

# A Case Study Investigating the Potential Impact of Video Modelling on the Teaching of a Student with Autism

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## **Abstract**

Video modelling involves a student observing a video of a person carrying out a desired behaviour and the student subsequently imitating this behaviour. It can be used to demonstrate and teach certain skills to students with autism. The objective of this research study was to examine the potential impact of video modelling on the teaching of a student with autism. Specifically it explored whether video modelling could be used to teach a baking skill.

The research was conducted using a single subject case study to determine if the participating student learned a baking task using video modelling as an intervention over a five month period. The study was divided into 4 phases where data was collected on the number of tasks independently completed.

- Baseline Phase – the existing level of student performance was measured
- Intervention Phase – the level of student performance after the video modelling intervention was measured
- Generalisation Phase – the level of student performance in a different setting to where the learning took place was measured
- Maintenance Phase – the ability to perform a task over time without re-teaching was measured

Data collected in the study found that the student acquired the baking skill with 100% independence following the video modelling intervention. These findings suggest that video modelling was a successful technique for teaching the participating student the baking skill.

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# **Chapter 1 – Introduction**

## **1.1 Background**

People learn in a variety of ways. They learn when they hear, when they see and when they experience something first hand. Often people prefer one method of learning over the others and try to use that method whenever possible. Although we may favour one method over another, most of us find all three ways of learning helpful. Students with autism also learn in a variety of ways. But research has shown that for many students with autism spectrum disorders when they are given opportunities to learn with visual cues they excel (Schopler et al., 1995). Students with autism are visual learners. They think in images not words. Their primary language is pictorial not verbal.

## **1.2 Research Question**

In order to address the broad research aim outlined above it was necessary to focus on a more specific research question. The question selected for investigation in this study is:

The potential impact of video modelling on the teaching and learning of a student with autism.

## **1.3 Rationale**

The author is a secondary school teacher. For the past three years the author has worked with students with autism. The students attend mainstream classes but often find it difficult to learn in these classes due to the lack of visual aids used by teachers. One of the students with autism has shown particular interest in the subject home economics.

He enjoys the subject and likes to take part in the practical cookery class which take place weekly. It was decided that the student would sit the home economics Junior Certificate Exam. Part of the exam requires the student to sit a practical exam. While the student appeared to enjoy taking part in the cookery class it was noted that he continuously needed to be told what to do and how to do it. It seemed he had not learned any of the skills in the kitchen even though he was doing them weekly eg. sieving flour, rolling pastry, mixing ingredients, wiping down tables or washing and drying dishes.

Students with autism present a unique set of challenges to caregivers and teachers. Consequently identifying effective educational interventions for this population is a critical task for researchers and practitioners. Consistent with Bandura's (1969) social learning theory, video modelling is a versatile intervention that capitalises on the potency of observational learning and is well suited to address the educational needs of students with autism. Video modelling interventions involve a student watching videotapes of positive examples of adults, peers, or him- or herself engaging in a behaviour that is being taught (Haring, Kennedy, Adams, and Pitts-Conway, 1987). Videotapes are individualised for the student and may be created for a wide array of skills (e.g., social, communication, functional) and in a variety of settings (e.g., home, school, community).

## **1.4 Aims and Objectives**

This research project aims to examine the potential impact of video modelling on the teaching of a student with autism. The objective of this is that the student will be able to complete the home economics practical in the Junior Certificate examination. It is hoped that the objective will be achieved using a single-subject case study. Professionals working with students with autism prefer to use single subject designs (Wolery and Dunlap, 2001). Single subject designs provide structures for evaluating the performance of individuals rather than groups.

## **1.5 Research Methodology**

For this research project a case study was deemed the most appropriate research method. Case studies focus on evaluation elements or intervention elements from which deductive conclusions may be drawn for intervention or changes in intervention methods. This research method involves a great deal of observation and careful study of the presenting condition viewed within whatever context is deemed appropriate. In the case of this research project the student is observed baking scones. For every task he can complete independently it is recorded. The data will be collected using AB design.

The AB Design is a teaching design. The AB design is the basic single-subject design. The designation AB refers to two phases of the design: the A, or baseline phase, and the B, or intervention phase. During the A phase; baseline data is collected and recorded. A is the baseline observation period or the evaluation of current level of performance. For this research project a student will be observed making scones using written instructions. This will result in the collection of the baseline data. Once a stable baseline has been established, the intervention is introduced, and the B phase begins. The intervention often attempts to improve or maximise the current level of performance through theory-based methods. In this phase, intervention data is collected and recorded. The intervention for this research project is video modelling. The student will watch a DVD of a peer baking scones. Following watching the DVD the student will be required to bake scones. The researcher can evaluate increases or decreases in the amount of the target behaviour during the intervention phase and compare them with the baseline phase. Using this information to make inferences about the effectiveness of the intervention, the researcher can make decisions about continuing, changing or discarding the intervention.

Following the intervention phase the student will be observed to see if the skill he has learned generalises to other environments – Generalisation. The student will be observed baking scones at home. A month following acquisition of the skill the student will be observed baking scones to see if the skill has been maintained – Maintenance.

Throughout the observation of the student data will be collected on a data sheet. This data will be transferred to Microsoft Excel and the results will be graphed.

## **1.6 Scope and Limitations**

The rationale for this study suggested a naturalistic research paradigm and a single subject case study model was chosen to situate the research in a normal educational setting. The setting for this study took place in the home economics room in the school. A case study is ‘the study of an instance in action’ (Adelman et al., 1980). Its findings pertain to the particular case, and generalisations cannot be based on them although ‘they can provide insights into other similar situations and cases’ (Nisbet and Watt, 1984). This delimitation is consciously chosen in order to conduct a piece of research to which other practitioners can relate. The study has a number of limitations as well. This was a case study done on one student so findings must be interpreted with caution. The reason for using a single subject design is because professionals working with students with autism prefer these types of studies as they provide structures for evaluating the performance of individuals rather than groups (Wolery and Dunlap, 2001).

‘Single subject research has proven particularly relevant for defining educational practices at the level of the individual learner. Educators building individualised educational and support plans have benefitted from the systematic form of experimental analysis single subject research permits.’ (Dunlap and Kern, 1997)

It should be noted that the author is the class teacher in this instance and that she has designed and recorded the data in the study. While she strove to be objective throughout the study, these factors must be considered limitations of the study.

## **1.7 Overview of the Thesis**

Chapter 1 - introduces the research project. This highlights the importance of using video modelling for teaching students with autism. The scene is set for preparing the reader to question the use of video modelling to help teach a student with autism. This chapter outlines the background and the rationale to the research, specifically the challenges in teaching children with autism. The fundamental research question is stated. The methodology employed and the limitations of the research methodology are discussed.

Chapter 2 – Literature Review. This chapter reviews current literature on autism and the use of modelling and video modelling in education. It looks at the learning challenges individuals with autism encounter. It analyses why the use of video modelling could help students with autism to learn.

Chapter 3 outlines the research methodology used in this study. A ‘Single-Subject Case Study’ was used. The limitations and strengths of a single subject case study are also outlined. The chapter presents the research question and describes the setting and ethical considerations involved in the study. Finally it describes the methods of collecting the data, and the process by which this data was used for analysis.

Chapter 4 presents and analyses the findings under the headings – baseline, intervention, generalisation and maintenance. It shows the results of the study and graphs the results using Microsoft Excel.

Chapter 5 discusses the findings from the research in chapter four and compares the findings with the views of accredited researchers from the literature review.

Chapter 6 summarises the study, by presenting persuading arguments for the use of video modelling to teach students with autism. It also presents recommendations that have become evident from the research.

## **Chapter 2 - Literature Review.**

### **2.1 Introduction**

This literature review examines autism and the difficulties and challenges people with autism face in life. People with autism have difficulty in educational settings. They are visual learners which pose a lot of challenges for them in Irish schools that do not always cater for these types of learners. This chapter reviews modelling as a teaching method and its advantages and disadvantages. Specifically it examines video modelling in depth and looks at how video modelling can benefit students with autism to overcome some of their learning challenges.

### **2.2 What is Autism?**

Autism is a lifelong developmental disability. It is part of the autism spectrum and is sometimes referred to as an autism spectrum disorder, or an ASD. The word 'spectrum' is used because, while all people with autism share three main areas of difficulty, their condition will affect them in very different ways (DES, 2001). Some are able to live relatively 'everyday' lives; others will require a lifetime of specialist support.

The three main areas of difficulty which all people with autism share are sometimes known as the 'triad of impairments'. They are:

- difficulty with social communication
- difficulty with social interaction
- difficulty with social imagination.

According to the Task Force on Autism prevalence rates of individuals affected with autism are estimated to be in the region of 56 per 10,000 of the general population (DES, 2001).

### **2.2.1 Difficulty with social communication**

"For people with autistic spectrum disorders, 'body language' can appear just as foreign as if people were speaking ancient Greek."

People with autism have difficulties with both verbal and non-verbal language. Many have a very literal understanding of language, and think people always mean exactly what they say. They can find it difficult to use or understand:

- facial expressions or tone of voice
- jokes and sarcasm
- common phrases and sayings; an example might be the phrase 'It's cool', which people often say when they think that something is good, but strictly speaking, means that it's a bit cold.

Some people with autism may not speak, or have fairly limited speech. They will usually understand what other people say to them, but prefer to use alternative means of communication themselves, such as sign language or visual symbols. Others will have good language skills, but they may still find it hard to understand the give-and-take nature of conversations, perhaps repeating what the other person has just said (this is known as echolalia) or talking at length about their own interests. It helps if other people speak in a clear, consistent way and give people with autism time to process what has been said to them.

### **2.2.2 Difficulty with social interaction**

"Socialising doesn't come naturally - we have to learn it."

People with autism often have difficulty recognising or understanding other people's emotions and feelings, and expressing their own, which can make it more difficult for them to fit in socially. They may:

- not understand the unwritten social rules which most of us pick up without thinking: they may stand too close to another person for example, or start an inappropriate subject of conversation
- appear to be insensitive because they have not recognised how someone else is feeling
- prefer to spend time alone rather than seeking out the company of other people
- not seek comfort from other people
- appear to behave 'strangely' or inappropriately, as it is not always easy for them to express feelings, emotions or needs.

Difficulties with social interaction can mean that people with autism find it hard to form friendships: some may want to interact with other people and make friends, but may be unsure how to go about this.

### **2.2.3 Difficulty with social imagination**

"We have trouble working out what other people know. We have more difficulty guessing what other people are thinking."

Social imagination allows us to understand and predict other people's behaviour, make sense of abstract ideas, and to imagine situations outside our immediate daily routine. Difficulties with social imagination mean that people with autism find it hard to:

- understand and interpret other people's thoughts, feelings and actions
- predict what will happen next, or what could happen next
- understand the concept of danger, for example that running on to a busy road poses a threat to them
- engage in imaginative play and activities: students with autism may enjoy some imaginative play but prefer to act out the same scenes each time
- prepare for change and plan for the future
- cope in new or unfamiliar situations.

Difficulties with social imagination should not be confused with a lack of imagination. Many people with autism are very creative and may be, for example, accomplished artists, musicians or writers.

#### **2.2.4 Rigid behaviour patterns**

People with autism exhibit rigid thought and behaviour patterns, which may lead to obsessional behaviour, repetitive interests, and ritualistic play (Beyer and Gammeltoft, 1998). Sherratt and Peter (2002) observe that people with autism seem to lack the urge to engage spontaneously in playful behaviour and describe the rigidity of thought and behaviour as the antithesis of creativity. An education programme for students with autism will need to include structured and purposeful opportunities for them to develop creativity and imagination in order to provide a holistic and child-centred approach to learning and teaching (Sherratt and Peter, 2002).

### **2.2.5 Sensory and perceptual impairments**

Sensory and perceptual impairments can lead to an under sensitivity or oversensitivity to noise, smell, taste, light, touch, or movement, fine and gross motor difficulties, poor organisational skills, and difficulties in managing the time and sequence of activities (Autism Working Group, 2002; Jordan, 2001). Engaging in a risk assessment that systematically addresses the sensory and perceptual sensitivities of students with autism in relation to lighting, acoustic levels, heating and ventilation systems, classroom displays and colouring, assists in creating a supportive learning environment for students with autism. The use of clear directional signs indicating specific areas of activity and the consistent use of visual timetables and work systems assists in pre-empting the anxiety people with autism experience with the abstract nature of time (Mesibov and Howley, 2003). Gary Mesibov and Marie Howley are from the University of North Carolina. They have substantial experience in teaching students with autism. They use the TEACCH Programme to help inclusion of students with autism. TEACCH (Treatment and Education of Autistic and Communication Handicapped Children) was developed in the 1970s in North Carolina by Schopler and Mesibov and is one of the most commonly known and used intervention programmes. It is a whole life approach to helping people with autism, based on the principles of structured teaching and using the individual's visual strengths to augment comprehension. A main principle underlying TEACCH is that if the person can see it, he or she is more likely to understand it and be able to do it. There are four main strategies: physical structure; daily schedules or timetables; work systems; and visual clarity within tasks.

