Review

Identifying the interactive communication ability of children with profound and multiple learning disabilities: The intensive interactive approach

Kholood Mohammed ALjaser (PhD Student)

School of Education, The University of Sheffield, United Kingdom

Many researchers have indicated the potential positive outcome of using Intensive Interaction (II) as an educational approach to identify communication and sociability skills (referred to in this article as Interactive Communication) in children with profound and multiple learning disabilities (PMLD). Some educational settings in the United Kingdom have established this approach in their schools, and have recognised its efficiency. The intention of this article was to summarize and discuss the literature that has been produced, relating to this approach. One of the main findings that emerged from this contextualised review is that II has given children with PMLD social lives and mutual pleasure, producing tangible consequences, such as regular and spontaneous interactions by identifying the existing abilities regarding Interactive Communication (IC). Then, this article contributes to the corpus of knowledge in the field of special educational needs, specifically for children with PMLD and consequently encourages the implementation of II in school settings and social care centres.

Keywords: Intensive Interaction, PMLD, Disability Studies, Interactive Communication.

Preface

Children explore the world by moving around and using their senses, motivated by innate curiosity and the responses of others (Goldbart, 1994; Trevarthen, 2008). This exploration, as Trevarthen (2008) explains, builds an awareness of the surrounding environment and encourages communication and interaction with others. The skill of IC is therefore vital for children because their quality of life is informed by the quality of interactions that affect several key aspects of their lives, from selecting food to building and maintaining relationships (Nind, 2007; Porter, Ouvry, Morgan, and Downs, 2001). Nind and Hewett (2001) also argue that a focus on communication is necessary because the ability to communicate makes a crucial difference in quality of life. These observations support the fact that, if a child is

unable to communicate,[1] he or she may not be successful in other daily activities (Bradley, 1998; Mednick, 2007).

The ability to interact and communicate is delayed in children[2] with PMLD[3] (Porter et al., 2001), which means that the child relies on others to interpret his or her responses (Simmons & Bayliss, 2007). According to the

---

[1]In this article, the use of the words communication, interaction, and sociability all relate to the term Interactive Communication.
[2] Throughout this article, the term 'children' is also used to refer to adults or students.
[3]In the Kingdom of Saudi Arabia (KSA), professionals use the Arabic translation *Intellectual Disabilities* (ID), which can be considered a synonym for the United Kingdom's (UK) terms *Learning Disabilities* (LD), *General Learning Disabilities* (GLD), or *Learning Difficulties*. In the UK, some practitioners use the term 'Learning Difficulty' as synonymous with 'Learning Disability' (Intellectual Disabilities), and some use 'Learning Difficulty' or 'Learning Difference' to refer to all students with learning needs.

literature, this issue is the result of a child's multiple disabilities and the complex needs connected with them (Goldbart, 1994). Within the model of medical practice and according to the developmental model, children with PMLD are usually described as having profound cognitive and communication difficulties; they may also share characteristics with other groups, such as those with physical, hearing or visual impairments (Simmons & Bayliss, 2007; Male & Rayner, 2007).

In the past, children with PMLD were often viewed as requiring only medical treatment. However, new theoretical approaches have altered the overall perception of these children and have influenced their education (Simmons & Bayliss, 2007). PMLD has been redefined within a more positive framework that departs from the stereotypical understanding couched within the medical and developmental models. Arid (2001) encourages a collaborative approach, suggesting that the needs of a child with PMLD can be satisfied through a collaborative understanding of their learning style, and within their environment. Pickles (2004) offers a different approach to identifying PMLD that involves parents and practitioners working together cooperatively to encourage the child to participate in society using his or her strengths and abilities. Porter et al. (2001) state that many children with PMLD are unable to use speech. However, they can compensate if they are in a sensitive environment by using their facial expressions, physical gestures and vocal sounds. Ware (2003) proposes approaches in which practitioners[4] act as facilitators, and notes that consistent responsiveness is essential to enabling children with PMLD to understand and gain some control over the world around them.

