an autistic child of my own. Trying to access swimming lessons for her was difficult and when I did access them, the swimming teacher knew nothing about autism or the difficulties faced by these children. After many attempts at lessons, always ending in disaster, I started to teach her to swim myself. I found she swam in the most peculiar way (under water all the time), did not follow conventional instructions, or meet the normal progression you would expect for a child. I am not saying she did not learn or make progress, but it did not follow the pattern of other children I had taught. Swimming was an activity she loved. It provided her with almost an inner peace. My daughter was what many experts call "the child from hell". The screaming stopped when we entered the swimming pool environment and for the hour following swimming. At the time I did not know about autism, as at that point my daughter did not have a diagnosis. I did not understand the significance of why she would then be quiet and settled and almost happy for this short period of time. We spent a lot of time at the swimming pool when she was young and even

now when she is finding life difficult, the first thing she will ask to do, is to go swimming. She describes the sensation of being in the water as if she is "free".

The development of the swimming toolkit came about when a swimming instructor asked me about autism. A child with autism had just joined her swimming class and she was struggling to find a way to engage with him. I already knew there was little information about swimming and autism, as I had done my own research when I started to teach my own child. Although there was a lot about many other conditions and disabilities, Pan and Frey (2006) found there was relatively little information regarding physical activity and individuals on the autism spectrum. So, I set about designing a swimming toolkit that swimming staff and educators could use to enable them to understand children with autism they were trying to teach.

The main aim of my study was to evaluate whether the swimming toolkit I developed met the needs of educators and swimming staff to enable more children with autism to access swimming and to enjoy swimming lessons. Jordan (1999) argues that much academic research on autism does not directly improve the life and conditions of people on the autism spectrum. My goal

was to provide tools and understanding to help children with autism experience success at swimming.

## Review of the literature

### *Benefits of swimming*

There has been very little research into swimming and autism. Swimming is a skill which should be made available to all, including those with autism. O'Connor (2006) reminds us that for years, children with autism were left on the sidelines, a consequence of a widespread belief that they were incapable of participation in athletics. We are reminded on a daily basis that we all need to do exercise to remain fit and healthy. Why should it be any different because the child has autism? The effects of exercise can improve mental and physical well-being. Swimming is felt to be a sport ideally suited to most individuals on the autism spectrum. Attwood (1998) suggests that the ability to swim appears least affected, and this activity can be encouraged to enable the child to experience genuine competence and admiration for proficiency with movement.

However, despite the potential benefits, individuals with autism often miss the opportunity to swim. Is it that they do not want to take part? Or is it that because appropriate teaching methods have not been used? In my own experience, my daughter is now an excellent swimmer, quick, fluid and graceful when in water. Is that because she was taught on a one-to-one basis or would she have managed in a class environment with different teaching methods? These are the questions I set about trying to research.

### *Sensory issues and swimming*

Bogdashina (2003) states that everything we know about the world and ourselves comes through our senses. The senses of sight, sound, taste, smell and touch are what we use on a daily basis to register information. Swimming is an activity which can bombard the senses. It may be the bright lights, reflections off the water or the smell of the chlorine that distresses a child or may attract them. Sensory overload can cause an individual to have sensory agnosia (ie they are unable to filter out or interpret the sensory stimuli). Donna Williams (1999), an adult with autism, labels these experiences '*meaning-blind/meaning-deaf/touch-dead*'. She compares the condition with being deaf-blind, the main difference being, the blind get meaning without seeing, whilst the meaning-blind see without meaning. The deaf-blind may have lost their

sense but the meaning-blind/deaf have lost the meaning (Williams, 1998). Bogdashina (2003) argues that when sensory input becomes too intense, a child learns to shut off his sensory channel and withdraw. Gay Eastoe (2005), an able adult with Asperger syndrome, explains her feelings in the swimming pool if there are lots of people in it.