### **2.2.6 Visual Learners - Learning through seeing.**

Students with autism are visual learners. They think in images not words. Their primary language is pictorial not verbal. Temple Grandin an adult with autism elevated the world's awareness of the visual orientation of autism in her 1996 book 'Thinking in Pictures', which begins with this:

‘I think in pictures. Words are like a second language to me. I translate both spoken and written words into full-colour movies, complete with sound, which run like a VCR tape in my head. When somebody speaks to me, his words are instantly translated into pictures. Language-based thinkers often find this phenomenon difficult to understand.’

Most people learn in a variety of ways. They learn when they hear, when they see and when they experience something first hand. Often people prefer one method of learning over the others and try to use that method whenever possible. Although we may favour one method over another, most of us find all three ways of learning helpful. Students with autism also learn in a variety of ways. But research has shown that for many (Schopler et al., 1995) students with autism spectrum disorders when they are given opportunities to learn with visual cues, they:

- learn more quickly
- reduce aggressive or self-injurious behaviour
- decrease frustration and anxiety
- learn to adjust to changes at home and school
- complete tasks by themselves
- gain independence

Educators have developed and used visual cues to help their students achieve success in school and communities. Visual cues have helped students transition from one class to another, complete multi-step tasks and follow rules and routines as explained in the next section.

### **2.2.7 Visually cued instruction**

Visually cued instruction refers to the use of those cues such as objects, photographs, pictographs, written scripts or videos, in order to prepare, prompt or promote social

expectations. Visual cues provide tangible and concrete information without the relevant abstract language being necessary in order that individuals with autism attend to, organise or become aware of social events (Quill, 1997).

During the last decades, there has been an obvious shift in emphasis from language-based instruction to more visual instructional supports as a catalyst for learning in children with multiple disabilities and autism spectrum disorders (e.g. Bondy and Frost, 2002). For example Hodgdon (1999) documented that individuals with autism often experience difficulties in attending to, regulating or understanding auditory prompts and therefore visual prompts appeared to enhance their communication process. Structured teaching programmes that highlight visual stimuli instead of auditory stimuli in the treatment of children with autism have been recommended by other researchers (Schopler, Mesibov and Heasey, 1995).

Visually cued instructions have been successfully implemented to increase adaptive behaviours (Newman et al. 2000) and to decrease maladaptive behaviours in children with autism (Quill, 1997). Maladaptive behaviours refer to types of behaviours that inhibit a person's ability to adjust to particular situations. Visual instructions have been used to facilitate receptive language and to teach students how to follow activity schedules, learn vocational skills (Sowers et al. 1985) and home living skills.

Research studies have provided evidence that children and adults with autism are more able to attend to or remember visual materials than spoken language (O'Riordan, 2004). It seems that this observed pictorial superiority has a connection with atypical development of language in autism. Kamio and Toichi (2000) argue that since the pictorial semantic system is superior to the verbal one in typically developing children, this particular system is most frequently used by children with autism who typically display deficits in spoken language in order to process information from their environment. Evidence has shown that people with autism sustain attention to graphic

information at the same level as typically developing peers (Garretson, Fein and Waterhouse, 1990). Attention to concrete visual or graphic cues relevant to social or communication information can enhance attention and awareness of social and language messages in people with autism (Quill, 2000).

Visual instructions can highlight sequences of events that children with autism have to follow as the visual picture remains present until the whole sequence is completed (Mesibov et al. 2003). Temple Grandin (1996), currently an assistant professor with autism at the Colorado State University, characteristically stated the following about her visual thinking skills:

Many nonverbal people with autism can understand speech, and some are capable of reading and writing. I learned how to write proper English because my parents spoke proper English with almost no slang. To determine correct grammar I 'played a video' in my mind to see if the sentence sounded like mom or dad. (Quill 1997, p.38)

Finally, the popularity of television and video media relative to books suggests that many people prefer watching and listening to reading (Salomon, 1984). By taking advantage of the tendency of children with autism to better follow visual instructions, the use of videotapes can become one of promising means of training. Instructional videotapes are easily duplicated and exported and, properly packaged, may be useful to agencies with limited financial resources and technical expertise (Neef et al. 1991). In recent years these technological advances have been exploited and used in video modelling to teach students with autism. This will be discussed in Section 2.5.

### **2.3 Education Provision for students with Autism in Ireland**

Before examining modelling and video modelling which are sometimes used to teach students with autism, it is important to also look at the education provision for students with autism in Ireland over the last few decades.

For the greater part of the twentieth century no distinct or separate provision was made in the Irish education system for students with autism. Such students attended special schools according to their assessed level of general learning disability, and a significant number were enrolled in schools or classes for pupils with emotional and behavioural disturbance. Some students were also enrolled in special or ordinary classes in mainstream schools. The SERC Report advocated that, where such enrolment was considered to be the most appropriate, students with autism should continue to be enrolled in special schools for pupils with emotional and behavioural disorders and in special schools for pupils with general learning disabilities (Ireland, 1993). It was further recommended that a teacher be sanctioned in respect of every six pupils with autism, and that additional teaching support be made available to pupils with autism enrolled in ordinary schools. The report proposed that account be taken of such factors as the pervasiveness and degree of severity of the autistic symptoms, the level of intelligence and the level of language development when the most suitable educational placement for students with autism was being considered.

### **2.3.1 Generalised Learning Disabilities**

Learning disabilities and autism can occur together in up to 75% of cases (Bryson and Smith, 1998). General learning disabilities are classified as mild, moderate and severe and profound. The National Council for Curriculum Assessment (2002) and The Report of the Special Education Review Committee (1993), describe each type of learning disability as follows:

Mild general learning disability presents as delayed conceptual development, slow speed and language development, limited ability to generalise, limited attention span and poor retention ability. It also stated that the number of children in this category might exhibit poor adaptive behaviour, inappropriate or immature personal behaviour, low self-esteem, emotional disturbance and poor motor co-ordination. Children with mild general learning disabilities are described as having an IQ in the range of 50 to 70.

Moderate general learning disability is described as presenting with impaired development and learning ability in acquiring skills in relation to language, communication, social and personal development, motor coordination, literacy and numeracy, mobility and leisure pursuits. Children with moderate general learning disability are described as having an IQ in the range of 35 to 50.

Severe to profound general learning disability is categorised as severe impairment in the ability to function, in respect of a basic self-awareness and an awareness of the environment. The skills relation to perceptual and cognitive development, language and communication, self-care, motor abilities, social and perceptual development all requires attention. Children with a severe learning disability are described as having an IQ in the range of 20 to 35 and children with a profound disability as having an IQ below 20.

The National Council for Curriculum and Assessment has published a series of guidelines to assist schools in meeting the needs of students with mild, moderate and severe to profound general learning disabilities (National Council for Curriculum and Assessment, 2002). These guidelines are designed to be used in association with the Primary School Curriculum in order to promote access to the curriculum through acknowledging and accommodating the special educational needs arising from students' particular levels of general learning disability, as outlined in the SERC Report. A teaching and learning programme for students with autism should therefore accommodate both the special educational needs of students that arise from an assessment of autism and the associated impact of a general learning disability (Jordan, 2001).

## **2.4 Modelling**

The challenges students with autism face (communication, imagination and interaction) can be overcome using methods such as modelling and video modelling. This section and the following section outline these methods and their advantages.

Modelling is a powerful tool both for teaching new behaviours and for improving already acquired ones. Modelling occurs when a sample of a given behaviour is presented to an individual and then that individual engages in a similar behaviour. The individual observes the behaviour and then copies the behaviour.

### **2.4.1 Observational learning**

Observational learning is where the observer watches a model perform a behaviour and then the observer does the same. Monkey see, monkey do! However, imitation of a model does not necessarily mean that observational learning has occurred, nor does failure to imitate a model mean that learning has not occurred. Two main theories of observational learning have been developed based on the social cognitive theory of Bandura (1965) and the reinforcement theory of Miller and Dollard (1967).

Bandura suggests that observational learning can be explained through four processes that occur during or shortly after observation of a model. First, attentional processes take place while a person observes the relevant aspects of the model's behaviour and its consequences. The observer attends to the model and watches what the model does and what happens when the model behaves in that way. Second, once that person is attending to these aspects of the model's behaviour, retentional processes follow. These are actions that the observer performs in order to evoke the modelled behaviour. That is, he or she may verbally represent the modelled behaviour or repeatedly perform that behaviour in some way. Third, the observer must have the motor reproductive processes

necessary to perform the model's behaviour (i.e. he or she must be physically able to engage in the behaviour). The observer must have the fine or gross motor skills to copy what the model has done. Finally, motivational processes are essential, especially in determining whether a modelled behaviour will be imitated. The observer must be motivated to copy what the model has done. The observer must see that they will be rewarded or reinforced for doing the same thing as the model. According to Bandura, the observer must have an expectation that an imitated behaviour will produce a reward known as reinforcement; otherwise he or she will not display it. Therefore, reinforcement could affect the performance of the behaviour, but not the learning of it. If the observer feels the reinforcement is not worthwhile if they copy the models behaviour, they may not do it.

#### **2.4.2 Advantages of Modelling**

Modelling as a treatment procedure can be a powerful tool both for learning new behaviours and improving already acquired ones. That is, a correct behaviour is demonstrated for the learner, the learner observes and imitates the model's behaviour which eventually replaces his or her previous incorrect behaviour. Modelling can produce rapid gains as it may take only one modelled instance for an observer to learn a new behaviour. Therefore, in many circumstances the procedure of modelling has the advantage of allowing the learner to demonstrate new responses without errors (Grant and Evans, 1994).

Another advantage of modelling is the assumption that it is a natural method of teaching that occurs regularly in our everyday lives. People have the potential to act as models as any behaviour they engage in may be imitated and, in a way, transferred by others to the next generations. A great amount of the behaviour that any socialised human has learned, initially developed by observing someone else engage in similar behaviour (Martin and Pear, 2002). Through modelling, parents teach their children an enormous number of behaviours even from infancy. The child watches the behaviour of his or her parents initially and then the behaviour of his or her peers, and afterwards tries the

behaviour on his or her own. On occasions when it is not possible for a child to learn through this kind of observation (this issue usually concerns the most developmentally delayed children), a specific training programme needs to take place.

Modelling procedures have been used to solve a variety of behavioural problems. Modelling can be effective in teaching verbal behaviour and a wide variety of self care skills, in reducing unreasonable fears, in improving communication or in preparing academic activities. Modelling represents a constructional approach to behaviour change in that it specifies desirable behaviours to be emulated. When someone uses modelling then he or she must have defined such desirable behaviours that are worth engaging in.

### **2.4.3 Disadvantages of Modelling**

People often forget how influential their behaviour can be on others and they underestimate the effects that their behaviours may have when they behave in undesirable ways (Martin and Pear, 2002). The powerful characteristics of modelling that are advantageous also present some disadvantages. In 1961 Albert Bandura from Stanford University, California conducted an experiment known as the 'Bobo Doll Experiment'. The experiment was conducted on 72 nursery school children. Some children were exposed to a model behaving aggressively towards a doll. Bandura found that the children exposed to the aggressive model were more likely to act in physically aggressive ways than those who were not exposed to the aggressive model. An important concern is the effects modelled aggression and violence that the visual mass media usually show to viewers, especially when these are children. A study by Bandura in 1965 showed that aggressive behaviour suddenly increased when children had been exposed to violent movies. The general conclusions of this study were:

- Children engaged in specific forms of aggressive behaviour, often identical to the ones previously shown in the films.

- Increases in aggressions usually remained after the violent films were no longer shown.
- The amounts of physical and verbally aggressive behaviours that the children exhibited to one another were related directly to the amount of time that had passed since the movie viewing.

As a result of the above, people and more importantly children should be exposed to admirable and interesting models. It would be best if these models were non-aggressive and exposure to aggressive and violent models be reduced (Bandura, 1965).

#### **2.4.4 General Characteristics of Modelling**

There are a number of general characteristics of modelling. First, the observer may imitate the new behaviour after the first exposure to the model's behaviour only when this new behaviour is one or two steps ahead of the observer's present level of competence. If a behaviour is too difficult for the observer to imitate they will not imitate. When a model's behaviour is several steps ahead of the observer's current abilities, then the observer is less likely to perform a similar behaviour successfully without practice (Baldwin and Baldwin, 1986).

Second, for modelling to occur, the observer has to be able to attend to the model's behaviour in order to demonstrate the same or a similar behaviour. Attending can be defined as the observer staying seated, keeping hands on a table, looking at the model/trainer when his or her name is called and looking at the objects that the trainer may indicate (Baldwin and Baldwin, 1986). Unless the observer is able to attend they will not be able to copy the models behaviour.

#### **2.4.5 Types of Modelling.**

For people with autism learning through modelling usually has to be taught to them. These techniques include:

1. Exact and behaviour-feature imitation – when all the features of the model’s behaviour are imitated, then exact imitation occurs.
2. Generalised imitation – the individual imitates the behaviour on the first trial without reinforcement or reward.
3. Peer modelling – when a model is close enough to the skills, age or status of the observers. Peer modelling begins at a young age and it stands as a powerful social influence. Studies suggest that it is highly desirable for everybody to have opportunities to observe peers who are skilled, especially in areas in which people tend to be deficient (Grant and Evans, 1994).
4. Self modelling – the positive behaviour change that results from watching oneself on videotapes performing exemplary behaviours (Morgan and Salzberg, 1992). In autism, self-modelling has been suggested as an effective technique in reducing challenging behaviour.
5. Video modelling – defined when the instances of modelling in which the model is not a live one, but one that is videotaped in an effort to change existing behaviours or learn new ones (Morgan and Salzberg, 1992).