This article originated from a concern for children with PMLD in the Kingdom of Saudi Arabia (KSA), emerging from an overview of the problem for children whose needs are neither recognised nor treated effectively by the educational system, where very few specialised schools provide educational programmes for children with multiple disabilities or with PMLD in particular. This situation is because most special schools provide services only for those with moderate learning/intellectual disabilities. In my personal experience of working in the KSA's education system, children with PMLD do not receive the required support for their IC needs. Intervention planning does not typically prioritise IC compared with physical and medical therapy that receives a considerable support. If meaningful attempts to foster a responsive environment exist, it is usually due to the individual practitioner's enthusiasm rather than the presence of any educational framework. The lack of provision for IC needs thus results in limited progress for children with PMLD within the education service, if any progress at all is made. This lack of treatment often leads to the child's removal from school, either into the home or

a long-stay institution. Unfortunately, children with PMLD—those with the greatest need for IC—have limited contact with their peers and become completely withdrawn.

Moreover, there is a lack of academic research in the KSA that explores the importance of enhancing IC for children with PMLD, or any studies offering new approaches to address this need. The Saudi Disability Code (2001) was passed by the Ministry of Education via the General Department of Special Education to guarantee the rights of people with special needs. It comprised 16 articles encompassing policies in all areas related to the provision of services for children with special needs. For example, Article 1 included educational policies concerned with the provision of services for children and adults with special needs, while Article 2 guaranteed services for children and adults with special needs, including continuous curricula development (KSA Ministry of Education, 2016). These policies recognised that the needs of certain children, including those with PMLD, are of equal importance to those of all children. This represents an opportunity for me as a postgraduate research student to produce an article arguing that children with PMLD should be able to express themselves, and should be able to do so within a sensitive and responsive environment.

An analysis of the related literature, identifies the Intensive Interactive approach, which is widely used in the UK to build communication with children with PMLD and autism (Nind, 1999; Jones and Howley, 2010; Fraser, 2011; Argyropoulou and Papoudi, 2012; Lloyd, 2015). The benefits of this method are acknowledged by UK governmental bodies, such as the 2001 Qualification and Curriculum Authority and the 2000 Office for Standards in Education, Children's Services and Skills (Kellett, 2005). Reading about this approach encouraged me to continue with my research, to watch practical DVDs and to attend workshops. This article, therefore, is concerned with supporting stakeholders to develop an interactive environment for children with PMLD, and also to encourage further research in that context

Then, four topics address: how PMLD is defined in practices within the KSA, how the literature addresses the impact of multiple disabilities on the IC of children with PMLD, the environmental impact of IC for children with PMLD, and further details concerning the II approach.

1. The definition of PMLD in practices in the KSA

This article is not intended to offer details concerning services provided for students with PMLD in the KSA, but rather to provide a brief analysis of the definitions found in the KSA's education policies. In the KSA, 'Multiple Disabilities' (MD) is a common term used to describe children with dual disabilities. These disabilities might include multi-sensory disabilities, intellectual disorders,

---

[4]In this article, practitioner can refer to a teacher, other member of school staff, professional or stakeholder.

behavioural disorders, or physical disabilities (KSA Ministry of Education, 2016). In contrast, the term 'Profound and Severe Intellectual Disability' is commonly used to describe severe general cognitive difficulties (ibid.).

This article is concerned with children with PMLD, who are categorised in the KSA under both MD and 'Profound or Severe Intellectual Disability'. However, it should be noted that there is a difference between the term 'Dual Disabilities' (DD), which refers to children with hearing and visual disabilities, and children with MD, which refers to children with more than one disability. In addition to severe general cognitive difficulties, children with MD often have other difficulties, such as sensory disabilities that include visual or hearing disabilities, health difficulties and physical disabilities that include intellectual disabilities, since the term is used interchangeably with DD in the KSA's education system.

The characterisation of disability in the KSA's education system often focuses on the child's disabilities through a medical and developmental lens. Children with PMLD are viewed as possessing a high degree of dependency linked with profound cognitive impairments, which is determined by a score below 20 on the normative IQ test, according to the classification of intellectual disabilities. Moreover, their physical disabilities are defined by a lack of bodily control and difficulty in movement, arising from problems relating to skeletal deformity. These factors contribute to the need for wheelchair support, as well as a high level of personal care provided by adults. The disability is further compounded by the presence of complex health conditions that render the child permanently dependent on technology, which may require lifelong medical care. These conditions include epilepsy, respiratory difficulties, incontinence and gastrointestinal problems that impact their nutritional needs. Finally, the child often has issues with eating due to a poor ability to swallow and impaired lip and tongue control, together with problems with sleep due to interrupted breathing and difficulty in changing position.