*"If the pool is particularly busy my body feels wobbly and weak and I start to disassociate from my surroundings. My legs start to feel heavy and my body hurts all over, and I become slower, and my swimming becomes un-coordinated. When I stop at the end of the pool my speech is slurred and incoherent."*

I have seen a child with autism react like this at the swimming baths. However, this was not during a swimming lesson, but in free time, where they appeared to be totally lost. They appeared not to hear me or to see me. Clements (2005) explains that unstructured times can be noisy and chaotic, and if the individual cannot fix his mind on something specific, then he becomes wide open to all the stimulation around and gets overwhelmed and distressed.

What makes the matter even more complicated is that no two autistic people appear to have exactly the same pattern of sensory perceptual experiences (Bogdashina, 2003). For a swimming teacher, knowing each individual's sensory sensitivities can be the key to teaching autistic individuals to swim.

Although swimming can bombard the autistic child with sensory information, once they are in the water, it seems to have the effect of producing a feeling of relaxation and calms the child. However, this may only happen when they have overcome the sensory sensitivities around the pool area, such as the texture of the pool floor, the lighting, and changing rooms, for example. When an individual enters the water, their body becomes subject to hydrostatic pressure. The deeper an individual goes into the water, the greater the pressure. The effect of the pressure of the water seems to work like Temple Grandin's squeeze machine. Temple Grandin, a very able woman with autism, describes how she,

*"... always hated to be hugged, I wanted the experience but it was just too overwhelming."* (Grandin, 2006)

She goes on to explain that she craved the sensation of pressure. After a visit to her aunt's ranch in Arizona, she came up with the idea of building a squeeze machine, similar to those used to hold cattle whilst being given injections. She noticed that some of the animals relaxed when squeezed between the side panels. Once built and the next time her anxiety and panic became overwhelming, she asked her aunt to help to position her within the machine. Although for the first few moments she felt panicky, this soon changed to a wave of relaxation. For about an hour afterwards she felt very calm and serene. Her constant anxiety had diminished. She explains after being in her squeeze machine for the first time it was the first time she felt comfortable in her own skin. My own daughter and other autistic children I have taught in the past, all describe a similar feeling after being submerged within the swimming pool. Bogdashina (2003) states that when the nervous system becomes desensitized through gradual and slow stimulation, the experience of touch can become pleasurable. Although the swimming pool does not provide an intense pressure, it does allow the body to be cocooned in a warm mass of water, allowing autistic individuals to reduce anxiety, allowing them to feel relaxed and calmer and it also reduces the hyper arousal of their nervous system.

Swimming can be used as part of a programme to help improve the development of the vestibular (body awareness) and proprioception (balance) systems. Individuals with vestibular hypersensitivity tend to have low tolerance to activities that involve movement (Myles et al, 2000). Individuals may also have problems with changing direction quickly and in being able to maintain a body position if their feet are not on the floor. These individuals are termed '*gravitationally insecure*' (Ayes, 1979) due to the fact that they fear their feet leaving the ground. Individuals who are vestibular hyposensitive may experience difficulties with understanding where their body is in space and may bang into people and things. They tend to be clumsy and are unable to stop and start an activity quickly. Swimming allows the body to be surrounded in a warm mass of water with gravity taking the weight of the body, allowing their body to float and to develop self awareness in a safe environment, with no right or wrong way of doing something.

Lianne Holliday Willey (1999), an able adult with autism said:

*'I could swim for hours, so long as I was moving both arms and legs together. But I suffered miserably when a stroke required me to use bilateral coordination and balance.'*

Myles et al (2000) state that the proprioception system allows the muscles and joints to send messages to help us move, sit, hold items and balance. Difficulties with this system may mean that the autistic child may have poor posture, may be confused by their right or left, movements may be clumsy and may appear to have little or no energy. Individuals who have difficulties with these areas tend to have difficulties focusing and live in a heightened state of arousal. These children live in their "fight and flight" sympathetic nervous system just to survive each day (Johnson, 2006). Swimming allows the body to become immersed and surrounded by hydrostatic pressure as well as the forces of gravity, to enable the body to feel enclosed and less removed from stability. The feeling of the water around the body can provide the feeling of serenity and calm to allow the body some relaxation time, whether the individual with autism is swimming or just moving their body in the water.