## **2.5 What is Video Modelling?**

Video modelling involves the student “observing a videotape of a model engaging in target behaviour and subsequently imitating” (Charlop-Christy, Loc, and Freeman, 2000, p. 537). Video modelling is a technique that involves demonstration of desired behaviours through video representation of the behaviour. A video modelling intervention typically involves an individual watching a video demonstration and then imitating the behaviour of the model. Video modelling can be used with peers, siblings, adults or self as a model (video self modelling). Video modelling procedures have been used successfully to teach children with autism a variety of adaptive behaviours including social, play, requesting, self-care, purchasing, and academic skills. Video feedback involves videotaping the target individual performing specific behaviours and

then co-reviewing the videotape so that the person can evaluate his or her own behaviours.

Video modelling is defined as the instances of modelling in which the model is not a live one, but one that is videotaped, in an effort to change existing behaviours or learn new ones (Dowrick, 1991). Initially, an observer discriminates a model's behaviour and, afterwards, he or she demonstrates that specific behaviour in natural settings (Morgan and Salzberg, 1992).

Video modelling is often excluded from published recommendations of evidence-based practices for individuals with ASD (Morgan and Salzberg, 1992). Skills learned via video modelling generalise across different settings and conditions. The positive gains made during the video modelling intervention are maintained for months following the conclusion of the intervention (Dowrick, 1991). This is particularly important for children with ASD who have considerable difficulties transferring skills from one setting to another.

Video modelling as a treatment procedure has been effective in a variety of situations, both with typically developing children and those with developmental disabilities (Nikopoulos and Keenan, 2004). For example, published studies using children with autism have demonstrated that video modelling can be effective in teaching generalisation of purchasing skills across community settings (e.g. Haring et al. 1995). Students can enter a shop and buy a number of items. Video modelling helps them to generalise this skill – in other words to purchase goods in a number of shops not just one shop.

Studies have shown that video modelling can help in functional living skills (Shipley-Benamou, Lutzker and Taubman 2002), where students can learn to cook and clean

following the watching of a video demonstrating this. People with autism have difficulty during play and video modelling has helped in increasing play-related comments of children with autism towards their siblings (Taylor, Levin and Jasper, 1999). Video modelling has helped in reducing disruptive transition behaviour (Schreibman, Whalen and Stahmer, 2000). Transition is where students move from one activity to the next for example from play time to work time or from Art Class to Science Class.

### **2.6.1 How can Video Modelling benefit students with Autism?**

Video modelling makes use of the visual strengths observed in people with autism requiring them to become 'movie readers'. Video modelling seems to offer many benefits to individuals with autism (Corbett and Abdullah, 2005). Some of the benefits include:

- It does not require any initial instructions or specific training.
- It demands less prerequisite skills than activity schedules.
- It does not require contingent reinforcement upon the success of imitations.
- It promotes generalisation across settings and therefore no continuous use of video display is needed. Learning is continued even in the absence of the 'intervention medium'.

### **2.6.2 Research on the use of Video Modelling**

During the last three decades video modelling has been used in the treatment of individuals with autism in a variety of different forms. In 1982, Steinborn and Knapp from the University of Sydney first reported empirical evidence on the use of video modelling as a treatment procedure for a child with autism. They used a behavioural training programme and a classroom based model of a traffic environment in order to teach a child with autism pedestrian skills. Specifically, they used video recordings to familiarise the child with traffic at local intersections and their results revealed positive

effects of the treatment package which generalised to the natural environment with minimal training.

In California Haring et al. (1987) investigated the generalisation of purchasing skills across community settings to youths with autism using videotape modelling. Their results showed that video modelling was effective in increasing independent functioning and social responding in three community settings for all three students. They also argued that although they did not control for potential sequence effects, video modelling procedures would be a promising addition to the behavioural strategies for promoting generalisation. However, another study by Haring and his colleagues (1995) provided further support for the effectiveness of direct community instruction combined with videotape modelling in promoting generalisation of shopping skills.

A study was carried out by Alcantra in the U.S. in 1994 where he further evaluated the effects of a videotape instructional package (i.e. viewing videotapes, on-site prompting and reinforcement) on the acquisition and generalisation of purchasing skills in community settings. He taught 3 students with autism to purchase groceries in a shop. Specifically, this study analyzed the acquisition and generalisation of purchasing skills across three community settings for these students. The results of that study revealed that a videotape instructional training package can be an effective strategy for teaching community survival skills.

A study in California in 1989, by Charlop and Milstein used video modelling to teach script conversations to three boys with autism who attended an after-school programme. After training, not only did the children's conversational skills generalise to different toys, unfamiliar persons and different settings, but new responses increased that were not included in the videotapes. It should be noted that the conversations were not initiated by the children, but by therapists, unfamiliar adults or siblings who, instead, provided the questions to them. (Stevenson, Krantz and McClannahan, 2000).

In 1999, Taylor et al. from New Jersey conducted two experiments in order to increase play related statements in two children with autism towards their siblings. In both experiments the procedures comprised of two main phases, video viewing and practice; subsequently changes in behaviour were assessed in probe sessions with the participants' siblings. That is, in the first experiment a child with autism initially watched scripted play comments between his sibling and an adult. Then he participated in practice sessions using the same stimuli in the presence of an adult. In their second experiment, the researchers presented brief segments of video models of play comments between an adult and his sibling to another child with autism, who afterwards practiced the acquisition of play comments while playing with an adult. Both of these studies revealed that video modelling was an effective intervention for teaching children with autism to make scripted and unscripted play statements while playing with their siblings. In the same year, Buggey and his colleagues (Buggey et al. 1999) used videotaped self-modelling to promote responding in three children with autism. Specifically they investigated the effectiveness of this video-based procedure in the acquisition and maintenance of appropriate verbal responses to questions and their results showed that the three participants substantially increased their rates of appropriate responding to questions during play situations.

In 2000 Schreibman et al demonstrated that using a video to preview future events could be effective in reducing or eliminating the disruptive behaviour of three children with autism in transition situations. Transition situations are where children move from one activity to another e.g. from Art to Music. Students with autism find transition particularly difficult. The results of a second study by Charlop-Christy et al. (2000) in California revealed that video modelling was not only an effective method for teaching children with autism a variety of skills (e.g. expressive labelling, spontaneous greetings, conversational speech) which generalised across persons, settings and stimuli, but it was also superior to observing a live model. The study was designed to compare the effectiveness of video modelling with in vivo modelling (live modelling) for teaching developmental skills to children with autism. Five children were involved in the study

comparing video and in vivo modelling. Each child was presented two similar tasks from his or her curriculum; one task was used for the video condition, while the other was used for the in vivo condition. Video modelling consisted of each child watching a videotape of models performing the target behaviour, whereas in vivo modelling consisted of the children observing live models perform the target behaviour. After the observations, children were tested for acquisition and generalisation of target behaviours. Results suggest that video modelling led to faster acquisition of tasks than in vivo modelling and was effective in promoting generalisation.

Following this, a study was conducted in the University of California, San Diego by Sherer et al. (2001). They replicated previous findings in enhancing conversational skills in children with autism and, more importantly, they demonstrated that using a model was equally as effective as using self as a model (video self modelling). Five children with autism ranging in age from 4 to 11 were taught to answer a series of conversational questions in both self and other video-modelled conditions. Often the model they used resembled the person it was aimed at eg. A blonde haired boy, blue-eyed boy aged 10 would be used as the model as they would look similar to the observer.

The following year Shipley-Benamou et al. (2002) implemented an instructional video modelling technique to teach functional living skills such as making orange juice, preparing a letter to mail and putting the letter in the mailbox, pet care and table setting to three children with autism. D'Ateno et al. (2003) taught a pre-school girl with autism verbal motor responses during three play activities (having a tea party, shopping and baking). Another study using a computer format in combination with video rewards examined generative spelling in a girl with autism (Kinney et al. 2003). The acquisition of that skill helped the girl to acquire literacy skills at a level with her general school placement. In the final article of that year, Sturmey (2003) concluded that video technology can be a powerful tool for teaching appropriate adaptive behaviour, independent play and academic tasks to children with autism.

In 2003 Rehfeldt et al. evaluated a video modelling procedure for teaching meal preparation to three adults with moderate to severe special needs. The video, which lasted 2.5 min, showed an adult making a sandwich following a 17-step task analysis. The three participants were verbally prompted to watch the entire video. After watching the video, the participants were given the opportunity to make a sandwich. Implementation of this video modelling procedure was associated with an increase in the percentage of steps completed correctly and eventual attainment of 100% correct for all three participants. Following acquisition, all three participants maintained high levels of performance, even though they did not watch the video prior to the 1-month follow-up session. This data suggests that once the skill had been acquired, the skill maintained for 1-month in the absence of video modelling.

In 2004, Dauphin, Kinney and Stromer evaluated an intervention package comprised of video enhanced activity schedules used to teach a child with autism to play. Results of that study provided evidence that the child responded extremely well to the video enhanced activity schedules and was able to follow this schedule extremely well. Coyle and Cole (2004) examined videotaped self-modelling to decrease the rates of off task behaviour in three children with autism. Off task behaviour means, when students are supposed to be participating in a task and instead do something else eg. If they are meant to be painting they might just stare at the sheet of paper. They demonstrated that the intervention package produced considerable decreases in off-task behaviours during the period of intervention and this continued following the intervention.

A study done in Arizona by Simpson, Langone and Ayres (2004) used a computer-based instruction programme with embedded video clips to promote social skills such as sharing, following directions and social greetings in four children with autism. Specifically, children were taught how to discriminate examples from non-examples of social behaviours displayed in the video clips. Results showed that this training package

was effective in teaching individuals with autism a few social skills in their natural environment.

A study in the University of Washington looked at the effectiveness of video modelling to increase compliment giving behaviours of children with high functioning autism (Apple, Billingsley and Schwartz 2005). Children with high-functioning autism spectrum disorders (ASD) typically exhibit a lack of social reciprocity skills. They often struggle to maintain conversations, especially with topics of little or no interest to them, and to create meaningful relationships. By giving compliments to others, children with ASD have a means by which to show approval for issues of interest to others. Compliment giving by children increased and this met with greater approval from peers.

In 2006 Maione et al. from the University of Vancouver identified practical strategies for teaching children with autism to use social language with their peers. Video modelling was used to teach a child to use social language with typical peers during play. Video modelling was effective in increasing social language in two of the three activities. Prompting was required in the third activity.

Increasing social engagement in young children with autism using video modelling was demonstrated by Bellini and Akullian in 2007. The study examined the effectiveness of video modelling and video self-modeling (VSM) interventions for children and adolescents with autism. Twenty-three single-subject design studies were included in the study. The primary purpose of this study was to examine the benefits of video modelling intervention in increasing the social engagement of young children with autism spectrum disorders. The study expands previous research on video modelling by measuring social interactions with same-aged peers in a natural setting rather than with adults in a controlled clinical setting. Results suggest that video modelling and VSM are effective intervention strategies for addressing social-communication skills, functional skills, and behavioural functioning in children and adolescents with autism. Results also indicate that these procedures promote skill acquisition and that skills acquired via video modelling and VSM are maintained over time and transferred across persons and

settings. The results suggest that video modelling and VSM intervention strategies meet criteria for designation as an evidence-based practice.

Sansosti and Powell-Smith (2008) investigated the effects of computer-presented Social Stories and video models on the social communication skills of three children with High-Functioning Autism/Asperger's Syndrome (HFA/AS). Using a multiple baseline across-participants design, computer-presented Social Stories and video models were implemented and direct observations of the participants' identified target behaviors were collected two times per week during unstructured school activities (e.g. break-time). Overall, data demonstrated that the combined treatment package was effective for improving the rates of social communication for the participants.

In 2010 Cihak et al. evaluated the efficacy of video modelling delivered via a handheld device (video iPod) to assist teenage students with transitioning between locations and activities within the school. Four students with autism learned to manipulate a handheld device to watch video models. The data indicate that all participants began transitioning more independently after the intervention was introduced and that their performance decreased with withdrawal of intervention. These results are presented in the context of how a portable video delivery system can aid students who spend considerable portions of their day in general education settings where traditional means of delivering video models (e.g., televisions and computers) may not be as accessible.

### **2.6.3 Potential advantages of video modelling for students with autism**

Video modelling seems to offer many advantages to individuals with autism (Corbett and Abdullah, 2005). Video models can present a variety of different behaviours in realistic contexts such as in a shop, at the library or out in the playground (Haring et al. 1987). A videotape can be designed to provide a high degree of similarity between the real experience and the experience shown in that videotape. Individuals with autism are

expected to display more appropriate behaviours than they would have using other training techniques in simulated settings (Alcantara, 1994).

In a study by Stephens and Ludy (1975) they demonstrated that film instruction (i.e. video) was superior to slide instruction (i.e. pictures) because the film instruction (1) depicted the real actions in process, (2) presented the concepts in a systematic and simple format and (3) gained and kept the students attention effectively. Videotape instruction can provide training that is much more similar to the natural environment because of the high degree of similarity between the videotape experience and the real experience (Alcantra, 1994). Similar conclusions were drawn up by Charlop-Christy and her colleagues (2000) where they compared video modelling with live modelling using children with autism.