The following section analyses how these difficulties are viewed as obstacles in developing IC for a child with PMLD.

2. Analysis of the literature concerned with the impact of disabilities on the IC of children with PMLD

Ware (2003) states that difficulty with IC influences the perception of children with PMLD by peers and practitioners, and can lead to fewer communication partners, increased social exclusion and fewer value-rich experiences. Moreover, as Simmons and Watson (2014) state, IC affects the ability to learn how to explore the world, to interpret the responses of others, and to develop an awareness of what to communicate. Nind and Hewett (2001) demonstrate that children with PMLD possess a limited understanding of language and appear remote because they make little contact with those around them. Therefore, the ineffectual process of engaging in IC is recognised not only to be a result of profound intellectual disability, but also of MD, such as those described below.

Behavioural rate and stereotyped behaviours: Behavioural rate, or the frequency of behaviours displayed, is viewed as an element of effective IC. Ware (2009) states that the behavioural rate is very low in some children with PMLD, occupying only 20% of their day because they are often drowsy or asleep. Bunning (2009) indicates that the behavioural rate in children with PMLD is volatile since the duration of the periods of activity and alertness are brief. Moreover, children with PMLD exhibit stereotyped behaviours, such as flapping their hands and rocking (Ross and Oliver, 2002), making disruptive noises, performing repetitive actions and making hand movements in front of their eyes, all of which are viewed as unacceptable behaviour (Hogg, Sebba & Lambe, 1990). Some of these behaviours are due to medical reasons. For example, ear infections may lead to head banging, and the side effects of some drugs or a sensory disability may cue visual mannerisms, such as eye-poking and hand movement in front of the child's eyes (Graham, 2004; Hanna-Trainor, Taggart, & Cousins, 2016). Thus, Farrell (2006) explains that these behaviours may often discourage spontaneous initiation of communication by a child with PMLD.

Physical disabilities: Physical disabilities further hinder the process of IC. As Ware (2003) notes, physical difficulties mean that children must be closely monitored when engaged in any activity and require permanent daily support. The need for assistance usually affects the child's ability to participate freely in social activities. Moreover, Barr and McIlfatrick (2012) and Corke (2012) report that an imperfection in the muscle control of the lips and tongue will limit or prevent the child's ability to make the sounds necessary for interaction. Furthermore, Mednick (2007) states that most communication devices require arm or hand coordination as well as flex control, and thus renders children with PMLD dependent on adults who must interpret their responses, which presents problems regarding the ability to establish new relationships.

Imray (2008) and Goldsmith and Goldsmith (2007) demonstrate that children with PMLD often struggle to develop the physical posture required in contexts such as a classroom. They may lie in inappropriate positions, which affects their ability to sit, and limited mobility can create inflexible body movements and poor postural positions. Hogg et al. (1990) and Corke (2012) confirm that children with PMLD find it difficult to maintain good posture and, because any interactional movement requires subtle adjustment of balance and positioning, they often find it challenging to control their body movement. Finally, physical difficulties usually require

surgery, which means that these children can spend the majority of their time lying on their back in the hospital or at home (Bellamy, Croot, Bush & Smith, 2010; Barr & McIlfatrick, 2012), which impacts their ability to participate in everyday IC.

Sensory disabilities: Sensory issues are viewed as a significant problem, despite the fact that sensory issues may be less visible in a child with PMLD than their physical disabilities (Brown, McLinden & Porter, 1998; Sobsey & Wolf-Schein, 1991). Vision and hearing are the fundamental connections between a child and his or her external environment (Brown et al., 1998) because sensory information enables the child to understand the space around them (Bradshaw, 2001; Bennett & McGowan, 2014). Simmons and Watson (2014) observe that some children with PMLD might have an aversion to certain sensory information because they struggle to manage an increase in information. This aversion affects the child's bodily movement and coordination, sensorimotor skills and acceptance of sensory input, thus reducing the child's motivation to learn from the environment (Clarck, 2012). Therefore, as Pawlyn (2009) notes, sensory difficulties prevent children with PMLD from moving towards intentional communication.