### **Positive physical and mental health benefits of swimming**

Regular swimming provides many long-term benefits and helps with physical fitness and well-being. Physical activity is important for children with and without disabilities alike, as it promotes a healthy lifestyle, but it can help individuals with autism in unique ways. It is commonly documented that individuals with a diagnosis on the autism spectrum can suffer with anxiety and depression. Patrick (2008) suggests regular and rigorous exercise can lead to more restful sleep and can reduce symptoms of anxiety and depression. Not only does swimming seem to have a calming effect on individuals with autism, it has also been shown to produce positive results in stopping repetitive behaviours, albeit for a short amount of time.

### **British swimming**

Individuals with autism are now eligible to swim for their country in the Special Olympics. British Swimming has produced a development plan (Disability Development Plan 2002–2006). A series of objectives to facilitate the mainstreaming of disability swimming are included within the plan and these are focused, in particular, on the alleged need to:

*'... improve competitive opportunities, talent identification, opportunities for coaches, teachers and officials, club structures, and the promotion of disability swimming.'* (Amateur Swimming Association, 2002, p 62)

What seems to have been omitted in this are the grass roots of the sport. How do our children and young adults get to learn to swim?? To produce Olympic swimmers we first need to teach them how to swim!

In reading about methods of teaching children with autism, they were sometimes described in very negative terms and criticised. For example, that they cannot establish a bond with a group; they lack concern for others, are manipulative, or exhibit aggressive behaviours and these disorders interfere with a positive learning climate and may decrease the amount of learning that all participants achieve. My perspective is that they should not be criticised in this way, but be supported. As Clements (2005) argues, individuals with autism should not be seen as damaged goods, but as people with a different point of view and a different set of priorities. People with autism are not travellers from some other world. They are fellow travellers in this world, on the journey of life, like the rest of us, their route and their destination may be individual, reflecting each person's unique qualities and unique circumstances (Clements, 2005). They may not learn in the 'normal' way, so we need teaching structures changed to meet their needs.

### **Progression in swimming**

Wing (1996) maintains that children with autism typically have an unusual learning curve. Instead of making steady progress, they tend to learn something and then stick at this point for a long time. Then, whenever everyone has given up hope, they suddenly take a step forward. Swimming is an ideal sport for children with autism as it is taught in a sequential way. Each small step can be a success for an individual. Methods of teaching and ways of communicating success have to be tailored to the child's level of understanding and ability to perform a skill. Swimming teachers need to ask the question, how does the individual you are teaching learn? Clements (2005) explains that for many people with autism, even those with good speech, visual processing is better than auditory processing or is a preferred medium because it involves less social pressure, less sequential processing and is less

dependent on speed. Producing visual forms of communication for swimming, such as visual timetables, picture cards and social stories should make it easier for them to understand and learn at their own pace and style. Many people are totally baffled by autistic symbols, but to an autistic person they may provide the only tangible reality or understanding of the world (Grandin, 2006).

### **The swimming toolkit**

In designing the toolkit, I tried to take into account all that I knew about autism and about swimming and thought about the information that instructors would need. Included within the toolkit are the following:

- What is autism?
- "Autism is" (A poem by Wendy Lawson, 2006)
- How to help a child with autism in the swimming pool
- How does a child with autism benefit from swimming sessions?
- Ideas to prevent challenging behaviour
- Sensory profile questionnaire – Ideas to help with sensory difficulties within the swimming pool environment.
- Visual strategies – swimming changing dolls, visual timetable, visual cues, a story about swimming, going swimming, traffic light cards, certificates

The toolkit was set out in such a way as to make it bright and appealing, and it was targeted at individuals with little knowledge of autism.