Video may be a useful medium for learners who cannot take advantage of print materials or of complex language repertoires (Browning and White, 1986). Many students with autism are unable to read or find comprehending written text difficult. It would be much easier for these students to observe a video and they could imitate the skills they need to learn.

Video can take advantage of the observed attention skills of children with autism as they favour viewing themselves in video and enjoy watching the same scenes repeatedly (Krantz et al. 1991). Observational learning skills in children with autism are further developed as they can repeatedly review a model's behaviour during a treatment procedure, and these children may discriminate cues in their environment that are needed to function independently (Bryan and Gast, 2000). Also, it has been suggested that video viewing is a low demand activity as well as being highly flexible and that it is naturally reinforcing to people with autism. The use of video strengthens internal consistency and reliability in data collection. It allows for more confident comparisons of data across learners and sessions such as recording of sequences or correct responses

or assessment of complex behaviours (Morgan and Salzberg, 1992). In other words it facilitates standardisation of behaviour measurement.

Video modelling promotes discrimination training for the target children or their families, by including error models. In this way, not only does training in the correct responses take place, but it is also relatively easy to show which responses are to be avoided (e.g. Reamer et al. 1988).

The video medium provides new opportunities for addressing the generalisation deficits displayed by children with autism. For example, Daoust et al. (1987, cited in Dowrick 1991) demonstrated that by employing delayed consequences through the use of video, generalisation across settings and people was established. People with autism were able to use the skills they observed on the video in a number of settings not just the one which often happens when instructing students with autism.

Finally, video modelling serves as an efficient, cost-effective and convenient teaching tool in the treatment of individuals with autism (Charlop et al., 2000). That is, video recording of a model's actions just once would negate the high cost of live models employed in many kinds of training programmes (Racicot and Wogalter, 1995).

## **2.7 Conclusion**

This chapter has examined autism and outlines the triad of impairments (social communication, interaction and imagination). It has also looked at the education provision for students with autism in Ireland over the last three decades. Modelling is a

powerful tool both for teaching new behaviours and for improving already acquired ones. This teaching method was explored, its advantages and disadvantages and the different types of modelling, including video modelling were discussed. The research question of this thesis will examine video modelling and the final section of this chapter examined the research to date in this area. It also examines its advantages which can benefit students with autism to overcome some of their challenges.

# **Chapter 3 Methodology**

## **3.1 Introduction**

The purpose of this chapter is to outline in detail the research methodology that was employed in completing this project. This chapter will examine the aims, objectives and research question of the project. The research methodology chosen to carry out this research will be discussed.

### **3.1.1 Aims, Objectives and Research Question**

This research project aims to examine the potential impact of video modelling on the teaching and learning of a student with autism. Students with autism are visual learners. They think in images not words. Their primary language is pictorial not verbal. The objective of this research project is that the student will be able to complete the home economics practical in the Junior Certificate examination. It is hoped that the objective will be achieved using a single-subject case study to teach the student the task of baking scones.

### **3.1.2 What has the research highlighted?**

Literature has highlighted that students with autism must learn a variety of social, domestic, and leisure skills in order to function independently (Belfiore and Mace, 1994). The literature review highlighted the many cases of the use of video modelling to teach life skills to students with autism. Video modelling, defined as the viewing of a videotape of a peer or instructor successfully performing a task (LeGrice and Blampied, 1994), has been shown to be one effective strategy for developing such skills. Typically, an individual is asked to view the video at the beginning of an instructional session and to then attempt the task independently. Video modelling has proven to be an effective intervention for teaching a variety of life skills to students with autism.

### **3.1.3 The Setting**

Research was carried out during the period September 2009 to January 2010, in a secondary school in Galway. The setting for the research was the home economics Room in the school and in the student's home.

### **3.1.4 The participant**

One student participated in this study. He has a diagnosis of autism according to the DSM-IV criteria (American Psychiatric Association, 1994). In addition he has been diagnosed with a mild general learning disability. The student attends an autism unit attached to a mainstream secondary school. He spends part of his day in mainstream classes one of which is home economics. He hopes to complete the Junior Certificate home economics Exam in June. Part of this exam contains a practical examination where the student is required to bake or cook something. The student has been taking part in a practical class every week for the past three years. He enjoys the cookery class but is very dependent on assistance from his Special Needs Assistant. It is hoped that the student will become more independent at the task of baking scones following video modelling.

### **3.1.5 Special Needs Assistant (S.N.A) Profile**

The SNA has been accompanying the student to home economics class for the past three years. She feels while he likes cookery the student needs a lot of assistance during the practical class and is very slow to do things on his own initiative. The SNA feels that if the student is to do the practical home economics exam that he needs to be much more independent.

## **3.2 Research Methodology.**

### **3.2.1 Single Subject Design**

Professionals working with students with autism prefer to use single subject designs (Dunlap and Kern, 1997). Single subject designs provide structures for evaluating the performance of individuals rather than groups. Whereas group designs identify the effects of variables on the average performance of large numbers of students, single-subject designs identify the effects of variables on a specific behaviour of a particular student. These designs monitor the performance of individuals during manipulation of the independent variables.

Single-subject designs require repeated measures of the dependent variable. The performance of the individual whose behaviour is being monitored is recorded weekly, daily, or even more frequently over an extended period of time. The individual's performance can then be compared under different experimental conditions, or manipulations of the independent variable. Each individual is compared only to himself or herself. Single subject research emphasises clinical significance for an individual rather than statistical significance among groups. If an intervention results in an observable, measurable improvement in functioning, often referred to as enhanced functioning, the results of the experiment are considered to have clinical significance.

For this project a case study was deemed the most appropriate research method. Case studies focus on evaluation elements or intervention elements from which deductive conclusions may be drawn for intervention or changes in intervention methods. This research method involves a great deal of observation and careful study of the presenting condition viewed within whatever context is deemed appropriate. In the case of this project the student is observed baking scones. For every task he can complete independently it is recorded. Case studies are pre designs and may lead toward development of AB designs (Bloom et al., 2003).

### **3.2.2 AB Designs**

The AB Design is a teaching design. The AB design is the basic single-subject design. The designation AB refers to two phases of the design: the A, or baseline phase, and the B, or intervention phase.

### **3.2.3 Baseline Measures**

The first phase of single-subject design involves the collection and recording of baseline data. Baseline data are measures of the level of behaviour before intervention. The data describes the existing level of student performance. When data points are graphed, they provide a picture of the student's behaviour. To evaluate the success of an intervention the teacher must know what student performance was like before the intervention. The baseline phase continues for several sessions before the intervention phase begins. In most instances, at least five baseline data points are collected and plotted.

### **3.2.4 Intervention Phase**

The second phase of any single subject design is a series of repeated measures of the subject's performance under a treatment or intervention condition. The independent variable (intervention) is introduced, and its effects on the dependent variable (the student's performance) are measured and recorded. Trends in data indicate the effectiveness of the intervention and provide the teacher with guidance in determining the need for changes in intervention procedures.

During the A phase; baseline data is collected and recorded. A is the baseline observation period or the evaluation of current level of performance. Once a stable baseline has been established, the intervention is introduced, and the B phase begins. The intervention often attempts to improve or maximise the current level of performance through theory-based methods. In this phase, intervention data is collected and recorded. The teacher can evaluate increases or decreases in the amount of the target behaviour during the intervention phase and compare them with the baseline

phase. Using this information to make inferences about the effectiveness of the intervention, the teacher can make decisions about continuing, changing or discarding the intervention.

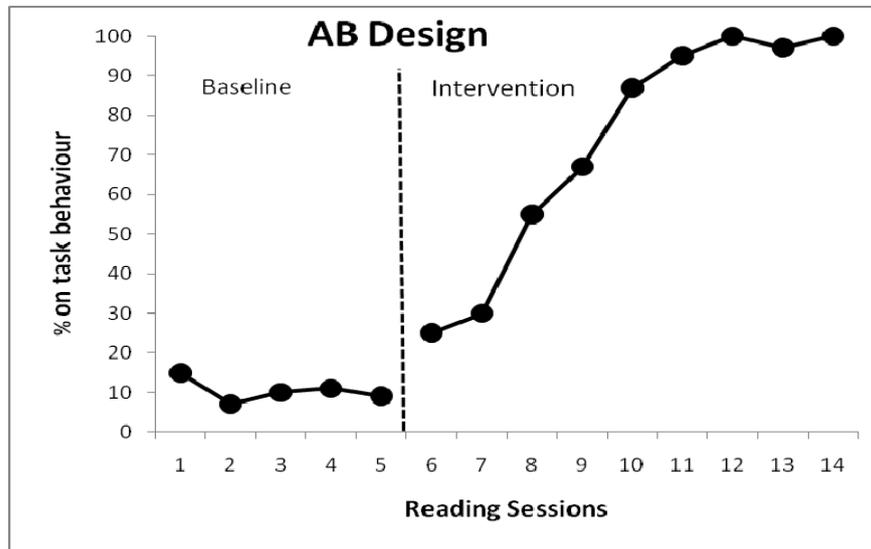


Figure 3.1: AB Design Graph

The primary advantage of an AB design is its simplicity. It provides the teacher with a quick uncomplicated means of comparing students' behaviour before and after implementation of some intervention or instructional procedure, making instruction more systematic.

The disadvantage of the AB design is that it cannot be used to make a confident assumption of a functional relation. Although the data may show an increase or decrease in the behaviour during the intervention phase, thus indicating effectiveness of the intervention, this design does not provide for replication of the procedure.

### **3.2.5 Generalisation Phase**

The third phase of single-subject design involves the collection and recording of generalisation data. To see if an intervention has worked to teach a skill, it must be seen if the student can generalise the skill to other environments. To program meaningful behaviour change, teachers must use the principle of generality. Baer, Wolf and Risley (1968) stated: ‘A behavioural change may be said to have generality if it proves durable over time, if it appears in a wide variety of possible environments or if it spreads to a wide variety of related behaviours.’ (page 96). Generalisation is of great importance in assuring that what has been learned during the intervention phase can be transferred to other environments. A student has generalised if they can perform and adapt the skill learned under different conditions from those in place during acquisition. During the generalisation phase data is recorded in the same way as during the baseline and intervention phases.

### **3.2.6 Maintenance Phase**

The fourth phase of single-subject design involves the collection and recording of maintenance data. Maintenance is the ability to perform a task over time without re-teaching. Maintenance level competence is confirmed by using post checks or probes, during which the teacher rechecks the skill, to be sure the student can still do it. Most skills that teachers want students to perform should occur after intervention has been withdrawn. The skill is maintained over time. During the maintenance phase data is recorded in the same way as during the baseline, intervention and generalisation phases.

## **3.3 Making the Video**

It was decided for this research assignment to use a peer as a model in the intervention video ‘Baking Scones’. Peers make very effective models when teaching students with autism. Peer modelling has been a long standing practice in educational settings, so the fact that using peers as models has achieved an important status in video modelling

studies comes as no surprise (Taylor et al., 1999). The student selected to participate in the video is in the student’s mainstream home economics class and will be completing a practical exam in home economics also. He is extremely familiar with the skills required to bake scones. The researcher watched the peer bake scones in order to produce the list of tasks required to bake scones successfully. Each task was recorded on camera and made into a video. This video was then used in the intervention. The student watched the video of the peer baking scones.

### 3.4 Timeline for collecting Data

<b>Project Timeline for Data Collection</b>	
September 2009	Baseline Data
October 2009	Intervention Data
November 2009	Intervention Data
December 2009	Generalisation Data
January 2010	Maintenance Data

*Table 3.1: Project Timeline for Data Collection*

All instructional sessions were conducted in the home economics kitchen in the school. The room contains eight work stations each with a self contained kitchen including cooker, table, presses, drawers, sink and draining board.

A baseline is established where the student was instructed to make scones. Data was taken of the times the student could perform the instruction independently. The purpose

of establishing a baseline was to assess the students' performance in the absence of the video presentation.

The student was then required to watch the DVD of a model baking scones. Video modelling was the intervention used to help the student acquire the skill to bake scones independently. A typically developing peer acted as a model on the DVD. On the DVD the model was shown in the home economics room in the school. The model went through the required method of baking the scones. Having watched the DVD the student was brought to the home economics room where ingredients and utensils needed were laid out and was told to 'Bake Scones'.

An important part of an aspect of a newly acquired skill for students with autism is the assessment for generalisation of the skill. That is, once an intervention (in this case video modelling) has produced the desired changes in the target behaviour then an additional assessment takes place in the absence of the intervention to determine whether the acquired skill is permanent and generalises to other situations. The generalisation assessment took place in the student's home. The student baked scones at home with a similar set up as used in school. All ingredients and materials required were available.

A month following the generalisation assessment a maintenance assessment was carried out where the student baked scones. Maintenance is the ability to perform a skill after the intervention has been withdrawn. This assessment is to see if the student still remembers the acquired skill.

### **3.5 Task Analysis**

Breaking complex instructions into its component parts is called task analysis. Task analysis forms the basis of many of the teaching strategies used to teach individuals

with autism to perform complex instructions. Before the teacher can select the instructions they must decide exactly what they are teaching and break the task down into manageable components. Task analysis requires considerable practice but can be applied to many practical situations such as dressing, eating or shopping for groceries.

Task analysis is the basis for programs teaching complex functional and vocational skills to students with disabilities. It is theoretically possible, by breaking a task down into sufficiently small components, to teach anybody anything. Time limitations make it impractical to teach some students some things.