All of the factors above are frequently observed by practitioners, who focus on how these disabilities have adverse effects on the ability of children with PMLD to participate in IC situations. However, this does not mean that these children are entirely unable to communicate, since IC occurs even in the absence of speech. Nind (2007) and Porter et al. (2001) argue that the difficulty in IC primarily stems from a lack of encouragement regarding the responses of children with PMLD to their environment.

The next section outlines the IC ability of children with PMLD, and discuss how the environment impacts on the communicational abilities of these children.

3. The environmental impact on IC in children with PMLD

This section explores how the environment can impact an oversight in identifying pre-intentional IC in children with PMLD. Despite several interpretations of the term 'communication', Goldbart (1994) identifies the following communication stages necessary to achieving a 'Communication Intentional Action'. In Goldbart's framework, the first stage is the 'Reflexive Stage', during which the child produces a variety of vocalisations relating to hunger or comfort before they can formulate coherent speech. The child subsequently realises that he or she can achieve their goal through repeating the sound that provokes a consistent response in an adult. The child is then able to learn about themselves and their environment through observing the consequences produced by these reflex actions. This process informs their understanding of how things occur through

sensations and movements, and the child thereby progresses to the second stage, known as the reactive stage. The reactive stage is followed by the proactive stage, in which the child is capable of conveying a multitude of deliberate signs or body movements, thereby achieving the ability to produce intentional communication that can be easily observed and answered. Within this model, the communication skills of children with PMLD occur in an early pre-intentional stage of development, which typically appears during what Piaget calls the 'sensory motor stages' that occur between birth and up to two years of age (Ware, 2003).

However, it has been proposed that IC can occur even when there is no intended speech. Bloomberg, West and Johnson (2005) note that communication includes not only oral language but body language, to which other people can respond. Bunning (2009) states that body language is a crucial part of communication that occurs before decoding verbal communication. Therefore, the communication characteristics of children with PMLD should not be defined solely within the pre-intentional communication stage (Bradley, 1998), wherein the role of environment is crucial.

Communication is an interactive process that evolves from dynamic social interchanges in which both individuals involved in a communication situation share a responsibility (Grove, Bunning, Porter & Morgan, 2000). Fogel (1993) confirms that communication is a continuous two-way process between the child and the practitioner and that the child should not, and cannot, be the only actor, since the listener plays an active role in communication and interacts with the speaker. This process means that reactions to the environment can produce difficulty in IC, and one that is not child-dependent but instead is practitioner-dependent, as in the following examples.

Children with PMLD often struggle to respond to environments that are outside of their regular field of effective communication. From my own personal experiences as a teacher in the KSA's educational setting, children with PMLD, especially those included in busy classrooms, spend the majority of their school time using physiotherapy equipment, such as a standing aid chair, and are largely ignored by the teachers, who favour children who are more able to communicate.

In another example of how environment plays a crucial role, children with PMLD may not be encouraged to understand that they can control their environment, such as being able to express their desires (Ware, 2004). Despite the fact that children with PMLD are known to express themselves much more slowly (Hogg et al. 1990 and Detheridge, 1997), from my experience, many teachers discourage signs of communication or do not wait for a reasonable amount of time for the responses of children with PMLD. As Porter et al. (2001) states, this encourages children with PMLD to remain quiet. During my master's degree, which I undertook in the UK, I visited a mainstream school with a special classroom for children

with PMLD, where I observed a teacher enabling a child with PMLD to express their preferences. I questioned the teacher's motivation and reasoning, considering the child could not act directly. However, a few minutes later, the child smiled at the teacher, demonstrating that the teacher could interpret the child's response, and react to him positively (Aljaser, 2010).

Frederickson and Cline (2009) focus on practitioners' negative expectations and perceptions of children with PMLD regarding their communicative ability, as well as the practitioners' own belief in their ability to change the outcome given the child's severe disabilities, which influences the success of the interaction. Detheridge (1997) argues that practitioners will not notice communication signals if they already have low expectations of a child's abilities. Jones (2005) notes that, due to labels referring to the children regarding their complex needs, teachers did not have positive views of children with PMLD, and this in turn influenced the children's education. These views are key factors that influence how and why children with PMLD are not acknowledged within the KSA's school system.