### **Evaluation methods**

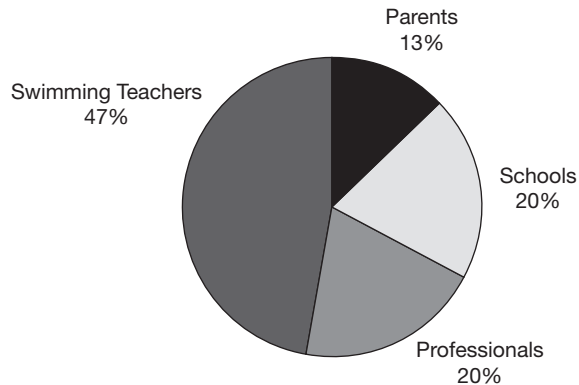
#### *Questionnaires*

I produced a questionnaire to accompany the swimming toolkit, which I sent out to swimming instructors, and to teachers who were involved with swimming. I also included other autism professionals to get a slightly different perspective, but still using the same questionnaire. Thirty questionnaires were sent out in total (see *Figure 1*).

#### *Observation of swimming teachers*

I conducted observations of three swimming instructors using the toolkit, to look at the effectiveness and usefulness of the information provided within it and to observe the engagement of the autistic children.

**Figure 1:** Type and number of respondents to whom the questionnaire was sent out (n=30)



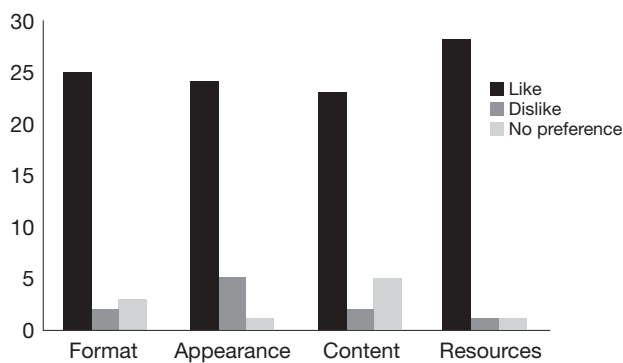
*Interviews with parents*

While at the swimming pools, after the observations, I spent time interviewing some of the parents of children that had been in the swimming classes, to see if their child had benefited from the different methods of teaching. I found the parents were keen to talk to me. I wanted to gain their views on what they felt the toolkit had done to improve their own child’s experience of swimming.

**Findings**

All 30 questionnaires sent out were returned to me which was an excellent response rate. Overall, the toolkit was well received, and relatively minor changes were suggested. The most positive comments related to the visual cues and visual resources provided within the toolkit. This may be due to the fact that there are to my knowledge, no other similar tools on the market at the moment, specifically for swimming. *Figure 2* shows what the respondents felt about the format, appearance, contents and resources within the toolkit.

**Figure 2:** How was the toolkit viewed by the respondents?



*Use of visual cues and tools*

One suggested using an action man doll to help show a three-dimensional image to the child, rather than using words or pictures which can seem confusing. They had used an action man doll to show the required action of the head, arms and legs. Because you can move each part separately, the child/adult would be able to follow the sequential order.

*Visual timetable*

Some were not sure how to use a visual timetable as it was the first time they had seen one. One respondent felt that it was fiddly to use, and did not understand why it would be needed, despite the fact that on page 5 of the toolkit, it explained the need to teach in a more visual way.

*Changing dolls*

The changing dolls included within the toolkit had a very mixed response from the participants. One of the comments received said the changing dolls were too babyish and would not be useful for older children. Others felt they would be a great resource and were well thought out. In my search for suitable resources, there seemed to be many products on the market which can be used to help autistic children understand the concept of changing clothes, but very few that can be adapted for swimming.