### 3.5.1 Task Analysis to bake scones

The task of baking scones was chosen for the participant. The task analysis and materials needed to bake scones are shown below. The task analysis was devised after several observations of a student baking scones. This student was proficient in performing the task. This individual served as the model in the video that was presented to the participant.

<b>Task Analysis</b>	
1. Turn oven on to gas mark 6.	<b>Ingredients</b>
2. Sieve Flour into bowl	Flour
3. Put Sugar in bowl	Sugar
4. Put Margarine in bowl	Margarine
5. Make crumbs - Rub together using fingers	Milk and egg
6. Add milk and egg mix	
7. Mix ingredients in bowl using wooden spoon	<b>Equipment</b>
8. Make a dough ball	Bowl
9. Sprinkle flour on table	Wooden spoon
10. Using knuckles knead mix into a ball	Sieve
11. Roll out ball using rolling pin	Rolling pin
12. Cut 6 scones using cutter	Scone cutter

13. Put scones on baking tray	Baking tray
14. Dip brush in milk	Wire tray
15. Brush scones with milk	Oven glove
16. Open oven	Display basket
17. Put scones in oven	Cloth
18. Close oven door	Dish towel
19. Bring dishes from table to sink	
20. Wipe down table using cloth	
21. Wash dishes	
22. Dry dishes	
23. Put away dishes	
24. Take scones out of oven	
25. Check scones cooked	
26. Put scones on wire tray	
27. Wash baking tray	
28. Dry baking tray	
29. Put away baking tray	
30. Put scones in basket for display	

*Table 3.2: Task Analysis- Baking Scones*

A lap-top PC computer with a 12.5 x 10 inch screen was used to present the video of the model baking scones. The video was played in Windows Media Player.

### **3.6 Design**

The student was instructed using verbal and written instructions how to bake scones. Baseline data was collected during this phase. Video modelling was presented in the training setting. The student was shown a video of a peer baking scones. Following

observation of the video modelling the student demonstrated baking scones. Data was collected following this intervention phase. The student baked scones at home – this is known as generalisation of the acquired skill. The student was able to apply what he had learned from the video modelling and bake scones in another setting. The student was observed baking scones a month following acquisition of the skill – maintenance. Data was taken to ensure the skill was maintained. Throughout the study, the student was allowed to consume the scones, if he so chose after the completion of each session

### **3.6.1 Measuring data – Data Collection Sheet**

Data needs to be collected. With a measurement system in place it is possible to determine the effects of an intervention. Data collection gives information about a student's performance as well as the intervention effectiveness. The data shows whether intervention needs to be adjusted. Apart from ensuring that the effectiveness of a programme can be continually monitored, it also removes pressure from both the teacher and the student, as any problem is a task that needs to be analysed rather than being considered someone's fault. An example of a data collection form is shown in Table 3.3 below.

The student was observed throughout all phases during the baking of the scones. The percentage of steps performed correctly during baseline (prior to observing the video), intervention (after observing the video), generalisation (baking scones in another setting eg. Baking at Home) and then maintenance (baking scones a month after doing so) were recorded on a data collection form. If the student performed the steps out of order independently but correctly, the step was recorded as correct.

Permanent product data are reported as a number of items or a percentage of items resulting from behaviour. The percentage of correct responses is calculated by dividing the number of correct responses by the total number of responses and multiplying the result by 100.

$$\frac{\text{Number of correct responses}}{\text{Total number of responses}} \times 100 = \text{percentage of correct responses.}$$

When teaching skills you have to be organised to manage the process efficiently and to keep accurate and precise data showing progress toward mastery of the chain. The teacher will need a list of the steps to be taught and a way to mark correct or incorrect responses.

### **3.6.2 Data Collection Sheet.**

The data collection sheet is arranged for the task of baking scones. The response required for each step is written next to the number. The columns to the right represent the trial or opportunities for performance of the task. For each trial, the teacher records the accuracy of the student's performance of each step, using the simple circle and slash procedure or as in this sheet by noting an error by putting a slash through the step number and leaving untouched the step number for a correct response. This format allows for graphing directly on the sheet. The number corresponding to the number of correctly performed steps is indicated by placing a filled in circle in each trial the data sheet, indicates he correctly performed 6 out of the 30 steps on the first trial of the baking scones task analysis. He also correctly performed 21 steps correctly on trial 7, and 30 out of 30 steps on trial 17.

Data Collection Sheet - Baking Scones										
Name of Student:		Data Collection								
		Independent:		√						
Date of Birth:		Assistance given:		x						
Task Analysis	Trials									
	1	2	3	4	5	6	7	8	9	
1. Turn oven on to gas mark 6.										
2. Sieve Flour into bowl										
3. Put Sugar in bowl										
4. Put Margarine in bowl										
5. Make crumbs - Rub together using fingers										
6. Add milk and egg mix										
7. Mix ingredients in bowl using wooden spoon										
8. Make a dough ball										
9. Sprinkle flour on table										
10. Using knuckles knead mix into a ball										
11. Roll out ball using rolling pin										
12. Cut 6 scones using cutter										
13. Put scones on baking tray										
14. Dip brush in milk										
15. Brush scones with milk										
16. Open oven										
17. Put scones in oven										
18. Close oven door										
19. Bring dishes from table to sink										
20. Wipe down table using cloth										
21. Wash dishes										
22. Dry dishes										
23. Put away dishes										
24. Take scones out of oven										
25. Check scones cooked										
26. Put scones on wire tray										
27. Wash baking tray										
28. Dry baking tray										
29. Put away baking tray										
30. Put scones in basket for display										

Table 3.3: Sample Data Collection Sheet

### **3.6.3 Recording and Charting Results**

Microsoft Excel was used to record and chart (graph) the results of this study. Data graphing has been described in the sections below.

## **3.7 Graphing Data**

Data collection, as you can imagine, results in a collection of data sheets. For data to be useful, the contents of those sheets must be rearranged in a way that allows them to be easily read and interpreted. The most common method of arranging and presenting data is to use a graph. A properly drawn graph provides a picture of progress across the time of instruction or intervention. Graphs should be simple and uncluttered but provide sufficient information to monitor progress.

Graphs serve at least three purposes. Firstly, they provide a means of organising data during the data collection process. Tallies on sheets of paper or coded entries on data collection forms are difficult, if not impossible to interpret. Translation of raw data into a graph provides an ongoing picture of progress (or lack thereof) that is easier to understand than thumbing through piles of data sheets. Secondly, an ongoing picture makes possible formative evaluation, the ongoing analysis of the effectiveness of an intervention. Formative evaluation makes it possible to see how well a procedure is working and to make adjustments if it is not working well. When the intervention is finished, inspecting a graph allows for summative program evaluation, the end result of an intervention or series of interventions. Thirdly, graphs serve as a vehicle for communication among teacher, student, parents, and related service professionals. A properly constructed graph shows all the information about how the target behaviour changes during an intervention. One should be able to understand the graph without have to read a prose explanation. The information shown on the graph can be used to write and evaluate progress reports, individualised education programs, and behaviour management plans.

### **3.7.1 The simple line graph**

Line graphs are commonly used to display data in a serial manner across the duration of instruction or intervention. This allows for ongoing monitoring of the behaviour and evaluation of the instruction or intervention. Graphs can be constructed using Excel. The grid on the graph makes it possible to plot data accurately, ensuring proper alignment and equal intervals among data points. When data are presented formally, as in publications, the grid is usually omitted.

### **3.7.2 Axes**

A graph is constructed within a set of boundaries. These boundaries are called axes (axis singular). A line graph has two axes; the horizontal or x axis, and the vertical or y axis.

The x axis is the horizontal line that serves as the bottom boundary of the graph. It shows how frequently data were collected during the period represented on the graph. It may be labelled as, for example, days, dates, or sessions. The right boundary of the graph ends at the last session number. In this study the x axis shows the number of trials (at baking scones).

The y axis is the vertical line that serves as the left hand boundary of the graph. The label on the ordinate identifies that target behaviour and the kind of data that is being reported. In this study the y axis shows the percentage of correct tasks achieved when baking scones.

### **3.7.3 Conditions**

Conditions are phases of an intervention during which different approaches or techniques are used. A teacher who wanted to increase the occurrence of independent behaviour might first record the current level of the behaviour for several sessions –

baseline data. A strategy would be introduced to increase the student’s performance – intervention. You need a clear indicator on the graph of which condition is in effect during each trial. This is provided by drawing a vertical dashed line from the top to the bottom of the graph. This line is drawn between the lines on the graph between the last session of one condition and the first session of the next. For example, if baseline occurred for five sessions and intervention began on the sixth session, the condition line would be drawn between trials 5 and 6. Data points are not connected across conditions. To identify what procedure is represented, a brief, descriptive condition label is placed above the data path for each condition, centred between the vertical dashed lines. For example if a teacher is using video modelling to improve a student’s on task behaviour during reading, she would print ‘video modelling’ above the part of the graph on which these data are placed.

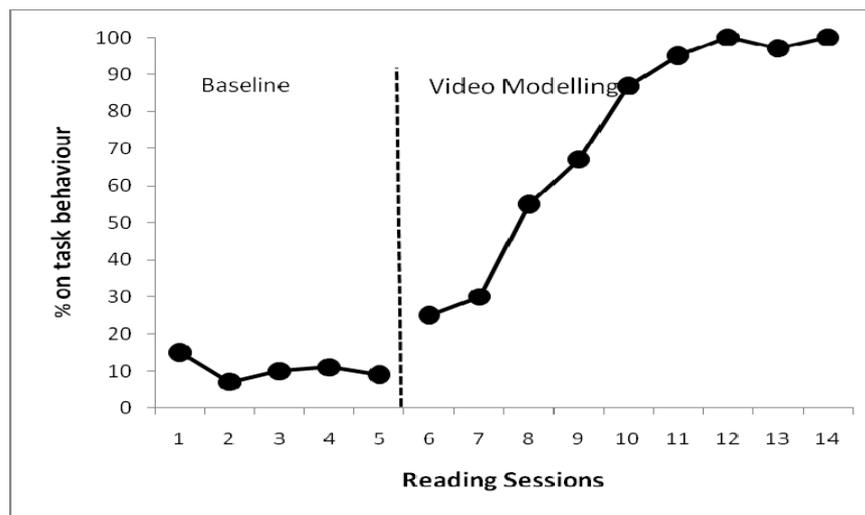


Figure 3.2: Baseline, Intervention – Condition dotted line.

### 3.8 Documentary Evidence and Triangulation

Throughout the study the student was observed and data was collected during each trial. All data was documented on the data collection sheet. Cohen et al. (2007) comments

that the attraction of documentary evidence is that they are considered factual and often an unobtrusive method of data collection.

The concept of triangulation of data as stated by Cohen et al. (2007) is, ‘the use of two or more methods of data collection in the study of some aspect of human behaviour’, (Cohen et al., 2007, p. 141). Without the process of triangulation, there would be questions over the reliability of data.

In order to triangulate the data for this research project, baseline, intervention, generalisation and maintenance data was taken. The pupil was observed at all times during the trials.

### **3.9 Ethical Considerations**

From the beginning, the purpose and nature of the study was communicated to the parents of the participants and to the school authorities, and their permission sought and acquired. It was made clear that no student would be identified by name and pseudonyms would be used throughout. It was explained to the students involved that the author was conducting a study to explore whether video modelling might be a useful method to teach students.

Berger and Patcher (1994) explain how research involving human participation, to be truly ethical needs to be voluntary. According to Bell (2005) informed consent requires careful preparation that considers explanation of the study and consultation before data is collected. To begin with informed consent begins the process by addressing the following (1) that the subjects are competent in giving their consent. (2) The subjects are given adequate knowledge about the study and (3) that their consent is voluntary. (Berger and Patcher, 1994)

To ensure such guidelines are adhered to a letter is sent to participants seeking among other things permission or consent to undertake the study. In this case the peer model and the student with autism were issued with a letter which was seeking their help in this case study and consent of parents was sought (Appendix A). The members involved returned the letters signed with parental consent. The Principal (Appendix B) in the school was approached for his support in the case study and this was granted.

### **3.9 Conclusion**

The purpose of this project was to confirm that an individual with autism may not only acquire, but generalise and maintain, baking scones after observing a model demonstrating doing so. In this particular case, the modelled task was presented via video. Video modelling was used to teach the student with autism to bake scones at school. Generalisation was assessed where the student baked scones at home. Maintenance of the skill was also assessed one month later at school following acquisition of the skill of baking scones. Data on the baseline, intervention, generalisation and maintenance phases was graphed using excel. Research findings are discussed in Chapter 4.

## **Chapter 4 Research Findings**

### **4.1 Introduction**

This chapter presents the findings of the research study. The data was obtained by observation of a student in a home economics class baking scones. Initially the student was observed following written directions on how to bake scones. Baseline data was collected at this point. An assistant was on hand where necessary to help when the student was unsure of what to do. The first 5 times the student baked scones data was recorded as baseline data. Following this the student was shown a video of a peer baking scones. This intervention is known as video modelling. Following the intervention the student baked scones 9 more times. This was known as the intervention phase. The student was observed and data was collected during this intervention phase. Following the acquisition of the skill, the student was observed and data was collected during the generalisation and maintenance phases. The findings are presented below in the relevant phase (baseline, intervention, generalisation, and maintenance).