Families might also have negative views of children with PMLD. For example, parents sometimes ask for help in stopping their child's screaming, unaware of the fact that this is the first step in developing intentional communication and may be a sign of the child's happiness (Aljaser, 2010). According to Nind (1996), this behaviour may simply be one form of the child's communicative behaviour, especially if it occurs in response to related interactions with adults. Graham (2004) highlights the fact that most non-verbal expression by a child with PMLD appears to express emotion, such as pain, hunger or enjoyment, which are conveyed via sounds such as crying or shouting which are ordinarily considered to be antisocial and therefore lead to the isolation of children with PMLD.

In a final example, stereotyped behaviour can be seen as a key feature of communication in those with PMLD (Ross & Oliver, 2002). Instead of being treated as communicative, until recently these idiosyncratic stereotyped behaviours were categorised as ritualistic or self-stimulatory and were regarded as undesirable. However, researchers now challenge this assessment (Murdoch, 1997; Nind & Kellett, 2002) and place less emphasis on stopping stereotyped behaviours and more on understanding them (Crawford, Brockel, Schauss & Miltenberger, 1992). Siegel-Causey and Wetherby (1993) state that, based on the assumption that all individuals communicate in some way, interpreting non-symbolic behaviours as potentially communicative is critical to enhancing social interaction with children with severe learning disabilities.

In summary, it is important for those who support children with PMLD to attempt to understand their means of communication (Fogel, 1993) and to find effective ways to interact with them (Graham, 2004). The

discussion above shows the importance of the environment for communicating with children who have PMLD. This demonstrates, then, the significance of the II approach. This approach, discussed in the next section, aims to develop meaningful relationships with children with PMLD by focusing on activities that have real meaning for them to refine their existing IC skills.

4. The Intensive Interaction approach (II)

4.1 Origins

Melanie Nind and Dave Hewett, working at Harperbury Hospital School, are the foremost theorists of the II approach. Harperbury Hospital School was a long-stay facility catering to children and adults with severe and multiple learning difficulties. Nind and Hewett (2005) describe how the experiences of these children presented a tremendous challenge at that time, during a period in which the behaviourist approach[5] was at its peak. By the mid-1980s, a group of new staff in this hospital had grave concerns that behaviourism could result in their failure (ibid.).

Nind and Hewett criticise the behaviourist approach, claiming that it offers little room for considering the strengths and interests of the child, hence rendering it meaningless for children with PMLD. Moreover, behaviourist approaches do not facilitate spontaneous and purposeful language; rather, they isolate communication skills (Kellett, 2003). As children with PMLD are unable to develop meaningful interaction in this context and possess a limited understanding of their environment, they exhibited stereotyped behaviour and total self-absorption as well as an aggressive defence of their isolation (Nind & Hewett, 2005).

Behaviourism rejects the possibility of biological factors in influencing behaviour: for example, innate human behaviours such as vocal variations. The behaviourist theory assumes learners to be passive and, therefore, control of their behaviour can be achieved superficially through both positive and negative reinforcement.

---

[5]Behaviorism is a major theory within psychology, based on the observation of behaviors on the principle of stimulus responses, which proposes that children may be stimulated to learn through positive and negative reinforcements called Operant Conditioning, in which they are aware of the consequences of their actions. This awareness encourages children to act and behave in ways that will not produce negative consequences. The traditional system of teaching in behaviourist theory is a supremely structured teaching program, and establishes specific objectives for each child, related to how they fit into a core skills checklist. The teaching approach focuses on building skills centred on promoting self-help, developing autonomy, and maximizing a sense of independence.

Moreover, behaviourism focuses primarily on how a change in actions can be achieved through reinforcement, rather than by considering the mental processes of the individual, or by understanding the mental processes influencing the behaviour of individuals. This theory can be related to cognitivism[6].

The question of ethics and the effectiveness of the programme used within the school was therefore raised by Nind and Hewett (ibid.), who view it as being inadequate for understanding the behavioural needs of children with PMLD. They subsequently recognised that, if they could establish a basis of communication with the children, the rest of their learning would become more meaningful. Kellett (2004) states that new modes of thinking emerged in the school staff, focused on the premise that children require a reason for communication to develop. Kellett (2005) explains that the staff acknowledged this starting point as fundamental to developing the beginnings of learning how to share space with one another. The staff felt that it was meaningless to attempt to teach children without first becoming familiar with them; as a result, they identified behaviours in the children that the curriculum rarely mentioned (Nind & Hewett, 2005). Nind and Hewett consider meaningful learning to be both a form that emphasises the child as an active participant, empowered to take control of their learning, and a learner-orientated form that heeds the child's pre-linguistic behaviour and social context (Kellett, 2004).