*Social stories*

The sample story is intended to be changed to meet the needs of the child. A copy of this story is given in *Appendix 1*. Some respondents felt that I had not fully explained how to use the story, or indeed what it might be used for. Others felt it would be hard to adapt. This I can understand if you do not work with autistic children on a daily basis. The story was produced to provide information on where the child would be going swimming, the sequence of events at the pool, what equipment the child might be required to use and how they might be feeling whilst taking part in their lesson. Many liked the fact that a sample was included so they could adapt it themselves without having to write their own story.

*Certificates*

The certificates included in the toolkit received some of the most positive comments. All but one respondent felt they were a great resource. Respondents felt they could be used to underpin both the Amateur Swimming



Association (ASA) and Swimming Teachers Association (STA) swimming scheme. As it often takes children quite a long time to achieve the usual swimming awards given by the ASA and other bodies, the toolkit certificates were welcomed, as staff could mark a child's success with smaller steps with these.

The certificates can be used as a standalone reward for great swimming that day. One said, "*They are instant success recognition.*" Mark Fleisher (2006), a very able adult with autism, explains that the rewards of doing well give a sense of satisfaction and intense pride. One respondent suggested adapting the certificate to be more personalised and to start with the words "I can"..... (blow bubbles).

#### *Traffic Light Cards*

The traffic light cards were positively received. The benefits of these have been shown in other studies. The cards are clear visual markers as to when an action will start (green) and stop (red) – and when it is about to start or end (orange).

#### *Sensory Profile*

I felt that the sensory profile was a vital part of the toolkit, to provide key information on understanding sensory issues related to swimming. Twelve out of the 14 swimming teachers did not see the purpose or understand the potential benefits of the profile which highlights the need to train instructors in the rationale and use of the toolkit. The school teachers and parents all felt the sensory questionnaire was a fantastic idea and that it provided great information to the swimming teacher on areas of difficulty.

#### *Knowledge of autism*

Those who knew little or nothing about autism reacted in a positive way and said they had increased their knowledge about autism. I was also encouraged by the fact that four of the six teachers felt that they had learnt new ideas and skills which they would put into practice within their own schools. Prior to receiving the toolkit, one felt that her knowledge of autism was very good but the toolkit reminded her that you continue to learn all the time and that you need to keep an open mind to trying new skills and ideas.

## **Observations on the use of the toolkit in practice**

I carried out observations on three swimming instructors using the toolkit with a child with autism at the pool. Each teacher had a very different style of teaching and method of delivering the lesson.

#### *Teacher 1*

Teacher 1 had a well thought out lesson, with clear and precise instructions and kept all verbal communication to a minimum. She backed all her teaching up with the use of visual cues and had the visual timetable enlarged to A3 size for the children to see. Before teaching the young boy in question, she had made contact with his mother to discuss his needs. She did not distinguish between the autistic child and the other children within the group. The child seemed to enjoy the lesson and was making progress, just a little slower than his peers. The only time he seemed to become unfocused was during free time. The teacher explained he did not enjoy jumping in like the other children as he was not comfortable with the splashing and noise. She would often give him a hoop to pick up from within the pool instead during this time.

#### *Teacher 2*

Teacher 2 had a well planned lesson. She was clear and precise, giving good demonstrations, but did not use any of the visual resources in the toolkit. When asked why not, she answered, "*I did not have a laminator to make the cards waterproof and I felt they were too small.*" The teacher had spoken to the child's mother after the first lesson, as the child had been challenging. The child took part in all the activities and he seemed to enjoy his time in the water. He lacked focus from time to time and spent time twizzling and flapping. The teacher had a clear set of rules for the whole class, but these were given in verbal form only. During unstructured time, the child seemed isolated from the other children and kept trying to climb out of the pool, whilst shouting at the teacher. In defence of this teacher, she had read the toolkit and had spent time talking to his mother, all of which she had done in her own time.