### **4.2 Case Study**

For this research project it was decided to use a single subject design. Professionals working with students with autism prefer to use single subject designs (Dunlap and Kern, 1997). Single subject designs provide structures for evaluating the performance of individuals rather than groups. By using a single-subject design it makes it possible to identify the effects of the intervention (video modelling) on a specific behaviour (independent skills) of a particular student. This design monitors the performance of the individual.

Single-subject designs require repeated measures of the dependent variable. In this research project the student was observed baking scones following written instructions in order to get baseline data. Data was recorded on a weekly basis for five trials. By using single subject design the individual's performance can then be compared under different experimental conditions, or manipulations of the independent variable. The individual is compared only to himself. Single subject research emphasises clinical significance for an individual rather than statistical significance among groups.

Following the baseline phase, the intervention was introduced. In this case the intervention was where the student watched a video modelling DVD of a peer baking scones. Using a single subject case study if an intervention results in an observable, measurable improvement in functioning, often referred to as enhanced functioning, the results of the experiment are considered to have clinical significance. The intervention phase was followed by a generalisation and maintenance phase.

For this project a case study was deemed the most appropriate research method. Case studies focus on evaluation elements or intervention elements from which deductive conclusions may be drawn for intervention or changes in intervention methods. This research method involves a great deal of observation and careful study of the presenting condition viewed within whatever context is deemed appropriate. In the case of this project the student is observed baking scones. For every task he can complete independently it is recorded.

## **4.3 Description of Participants**

### **4.3.1 The Student**

The student who participated in the study has autism and a mild general learning disability. He relies heavily on his assistant when in mainstream classes. The student is

extremely prompt dependent and waits to be told what to do instead of using his own initiative. He has been attending home economics class for the past three years and still needs to be shown what to do during every class. Tasks that you would imagine that he should be able to do at this stage still need to be demonstrated weekly – washing up, wiping down the table. During the practical class the student is usually in a group with peers which can be distracting. It is also a very noisy class. During this research project the student worked independently with the help of the assistant when required. There were other students working in the class when the student was being observed baking scones. During the home economics practical exam there will be other students in the class and each student will be working independently so it was important that the student participating in the study learned the task in these conditions.

#### **4.3.2 The Special Needs Assistant**

The SNA has been accompanying the student to home economics class for the past three years. She feels while he enjoys the practical class the student needs a lot of assistance during the class and is very slow to do things on his own initiative. The SNA feels that if the student is to do the practical home economics exam that he needs to be much more independent. One of the roles of the SNA is to help students to improve their independent living skills. While the student is participating in lots of independent living skills (washing and drying dishes, using an oven, boiling a kettle, following recipes) on a weekly basis in the home economics class he does not seem to be retaining these skills. The student is unable to complete simple tasks independently.

#### **4.3.3 The peer (Video Model)**

A peer was used to model in the intervention video for this research assignment. Peers make very effective models when teaching students with autism. Peer modelling has been a long standing practice in educational settings, so the fact that using peers as models has achieved an important status in video modelling studies comes as no surprise (Taylor et al., 1999). The student selected to participate in the video is in the student's mainstream home economics class and will be completing a practical exam in

home economics also. He is extremely familiar with the skills required to bake scones. The researcher watched the peer bake scones in order to produce the task analysis required to bake scones successfully. Each task was recorded on camera and made into a video. This video was then used in the intervention. The student watched the video of the peer baking scones. Peer modelling would be seemingly advantageous to adult modelling because students are most likely to attend to a model similar to themselves in some way (Bandura, 1977).

The participant enjoyed watching his peer on the DVD. The peer somewhat resembled the participant – he was male, tall with dark hair similar to the participant. Initially the participating student asked was that him on the DVD, he was told it wasn't him. The participating student enjoyed watching the DVD and never objected. He concentrated and focused on the screen at all times and rarely had to be reminded to attend.

#### **4.4 Setting for the Research**

The baseline, intervention and maintenance phases of the research took place in the home economics room in the school. The student uses this room every week during the practical home economics class. He is familiar with the equipment in the room – baking equipment, cookers, sinks etc. The DVD was recorded in the home economics room in the school. The equipment used in the DVD is similar to that used by the student during the practical home economics class. The generalisation phase took place in the student's home. Research was carried out during the period September 2009 to January 2010.

#### **4.5 Baseline Phase**

Baseline data was collected throughout the month of September 2009. The student was observed baking scones on five occasions throughout the month. Baseline data was

recorded on a data sheet. The student was given a list of clearly typed instructions to follow in order to bake scones. The verbal instruction ‘Bake scones’ was used to alert the student to begin the task of baking scones. Ten seconds were allowed per step. If the student did not respond within ten seconds the assistant helped complete the next step of the task so the student would have the opportunity to complete each subsequent step of the task. The student was reminded of the task if he became distracted from the task. During baseline, no feedback or prompts were given to the student but if an error prevented the completion of the next step of the task the assistant corrected the error.

The student continued baseline sessions until his data was judged to be visually stable. The student’s data was stable from the beginning in that he could complete 6 or 7 out of the 30 tasks from the task analysis ‘Baking scones’ independently. The purpose for establishing a baseline was to assess the student’s performance in the absence of the video modelling intervention. This would provide an objective method for evaluating the effects of the video modelling training.

#### **4.5.1 Baseline Results**

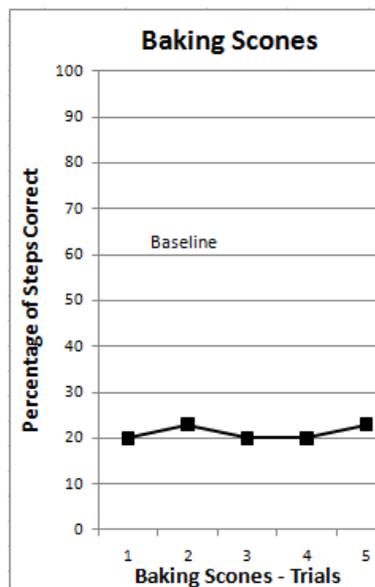
During the baseline data collection the student was able to do 6 or 7 out of the 30 tasks independently. The assistant helped complete the tasks the student was unable to complete. The tasks were recorded on a chart and calculated as a percentage of steps the students did correctly and independently as shown in Table 4.1 below.

Trial Number	Steps completed independently.	% of steps completed independently.
1	6/30	20%
2	7/30	23.333’%
3	6/30	20%

4	6/30	20%
5	7/30	23.333%

*Table 4.1: Baseline Data*

The data was then entered into Microsoft Excel where a graph was produced. See Figure 4.1 below.



*Figure 4.1: Baseline Graph*

The student was able to complete 6 tasks independently on 3 trials and 7 tasks independently on 2 trials. The tasks the students completed independently included:

Task 2 – Sieve flour into bowl.

Task 3 – Put sugar into bowl.

Task 4- Put margarine into bowl.

Task 6 – Add milk and egg mix.

Task 16 – Open oven

Task 17 – Put scones in oven

Task 18 – Close oven door (this was completed independently during trial 2 and 5).

#### **4.6 Intervention Phase- (Video Modelling)**

The student was required to watch a video of a peer baking scones. The peer was filmed baking scones in the same training setting where the student was required to bake scones. On the videotape the peer was viewed baking scones using the same utensils as the student would use when he was baking scones. If the student became distracted when watching the video, he was reminded to watch the video and was praised for viewing. After viewing the video, the student was then told to ‘bake scones’.

For each step the student completed correctly and independently, the assistant praised him with verbal praise that was specific to each step (e.g. well done adding the sugar to the bowl). The student was given 10 seconds to perform each step. If the student did not respond within the given time, the assistant helped to complete the task. If the student made errors during the training trials, no corrective feedback was delivered, but if an error prevented the completion of the next step, the assistant corrected the error. If the student didn’t complete 100% of the steps independently during practice, the video was viewed again. The intervention continued until the student performed 100% of the steps correctly during three consecutive sessions.

##### **4.6.1 Intervention (Video Modelling) – Results**

After the student watched the video of a peer baking scones he then was instructed to ‘Bake Scones’. The student was observed baking scones and data was collected. Every task the student completed independently was recorded on the data sheet. Following

viewing of the video the student dramatically increased the number of tasks he could complete independently. At baseline before intervention the student could complete 7 out of 30 tasks independently. Following intervention the student completed 19 out of 30 steps independently.

During the intervention phase the student observed the video of the peer baking scones before he baked scones. The student enjoyed watching the video and was focused on the screen. The student was aware that he would be baking scones after watching the video which was an extra incentive for him to attend to the video.

Trial Number	Steps completed independently.	% of steps completed independently.
6	19/30	63.333’%
7	21/30	70%
8	23/30	76.666’%
9	24/30	80%
10	26/30	86.666’%
11	29/30	96.666’%
12	30/30	100%
13	30/30	100%
14	30/30	100%

*Table 4.2: Intervention Data*

The number of tasks the student was able to complete independently increased after each viewing of the video. There were steps that he completed incorrectly during the baseline trials that he later performed correctly following intervention where he viewed the video model. Specifically, he was unable to mix the flour and margarine together independently but did so following the intervention. Likewise, he was unable to roll out the pastry but did so independently following the intervention.

On trial number 10, 5 trials after watching the DVD the student completed 26 steps out of 30. After 7 trials following the intervention (watching the DVD) the student completed 30 out of 30 steps independently. The intervention continued until the student completed 100% of the steps correctly during 3 consecutive intervention sessions. The data was then entered into Microsoft Excel where a graph was produced. See Figure 4.2 below.

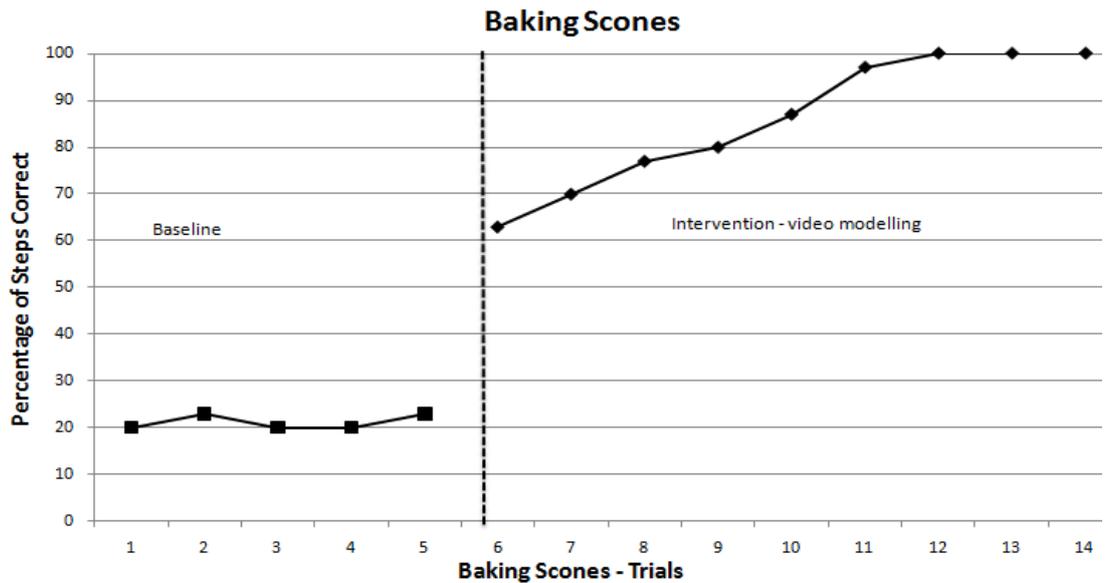


Figure 4.2: Intervention Graph

#### 4.7 Generalisation Phase

An important aspect of any programme is the assessment for generalisation. That is, once an intervention has produced the desired changes in the target behaviour then an additional assessment takes place in the absence of the intervention to determine whether the behavioural change is permanent and generalises to other situations. In this situation the student had completed 3 trials in school successfully where he completed 100% of the tasks independently.

#### 4.7.1 Generalisation Results

To generalise it was decided to see if the student could generalise the task of baking scones at home. The student was visited in his home on Tuesday the 8<sup>th</sup> of December to observe him baking scones. The special needs assistant also came along to help out if needed. An area was set up in the kitchen for baking similar to the situation the student would use in school. We used baking equipment from his home. The student was observed baking scones and data was collected on the data sheet.

The first generalisation trial was not as successful as envisaged. The student completed 22 out of 30 steps. This was disappointing as the student had completed 3 trials 100% independently. However a couple of days later on Saturday 13<sup>th</sup> of December the student was observed baking scones in his home and he completed 100% of the steps independently.

Trial Number	Steps completed independently.	% of steps completed independently.
15 Generalisation 1	22/30	73.333%
16 Generalisation 2	30/30	100%

*Table 4.3: Generalisation Data*

The data was then entered into Microsoft Excel where a graph was produced. See Figure 4.3 below.