Nind and Hewett have developed an awareness of how IC develops in its earliest stages, inspired by the theory of augmented mothering as developed by Gary Ephraim (1979). This theory is derived from the natural processes of caregiver–infant interaction (Samuel, Nind, Volans & Scriven, 2008). Through reviewing the literature of caregiver–infant interaction and by analysing films of mother–infant interaction, the school's staff developed a model to understand how communication skills are learned in the first years of life and how interactive play has a crucial role in its ongoing development (Nind & Hewett, 2005).

However, II is not simply the mother–infant relationship (Hewett & Nind 1998). Nind and Hewett alter the professional elements of planning and monitoring within

their team's teaching environment and aligned it with the infant-parenting approach (Samuel et al. 2008). The pedagogical aspects of the infant-parenting approach consist of interactive games directed at developing sociability and communication skills in a child with PMLD (Kellet, 2004). The school staff also evaluated the structure ofthis approach (Nind & Hewett, 2005).

The staff then incorporated interactive play in their school routines, transforming the schedule from being non-personal, and hence stressful, to being more playful. This approach included playing a peek-a-boo game, moving to different parts of the building, and blending walking rhythms. In these activities, interaction was playful and staff provided warm physical contact. These experiences were rewarding and even became enjoyable, and the children responded positively. As the practice continued, the children exhibited signs indicating that they wanted more of such activities (Nind & Hewett, 2005).

This approach was employed in bringing the children to table-based tasks and activities in which the play itself soon took priority over the initial task. Many children subsequently ceased the table-top activities and engaged instead in free-flowing interactive play, without any prescribed task. The children felt safe on the floor and in the corners of the room, where they enjoyed time in their self-absorbed world. In this situation, the staff were able to capture the attention of children who had previously rejected the school's approaches.

The staff then rewrote the school's programme to incorporate its new aims, and began recording their daily activities to assess how the children progressed (Nind & Hewett, 2005). They continued their analysis of the theoretical literature of the 1970s and 1980s related to caregiver–infant interaction (Kellett, 2004) and evolved a new structure of working, sharing their findings with the other school staff (Nind & Hewett, 2005). Furthermore, they undertook formal research projects, thereby gaining a greater insight into the means of implementing the approach and describing its success in enhancing the communication and social development of children with PMLD.

As will become evident later in this article, Intensive Interaction differs from traditional behavioural intervention approaches. In II, the intervention is much more spontaneous, flexible and co-constructed between the practitioner and the child, whereas behavioural intervention involves enforcing changes in the child's skills, directed by practitioner reinforcement (Zeedyk, Caldwell & Davies, 2009). Nind (1996) argues that behaviourist theory does not relate directly to the II approach of learning since it is ordinarily characterised by reward and reward withdrawal, which has been shown to be ineffectual when addressing children with PMLD. Instead, the focus should be on a more malleable system, based on interactive games in caregiver–infant models that allow individual behaviour.

---

[6]Cognitivist theory proposes that changes in an individual's behaviours constitute an indication of what is occurring in their mind (Demetriou and Spanoudis, 2017). This indicates that cognitive theory is concerned with the ways in which individuals learn, specifically the mental activities involving memory, reasoning, understanding, and other cognitive processes, because the actions of individuals are the results of their thinking (Demetriou and Spanoudis, 2017). The theory therefore opposes behaviourism, in that human beings are not organisms that respond to stimuli. Instead, they are logical beings who need to engage in activities in order to learn. Children with PMLD are able to express their cognitive needs by employing physical interaction in order to complement a meaningful interaction. Because changes in behaviours are indicative of internal thoughts, a child rubbing his or her head may be showing an outward sign of their thoughts.