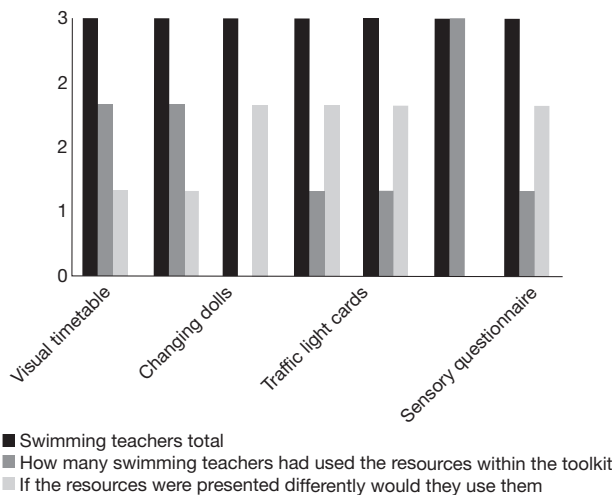
#### *Teacher 3*

Teacher 3 had a well-planned lesson and a quiet but clear voice. She had been given the child with autism as nobody else had been able to teach him. She had a clear set of rules displayed on the wall and the visual timetable enlarged to A3 size. The visual cues had also

been enlarged by the teacher to use as standalone cards whilst teaching. She had made contact with his mother before he started within her lesson and she had explained many of her son’s difficulties. Both his mother and the swimming teacher had between them adapted the story, as his mum had used stories before, with great success. His mother and the teacher had also gone through the sensory questionnaire to find out which areas the child would find most challenging. Once the child was in the water, you could not have picked him out from the other children. The teacher used very few verbal commands, instead using clear demonstrations and visual cues to explain what she wanted each child to do. She used a coloured float scheme to set the children off and used the traffic light system as a means of explaining when an activity was going to finish and a new one was about to start. The teacher’s finishing activity was very calm and all the children took part. She had decided to do star floats, and the children were not given free time. The teacher explained that it had taken some time for the child with autism to settle down and to take part in all activities and she felt she had made real progress with her own understanding of autism after receiving the toolkit. The visual cues and visual timetable had been the key to success, but she also said that all of the children had benefited from being taught in a very visual way. All the children had made progress with their stroke technique, where as she would normally have a few children still struggling after a term’s swimming lessons.

Figure 3 shows which resources from the toolkit were used during the observations.

**Figure 3:** Resources used by swimming teachers during the observations



The three teachers observed all reported that the toolkit had provided a useful tool to help them with the teaching of autistic individuals. They also felt that it would help other teachers with professional development and that it could be used for all pupils, not just those with autism.

**Views of the parents**

All parents felt that the lessons were greatly improved as a result of the toolkit. Their children were much happier and they felt that this was due to the teachers improved understanding of their child. Children were not continually being told off by the teacher for not making eye contact and for losing focus during unstructured times. The other improvement was the fact that swimming teachers were using a more planned and formal lesson format. They were using clearer, calmer voices and were keeping verbal commands to a minimum. For all the parents, the introduction of the certificates had made a huge difference. One mother told me that her son came to find her with his certificate and even though his communication was limited, the look on his face told her just how he felt. He took the certificate everywhere with him. His mother said he had never been given a certificate for achieving any success within sport before and that this was a huge achievement for him.

I asked all parents if they would change anything about the toolkit. They commented that the story needed more explanation. Although they knew how to use such stories, two of the parents had never adapted these to meet their child’s needs. They had always been given stories from the school. Parents also felt that more training should be in place to help swimming teachers understand the difficulties faced by an autistic child as well as for other disabilities. All of the parents felt the toolkit was a success.