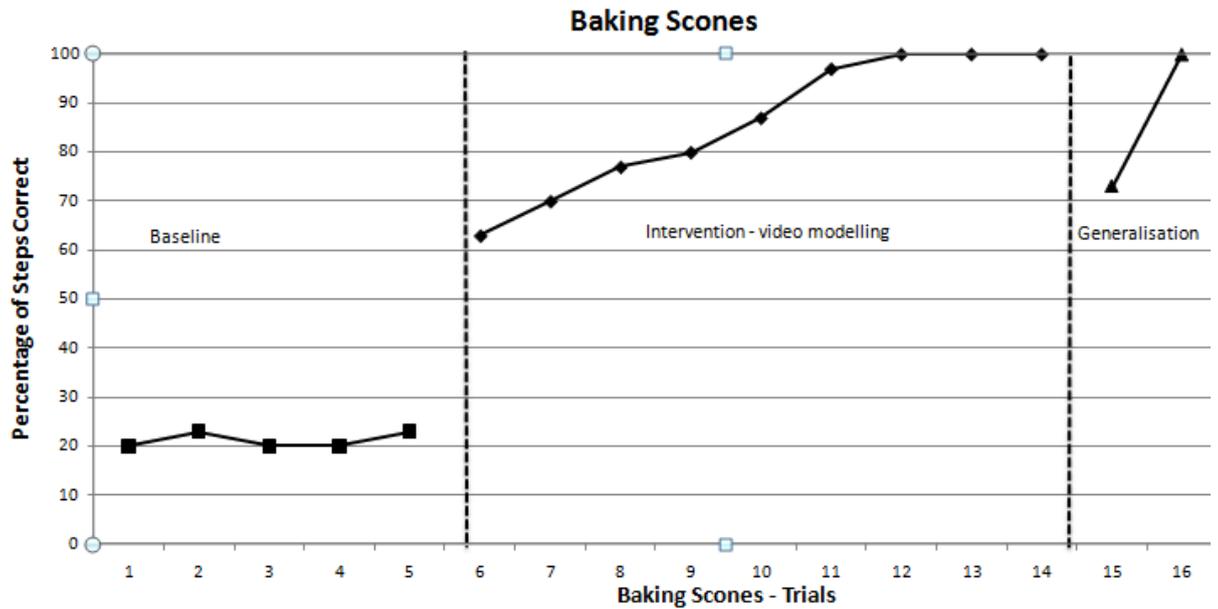


Figure 4.3: Generalisation Graph

During the first generalisation trial the student may have been over excited to have staff from school in his home. This may have been the reason that some of the steps were not completed independently. The student watched the video of the peer baking scones prior to baking scones during the second generalisation trial and was able to complete the task 100% successfully then.

#### 4.8 Maintenance Phase

Most things that teachers want students to perform should occur even after intervention procedures have been withdrawn. This continued performance over time is maintenance. Ensuring that behaviour will be maintained is an important part of teaching. It is impossible for the teacher to follow students around forever checking to see if they remember what they learned.

### 4.8.1 Maintenance Results

To see if the student maintained the skill of baking scones he was observed baking scones a month following his last trial. The student was observed baking scones in the home economics room in the school. Data was recorded on a data sheet. The student completed the tasks 100% independently during both trials.

Trial Number	Steps completed independently.	% of steps completed independently.
17 Maintenance 1	30/30	100%
18 Maintenance 2	30/30	100%

Table 4.4: Maintenance Data

The data was then entered into Microsoft Excel where a graph was produced. See Figure 4.4 below.

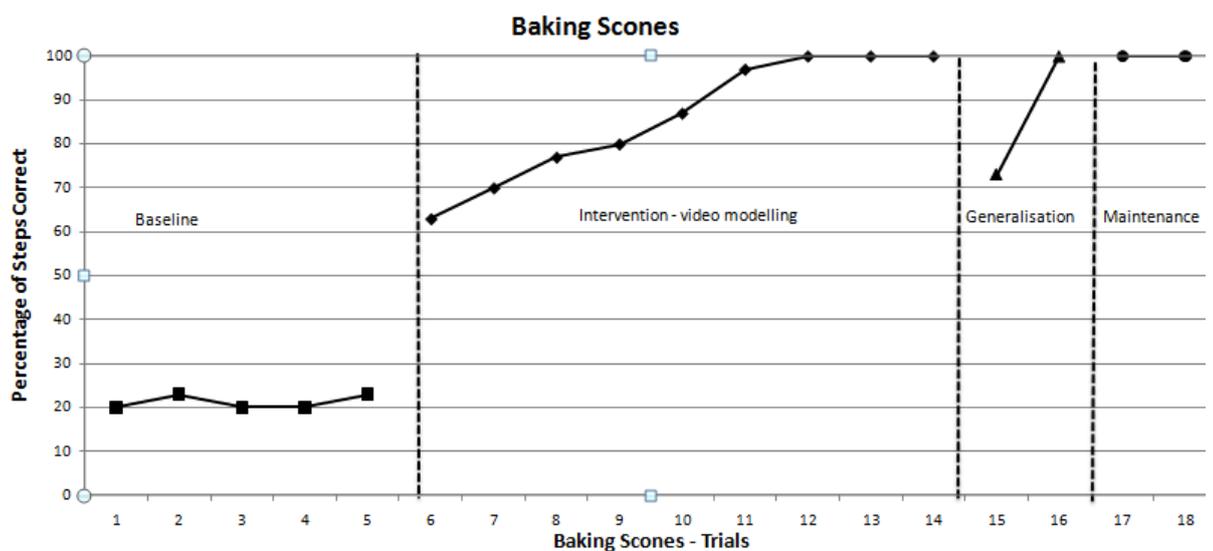


Figure 4.4: Maintenance Graph

## **4.9 Conclusion**

This chapter presents the findings of the research by phase (baseline, intervention, generalisation and maintenance). Results reveal that the intervention of video modelling increased this student's ability to bake scones independently. Baseline data showed that the student found it difficult to do the task independently. Following the intervention of video modelling the student's independent skills increased considerably. After repeat viewing of the intervention the student was able to do the baking task 100% independently. Generalisation of the task was quite successful where the student completed the task 100% independently on the second trial. Maintenance of the task took place a month later and the student again completed the task 100% independently. It is the purpose of the next chapter to discuss the implications of such findings in light of current literature.

## **Chapter 5 Discussion of Findings**

### **5.1 Introduction**

In chapter 4, the findings from this research were produced which were based on data obtained from observation. The main research question examined whether the use of video modelling can help to teach a student with autism. This chapter presents the discussion of findings of the research study. According to Morgan (2005), the purpose of the discussion chapter is to discuss how these findings fit into the existing body of knowledge. Is there a consistency with the existing knowledge or are new insights presented?

### **5.2 Baseline**

Baseline data was collected throughout the month of September 2009. The student was observed baking scones on five occasions throughout the month. Baseline data was recorded on a data sheet. During the baseline data collected showed the student was able to do 6 or 7 out of the 30 tasks independently. The tasks were recorded on a chart and calculated as a percentage of steps the students did correctly and independently. These results were entered into Microsoft Excel and a graph was formed.

During the baseline phase the student was following written and verbal instructions. When the student was unable to complete a task the assistant demonstrated to him how to complete the task. The verbal, written instructions and the demonstration by the live model (the assistant) were inadequate to help the student learn the task. During baseline he baked scones on five different occasions but each time did not seem to progress very far – completing six or seven steps independently during each trial. Even though the

student was shown how to do the other steps he was unable to complete these steps the next time he was instructed to do so. After five trials there was little improvement in skill acquisition which demonstrated the need for an intervention.

### **5.2.1 Visual Learners**

Students with autism are visual learners and often need visuals in place to help them learn. The assistant would have been using language when describing what the student should be doing in each step. The student was partaking in a practical home economics class with twenty other peers. He often became distracted by other students around him and the noise in the class. The distraction of the other students along with the language used by the assistant hindered him in his progression with the tasks required.

Hodgdon (1999) found that students on the autistic spectrum do not understand their world very well: “They tend to be visual learners living in a very auditory world” (p. 65). The use of visual strategies can help rectify the situation and make better sense of the world around them for these students.

Following baseline results it was decided to use a visual strategy to help the student to complete the task of baking scones. The use of visual systems can strengthen the student’s understanding of the communication in his/her environment (Peeters, 1997; Quill, 1997).

Using visual environmental supports to mediate communication interactions and support understanding provides a nontransient foundation essential for more effective communication. It builds on children’s strengths rather than placing more demands on their area of greatest difficulty. When visual supports are used to give these children information and direction, child comprehension increases significantly. (Hodgdon, 1995b, p. 268)

The visual intervention the researcher decided to implement was video modelling. Video modelling, defined as the viewing of a videotape of a peer or instructor successfully performing a task (LeGrice and Blampied, 1994), has been shown to be one effective strategy for developing functional skills. Typically, an individual is asked to view the videotape at the beginning of an instructional session and to then attempt the task independently. Video modelling has proven to be an effective intervention for teaching a variety of skills to persons with developmental disabilities (Charlop and Milstein, 1989).

### **5.2.2 Baseline Research**

Charlop and Milstein (1989) developed a video modelling paradigm to teach conversational speech to children with autism. Conversational scripts were created based on specific objects, such as toys or books. Each conversation consisted of 6 lines, 3 each for the experimenter and child. Each line consisted of two parts; an answer and a question. These conversations were spoken by the children's therapists and videotaped for later modelling. During baseline, all participants displayed very low frequencies of correct conversational speech. The children then viewed the videotape of the scripted conversation. Following video modelling, all children met criterion and learned conversational speech, and such responding generalised to different conversational partners, and to other, untrained topics. Importantly, response generalisation also occurred. The children in the study were visual learners and responded well to the video modelling. The baseline results in the study above are consistent with the results in the research study 'baking scones'. The students did not improve during baseline but following video modelling there was huge improvement in conversational speech.

A study by Cihak et al. (2010) evaluated video modelling delivered via a handheld device (video iPod) to assist students to transition (move) between locations and activities within their school. Four students with autism learned to manipulate a handheld device to watch video models. Overall, the mean number of independent

transitions made by students during baseline was 7%. When students used the handheld video device during intervention, ascending trends were observed and the mean percentage of independent transitions increased to 77%. The baseline results in this study compare favourably to the results of the research study 'baking scones'. In the study by Cihak et al. found that following the video modelling intervention there was a huge increase in the independence of the students. Prior to the study, students required consistent teacher assistance to transition successfully from place to place.

### **5.3 Intervention**

The student was required to watch a video of a peer baking scones. The peer was filmed baking scones in the same training setting where the participating student was required to bake scones. After the student watched the peer baking scones he then was instructed to 'Bake Scones'. He was observed baking scones and data was collected. Every task the student completed independently was recorded on the data sheet. Following viewing of the video the student dramatically increased the number of tasks he could complete independently.

At baseline before intervention he could complete just 7 out of 30 tasks independently. On the first trial following intervention he completed 19 out of 30 steps independently. The number of tasks he was able to complete independently increased after each viewing of the video. There were steps that he completed incorrectly during the baseline trials that he later performed correctly following intervention where he viewed the video model. Seven trials following the video modelling intervention the student completed 30 out of 30 steps independently. The intervention continued until the student completed 100% of the steps correctly during 3 consecutive intervention sessions.

After just one viewing of the video modelling DVD the student showed huge improvement in skill acquisition. It was obvious that the visual intervention was

extremely successful in this instance. After just 7 trials he was able to complete the multi step task of baking scones 100% independently.

### **5.3.1 Intervention Research**

In 2005 Sigafos et al. evaluated the use of a video modelling procedure for teaching three adults with developmental disabilities to make popcorn using a microwave oven. Training, using a 10-step task analysis, was conducted in the kitchen of the participant's vocational training program. During baseline, participants were instructed to make popcorn, but were given no further instructions or prompts. The baseline results showed that the adults were able to complete 0-3 of the steps during the 6 baseline sessions. Video modelling consisted of first watching a video clip of the steps being performed and then giving participants the opportunity to imitate the steps. When video prompting was introduced, the adults showed an immediate increase in the percentage of steps performed correctly and reached 100% within five to nine sessions. This data suggests that video modelling may be an effective instructional strategy for teaching daily living skills to adults with developmental disabilities.

The findings from the study above replicated those of this researcher. Using video technology is an effective and often rapid treatment approach for some students with autism. The purpose of this research was to assess the effect of an instructional video modelling technique in facilitating learning in a student with autism. There was a clear demonstration that for the student in this research, correct responding on acquisition tasks greatly improved after video viewing. Consistent with prior research, the data suggest that video is a useful medium for accomplishing positive behaviour change in this population (Charlop and Milstein, 1989; Schreibman, Whalen, and Stahmer, 2000). The presentation of the instructional video modelling intervention resulted in rapid skill acquisition for this student.

## 5.4 Generalisation

An important aspect of any programme is the assessment for generalisation. That is, once an intervention has produced the desired changes in the target behaviour then an additional assessment takes place in the absence of the intervention to determine whether the behavioural change is permanent and generalises to other situations.

To program meaningful behaviour change, teachers must use the behavioural principal of generality. Baer, Wolf and Risley (1968), stated “A behavioural change may be said to have generality if it proves durable over time, if it appears in a wide variety of possible environments, or if it spreads to a wide variety of related behaviours (p.96).” Baer and his colleagues describe three ways a behaviour may show generality: over time, across settings and across behaviours.

In this study the student had completed 3 trials in school with 100% success where he completed all of the tasks independently. To generalise it was decided to see if the student could generalise the task of baking scones in another setting. The researcher visited the student in his home to observe him baking scones. The special needs assistant also came along to help out if needed. An area was set up in the kitchen for baking, similar to the situation the student would use in school. We used baking equipment from his home.