4.2 Description of the Intensive Interaction Approach (II)

Despite the existence of certain strategies for its provision, II can be seen as creating a basis for natural interaction (Nind & Hewett, 2005) in order to identify the sociability and communication skills of children with PMLD, based on the use of communication techniques employed through infant-caregiver communication interaction (Nind, 1996; Sharma & Firth, 2012). The II approach was initially viewed as a pedagogical tool highly relevant for addressing the challenges of the development of fundamental social and communicative skills (Nind, 1996), and as a tool for special educational needs (Firth, Elford, Leeming & Crabbe, 2007).

This approach was specifically developed to work with children who spend large amounts of time withdrawn as a result of self-orientated behaviours (Kellett, 2003), who depend on others to interpret their needs, whose lifestyles may appear remote and isolated (Nind & Hewett, 2001), who rarely tolerate physical closeness with others, who appear not to understand human interaction (Nind 1996), and who are unable to learn the fundamentals of social communication, such as children with PMLD (Kellett & Nind, 2008).

4.3 The aim of the Intensive Interaction approach (II)

The aim of II is to use purposeful procedures to enable partners to work towards establishing fundamental communication abilities, such as eye contact and facial expression; sociability, or the desire for taking part in interaction or initiating interaction with others, and behaving in a variety of ways that entail contact with a partner; cognitive abilities, such as predicting the social behaviour of a partner in terms of cause and effect; and emotional well-being, including diminished anxiety and enhanced feelings of joy (Kellett, 2004). In the context of a child with PMLD, his or her interpersonal behaviour would thereby become meaningful, intentional, and engaging (Firth & Barber, 2011)

After identifying the approach and aims of II, the next section of this article examines the philosophy behind this emergent approach, together with its theoretical background.

4.4 The philosophy behind the Intensive Interaction approach (II)

Several philosophical concepts underlie the II approach, including; an emphasis solely on communication, as opposed to other abilities, can be seen to *fulfil a basic human need* encompassing achieving physical needs, identity needs, and social needs (Hewett, Firth, Barber & Harrion, 2012). Nind and Hewett (2001) confirm that, if communication is not achieved, interaction is far less likely to be successful, and it may, therefore, become more difficult for the child to learn anything else, which results in a negative impact on his or her ability to make sense of the world and to have an impact upon it.

An alternative philosophical approach contends that II focuses on *meaningful interaction*. Kellett (2003) states that, for communication to develop, a child requires an intrinsic reason to interact with others. Thus, II is an interactive relationship involving many intentional or unintentional components. This approach therefore focuses on the cognitive arena as the primary location for fostering communication skills, such as turn-taking, the use of signs and other interaction abilities, because emotions arise and are controlled by the brain (Lacey, Ashdown, Jones, Lawson & Pipe, 2015).

Other philosophies behind II can be seen as based on *valuing the child* as a socially proactive individual whose behaviour is worthwhile, since II practitioners perceive all behaviour as being valuable and intentional, and imbue it with meaning by imitating it (Nind, 1996). Regarding this approach, no form of behaviour is ignored, even if it appears unclear (Nind & Hewett, 2005). Firth et al., (2007) add that the role of II practitioners is to be more effective partners in communication, as Nind (1996) notes, by adjusting their behaviour in order to become more engaging and meaningful for a child with PMLD and to treat the child as if he or she were intentionally communicative.

II is concerned with accepting others (Nind & Hewett, 2005). Kellett (2005) describe this approach as being gentle and respectful in its orientation towards the implicit pedagogical style of playful interaction. Nind & Hewett (2005) add that II is seen as a practical approach that assists a child with PMLD and the practitioner to understand one another, being both intuitive and enjoyable, and engaging one another's attention.

Additionally, II was founded on a philosophy of *providing opportunity*; children with PMLD may not have the opportunity to reach the early stages of communication (Barber, 2007). However, the II approach provides the practitioner with an opportunity to understand the child's communication style and to create a significant relationship with the child, with the result that the child feels the practitioner understands them (Caldwell & Horwood, 2008).

Finally, *refusal to perceive a child as a passive recipient* (Nind & Hewett, 1988) is implicit in the philosophy underlying the II approach. As noted previously, children with PMLD are at a pre-verbal communication stage, and this approach offers a child with PMLD the opportunity to use their methods of communication, even if these modes are traditionally viewed as being challenging behaviours (e.g., via physical touch, hand movements, vocalisation, and facial expression) in order to ensure that the child's actions are not overlooked (Nind & Hewett, 2005).