**Concluding comments**

Overall, the toolkit was very well received and was a success, but some changes were suggested. One of the teachers made a fantastic point, *“It shows good practice and reinforces the need to adapt for all”*. All the swimming teachers who received the toolkit felt that it was a great tool to help them with their professional development and it had given the basic knowledge of what autism is and some strategies to help children with autism. A key area I did not address when evaluating the toolkit, was in consulting autistic individuals themselves to see if what I had produced would help them when



going swimming or could have been used in the past to help them feel more accepted and part of a swimming group. Future research in this area should include people with autism.

I learnt so much from the observation of the toolkit in action and thank the teachers involved. Not one of the three teachers used it in the same way. If I had more time I would have made more observations. The observations did show that the toolkit could be used alongside other teaching styles and methods with scope to use it for all the children within the group, and not just the autistic child. If I had had more time, I would definitely have done more observations and gone back and re-observed the same swimming teachers another time to provide a greater knowledge of how the toolkit actually worked.

By interviewing parents, I gained more inside knowledge of how they see and would like to see swimming adapted to meet the needs of their own children. Although I am a parent myself with an autistic daughter, they suggested strategies I had not thought of. They felt that more training should be given to swimming teachers and that the toolkit was a great start.

To make the toolkit more accessible, I feel the areas below need to be addressed:

- *Sensory questionnaire to be made less complicated* – it needs to contain more information about why sensory sensitivities are a key area to be addressed when going swimming and presented in a simplistic form
- *Changing dolls* – further explanation of what the dolls are designed to do and lamination of the main body of the doll for ease of use
- *Visual timetable* – clearer and more in depth explanation on how a visual timetable works; look at providing it in laminated form and in an A3 format for ease of use
- *Visual cues* – provide laminated cues and in a larger size for ease of use

Additional ideas suggested, such as the action man doll and the provision of an index at the back of the toolkit could be incorporated. I am also looking at providing the resource as a web-based tool to be used like a library of resources, making it as accessible as possible. My hope is that more individuals with autism will be able to access

swimming in a public pool, the same as everybody else. The Sports Councils policy (1993) is to:

*“... ensure equality of opportunity for people with a disability to take part in sport and recreation at the level of their choice.”* (Sports Council, p 7)

This is what the toolkit’s aim is and let’s hope in the future that swimming can be available to all.

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**Appendix 1: A story about going swimming.**

This can be changed to suit the situation you want to work on. Pictures or symbols could be added. You can illustrate it with the child's favourite things.

My name is \_\_\_\_\_. I really like \_\_\_\_\_.

On \_\_\_\_\_ (Day of the week), I usually go swimming.

I usually go to the swimming pool by (Coach, Minibus, Car) \_\_\_\_\_.

Most times when I get to the swimming pool, I go to the \_\_\_\_\_ (Male/Female) changing rooms.

In the changing rooms I usually get changed into our swimming costume and I put my clothes in a \_\_\_\_\_ (Bag, Box, Locker).

I then wait until the rest of our group have got changed.

I wait until our Teacher, \_\_\_\_\_, tells us to go onto the side of the swimming pool.

I will usually then walk onto the side of the swimming pool and wait for my (Swimming Instructor/Teacher), \_\_\_\_\_, to tell us what to do.

I may be asked to put on some equipment (Arm Bands, Noodles, Floats, Belt, Life Jacket) to help me swim.



My (Swimming Instructor/Teacher) will usually tell me when I can enter the water and how I should enter the water safely.

When my (Swimming Instructor/Teacher) is telling me what to do I need to look and listen, so I know what to do.

My teacher will be pleased and I may get a reward certificate.

During swimming I may be asked to do lots of different things which may be fun.

An evaluation of a swimming toolkit for children on the autistic spectrum



When the (teacher/instructor) lets me know it is time to get out, I need to find the nearest place to either climb out or exit the swimming pool safely.

Then I will usually walk back to the changing room.

I may be asked to have a shower.

Then I usually get dry and get dressed and wait for the rest of our group quietly.

I then go back to (School/Home) by (MiniBus, Coach, Car).