The first generalisation trial was not as successful as envisaged. The student completed 22 out of 30 steps. The reason the trial may not have been so successful may have been due to school staff visiting the student in his home – this would never have happened prior to this. The student appeared over excited in the situation.

Although the student did not demonstrate generalisation immediately following mastery, only one additional training session was necessary for him to do so. A couple of days later on Saturday 13<sup>th</sup> of December the student was observed baking scones in his home and he completed 100% of the steps independently. These findings are consistent with the findings of Lasater and Brady (1995), where a treatment package consisting of video modelling and verbal praise was sufficient in establishing generalisation across settings. Four individuals with Traumatic Brain Injury received instruction in cooking. They watched videotapes of themselves cooking and practiced that skill while receiving prompts and feedback. Treatment effects were evaluated by comparing performance before, during and after training and at a 2 and 4 week follow-up. Additionally, cooking performance on a novel food item was examined. The individuals also substantially maintained their skills 2 and 4 weeks following training and generalised their skills to a novel food item.

## **5.5 Maintenance**

Maintenance is the ability to perform a task over time without re-teaching. Maintenance is confirmed when the teacher rechecks the skill to be sure the student can still do it. To see if the student maintained the skill of baking scones he was observed baking scones a month following his last trial. The student was observed baking scones in the home economics room in the school. He completed the task 100% independently during both trials.

### **5.5.1 Maintenance Research**

In the research articles studied, maintenance of the learned skill was checked after a period of time following video modelling intervention. Shipley-Benamou et al. (2002) taught daily living skills to three children with autism using video modelling. The skills taught included table setting, mailing a letter, squeezing orange juice. All three children

maintained the skills learned during a 1-month follow up. A high level of maintenance after learning the new skills using video modelling was shown.

The maintenance results completed during the research compared favourably with the findings of Bidwell and Rehfeldt (2004). They assessed whether three adults with severe learning disabilities would acquire a domestic skill (making coffee) with an embedded social skill (serving coffee to and sitting down beside a peer) via video modelling procedures. Training was conducted in a classroom in the participants' day treatment setting. The intervention consisted of (i) watching a video of an adult with a developmental disability making coffee and initiating a social interaction with a peer; and (ii) receiving verbal praise for each step of the task that was performed correctly. All three participants mastered the task and demonstrated generalisation across settings, stimuli, and people. Two participants performed with 100% accuracy on maintenance trials conducted 1 month following mastery, and one participant did so following booster training.

## **5.6 Why video modelling is so effective for Individuals with Autism.**

The effectiveness of video modelling may be attributed to the fact that video modelling integrates an effective learning modality for students with autism (visual instruction) with a well studied intervention technique (modelling). This notion is supported by Sherer et al. (2001), who noted that video modelling was most effective for the children in their study who enjoyed watching people on video, and who demonstrated prior preference for visual learning, such as video viewing and the use of visual support strategies. The student used in the research 'baking scones' enjoys watching videos and is a visual learner which further supports why video modelling was such a success towards his learning in this study.

In addition to capitalising on the effectiveness of visual instruction, there are a number of other factors that make video modelling effective interventions for students with autism. As Bandura theorized (1965), attention is a necessary component of modelling. That is, a person cannot imitate the behaviour of a model if the person does not attend to the model's behaviour. The use of video modelling allows the teacher to remove irrelevant elements of the modelled skill or behaviour through video editing. The removal of irrelevant stimuli allows the individual with autism to better focus on essential aspects of the targeted skill or behaviour. When recording the 'Baking scones DVD' the researcher edited the irrelevant details from the video. The student was able to focus on the targeted skills needed to complete tasks.

Charlop-Christy et al. (2000) compared video modelling and live modelling for teaching students with autism. They attributed the positive gains observed in their study to the fact that students with autism attended more closely to the video model compared to the live model. This can be reflected in the current research during baseline when the participating student observed a live model completing a skill e.g. rolling out the dough. Even after watching the live demonstration the student was unable to repeat this skill in the next baseline trial. Following the observation of the video modelling DVD the student acquired the skills much faster.

Some individuals with autism may exhibit anxiety and distress related to social interactions with people (Bellini and Akullian , 2007). This anxiety may significantly impact their ability to attend to a learning task. Video modelling can be implemented with minimal human interaction, thereby reducing much of the distress and anxiety related to social interactions.

Motivation could be another factor contributing to the success of video modelling interventions. Watching videos is a highly desired activity for many students with and without autism, leading to increased motivation and attention to the modelled task. In

video self model (where the student is the model) motivation to watch oneself on the video may be enhanced by the portrayal of predominantly positive and successful behaviours (Dowrick, 1991) - which may also increase attention (Bandura, 1967).

## **5.7 Limitations of Video Modelling**

Video modelling appears to be effective but there are some limitations to consider. This research was limited to the study of one student. This was helpful because it enabled the researcher to focus on the student's progress and his reactions to techniques of video modelling when it was introduced. Next, it would be interesting to undertake related research such as: Do other students with autism react and engage with video modelling in the same way?

Some practical issues may affect its use, including access to video equipment and the time required for video preparation. It took a couple of days to make the video used for this research assignment. However, other visual strategies (e.g., picture schedules) also require preparation time.

Another limitation involved in the production of the videos stems from filming from the participants' perspective. Given the desire to minimise extraneous stimuli on the videos (e.g., showing more than just the hands of the model), it may be necessary to select tasks that have minimal spatial requirements and limited gross motor movements.

A possible drawback in using the video modelling technique relates to the lack of exposure to typical peers involved in the live modelling process. The benefit of using typical peers as models is that this often creates opportunities for socialisation or social benefits in addition to modelling effects. This may represent a deficiency of video modelling, as opposed to in vivo (live) modelling techniques, in general.

A significant feature, which may have contributed to the success of the present research, was the prerequisite skills required for participation in the research. Prior to the intervention, the student demonstrated an ability to imitate a model, attend to a preferred task for up to 5 minutes, and follow one- and two-step directions, and the student possesses strengths as a visual learner. Many individuals with autism may not display the same rapid acquisition rates as the participant in this research if they are unable to demonstrate prerequisite skills.

## **Conclusion**

The results of this research suggest that video modelling may offer a positive and relatively simple intervention for students with autism. Certainly, this method offers several advantages over traditional interventions used for children with autism (Buggey et al., 1999). Video modelling is technologically friendly and can readily be learned by parents, teachers, and clinicians. It also has the benefit of relatively rapid results. There is a vital need for teaching tools that are specifically designed for individuals with autism to help foster their skill acquisition through typical modalities. Video modelling appears to be an option deserving of future investigation because of its child-friendly and cost- and time-efficient properties.

Future research could examine the use of video modelling in a variety of areas beyond food preparation such as self-care, social, vocational and communication skills. If successful, this approach could be used by professionals from various disciplines including physical, occupational and speech therapists as well as vocational counsellors. Research could also be conducted to evaluate the effects of video modelling alone (i.e. without the use of prompts and feedback). If such a simple training package is effective, it could be implemented by staff with little specialised training.

## **Chapter 6: Conclusion**

### **6.1 Introduction**

Research on video modelling as an instructional approach for individuals with autism has been found to be a promising area for teachers and researchers. Over the last three decades the literature has shown successful use of video modelling for teaching a variety of social, academic and functional skills to students with autism. The purpose of this study was to examine the potential impact of video modelling on the teaching and learning of a student with autism.

### **6.2 Summary of Findings**

This study used video modelling to teach a student with autism to bake scones. The student is doing home economics in the Junior Certificate in June. There is a practical part of the exam which the student will complete in April. For the practical exam the student needs to be able to complete the baking task independently. Live demonstration by the Special Needs Assistant during class had not proved effective in teaching the student the skills required to complete the task independently. It was decided to try an intervention known as video modelling.

Prior to introducing the video modelling intervention, baseline data was taken. It was important to take baseline data so that data can be compared before and after intervention to reveal if the student made any improvement. Baseline data revealed little improvement in skill acquisition. The intervention was introduced and the student observed the video modelling DVD of a peer baking. Following the intervention the student showed a huge improvement in skill acquisition. The improvement in skill acquisition increased until the student demonstrated 100% independence in the baking

skill. This data revealed that the use of video modelling and feedback was an effective instructional technique to teach a baking skill to the student.

To see if an intervention has worked to teach a skill, it must be seen if the student can generalise the skill to other environments. Generalisation of the baking skill was examined in a different environment than where the training took place. Again the student proved that he had acquired the baking skill where he demonstrated 100% independence during the second generalisation trial.

Maintenance is the ability to perform a task over time without re-teaching. To test if the student still had the ability to perform the baking task he was observed baking a month following the generalisation phase. The student demonstrated 100% independence in completing the baking skill.

This research project aimed to examine the potential impact of video modelling on the teaching of a student with autism. The results of this study revealed that the use of video modelling and feedback was an effective instructional technique to teach a baking skill.

### **6.3 Issues emerging from the Research**

Video modelling appears to be effective in this particular project but it is important to consider some issues emerging from the research. The research project was limited to the study of one student. This was helpful because it enabled the researcher to focus on the student's progress and reactions to techniques of video modelling when it was introduced. It would be interesting to undertake related research to determine whether other students with autism react and engage with video modelling in the same way as this student.

Some practical issues may affect the use of video modelling, including access to video equipment and the time required for video preparation. A couple of days were required to make the video used for this research assignment. Another limitation involved in the production of the videos stems from filming from the participants' perspective. Given the desire to minimise extraneous stimuli on the videos (e.g., showing more than just the hands of the model), it may be necessary to select tasks that have minimal spatial requirements and limited gross motor movements.

A significant feature, which may have contributed to the success of the present research, was the prerequisite skills required for participation in the research. Prior to the intervention, the student demonstrated an ability to imitate a model, attend to a preferred task for up to 5 minutes, and follow one- and two-step directions. The student also possesses strengths as a visual learner. Many individuals with autism may not display the same rapid acquisition rates as the participant in this research if they are unable to demonstrate prerequisite skills.

A possible drawback in using the video modelling technique relates to the lack of exposure to typical peers involved in the live modelling process. The benefit of using typical peers as models is that this often creates opportunities for socialisation or social benefits in addition to modelling effects. This may represent a deficiency of video modelling, as opposed to in vivo (live) modelling techniques, in general.

## **6.4 Future research applications**

Future research could examine the use of video modelling in a variety of areas beyond baking such as self-care, social, vocational and communication skills. If successful, this approach could be used by professionals from various disciplines including physical,

occupational and speech therapists as well as job coaches. Research could also be conducted to evaluate the effects of video modelling alone (i.e. without the use of prompts and feedback). If such a simple training package is effective, it could be implemented by parents, teachers, clinicians and carers with little specialised training.

Video modelling is technologically friendly and also has the benefit of relatively rapid results. There is a vital need for teaching tools that are specifically designed for individuals with autism to help foster their skill acquisition through typical modalities. Video modelling appears to be an option deserving of future investigation because of its student friendly and cost and time efficient properties.

## **6.5 Conclusion and Recommendations**

This research has highlighted the benefit of using video modelling in this particular case study with a student with autism. The limitations of applying this case study to all students with autism have also been explored. In addition the limitations of video modelling as a teaching method have been discussed. However it is important to conclude this study highlighting possible future research which might benefit other students with autism in the context of the Irish educational system.

While this study has been limited to one student, the research literature suggests (Baron-Cohen, 2004; Alcantara, 1994) that many students with autism have benefitted from the use of video modelling to develop new skills. Much of this research has been conducted in other countries and in particular in the USA. It would be interesting to examine video modelling further in the context of the Irish educational system. The recent introduction of Specialised Units for Students with Autism in schools today would provide an appropriate environment and facilitate these investigations and studies. If such studies were successful, wider implementation and application to

demonstrate self-care, social, vocational and communication skills in schools, could be considered.

## **6.6 Concluding Comment**

The student just completed his Mock home economics Practical. He received a score of 95% in the practical exam – the second highest result in a class of 20 students. He is the only student in the class with a learning disability. The home economics teacher wants to introduce video modelling for the rest of the class!

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## Appendices

### Appendix A – Consent Letter to Parents

Dear Parent/Guardian,

I am conducting a post graduate research thesis in the area of Digital Media Development for Education.

The title of my thesis is “The potential impact of video modelling on the teaching of a student with autism”.

As part of the research, it will involve students being filmed or observed during the home economics practical class.

I would be grateful if you complete the following consent form.

Thanking you in advance,

---

Ruth O’Brien

---

Do you allow your child to take part in this study?

Yes

No

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

## **Appendix B – Research Letter to School**

Dear Principal,

As you are aware, I am conducting a post graduate research thesis in the area of Digital Media Development for Education.

The title of my thesis is “The potential impact of video modelling on the teaching of a student with autism”.

It is proposed that my research will involve some 3<sup>rd</sup> year students in the school. There will be periods of filming and observation of students during the home economics practical class. With regards to confidentiality and anonymity, please be assured that strict guidelines will be adhered to at all times.

I would truly appreciate it if the school can assist me in this study.

Thanking you in advance,

---

Ruth O’Brien

## **Appendix C – Video Modelling DVD**

A model was filmed baking. The participating student viewed this model during the intervention phase of the research project.

- The video is available to view on the accompanying DVD. (Real Player required).
- Place CD-Rom in drive.
- Choose play DVD.