II is not simply a means of communicating; it also constitutes a theoretical approach. The next section

discussed the background theories that can be employed in constructing this approach.

4.5 The Theoretical Background of Intensive Interaction approach (II)

This section assesses the relationship between the II approach, Augmented Mothering Theory and Interaction Theory.

Augmented Mothering Theory formed the foundation which inspired II and guided the process of its development (Kellett, 2003). Nind (1996) states that there was an increasing recognition of the fact that sociability and communication skills develop during the early years of life, and that this relates to a fundamental element of communication. The main focus of the II approach development of is fundamental communication skills, which refers to the most basic, non-symbolic forms of communication. These skills are ordinarily learned before the development of more abstract language and are gained through various channels, such as sound, including grunts and lip-smacking; visual signs; and physical contact, including touch, clapping hands, or foot-tapping (Hewett et al., 2012).

Kellett and Nind (2008) state that this theory emulates the model of early caregiver–infant interaction regarding how infants commence interaction with adults at birth. They note that a child begins to learn to communicate with, and respond to, others by using eye contact and facial expressions in their interactions with their mothers. Nind and Hewett (2001) confirm that fundamental communication skills are simultaneously employed when infants make contact with others and that these skills are learned before speech, which means that infants have mastered the basics of communication within one year of birth, thus enabling them to engage in social interaction and to receive prolonged attention from others.

Nind (1996) states that the evolution of caregiver–infant interaction literature and research had contributed greatly to the understanding of optimum processes of the interactive style for infant development[7]. For communication to develop, it is crucial for the practitioner to identify the fundamental communication skills of children with PMLD, by interpreting body language, learning to pay attention to the child, learning about their concept of personal space, and working on valuing these skills (Nind & Hewett, 2001).

An explanation of the theoretical intervention models of II can be seemed as related to Interaction Theory.

---

[7] Nind cites works such as Bell, 1968; Sameroff, 1975; Bromwich, 1981; Hodapp and Goldfield, 1983; Stern et al., 1977; Bruner, 1983; Kaye, 1977; Field, 1977; Stern, 1974; Snyder-McLean and McLean, 1987; Seifer, 1983; Fogel, 1983; Bruner, 1983; Arco and McClusky, 1981; Schaffer, 1977; Beebe, 1985; Goldberg, 1977; Pawlby, 1977; Lewis and Coates, 1980; Carlson and Bricker, 1982; Bruner, 1975; Clark and Seifer, 1983; and Guralnick and Bricker, 1987.

Approaches based on the Interaction Theory view responsibility for IC as being shared between the partner and the child, rather than being encompassed within the child's disabilities. Since developing IC focuses on building meaningful relationships with the child through an understanding of the optimum interactive style of the child in question, there has been a move towards more socially-centred approaches and away from task-orientated, behaviourist approaches (Aljaser, 2010). Moreover, Ware (2003), a passionate advocate of creating environments that are responsive and sensitive to the behaviours of a child with PMLD, argues that opportunities should exist for children to respond to the environment and to instigate change in the people and space around them.

This approach thereby promotes the significance of a child with PMLD gaining social skills through a positive social experience in which they are emotionally connected with others, and in which they have repeated opportunities to learn a fundamental skill when socialising with others who are mutually responsive (Hewett et al., 2012). Zeedyk et al. (2009) explains that II is a good example of interactive/reciprocal approaches, which emphasise child-led activities and sensitive responses. The importance of the care provider's responsiveness to the child with PMLD is stressed at the transitional stage, when individuals move towards intentionality and away from pre-intentionality (Kellett, 2000).

In demonstrating the relationship between these theories and II, different viewpoints are proposed to understand the interpersonal behaviours of a child with PMLD. The next section will outline the practical aspects of the II process.

4.6 The Process of Intensive Interaction approach (II)

Watson and Fisher's (1997) II approach differs from other traditional intervention models by having no pre-selected goals for the child, using no structured teaching; it can be applied to many different activities during the school day. According to Hewett et al., (2012), II is an approach that incorporates principles, not rules; it is an approach that rarely tells the practitioner what to do. Instead, II is a strategy that the practitioner and the child decide on moment-by-moment, and entails a decision-making process that is dependent on reading the child's behaviour.

The following describes the steps involved in conducting the II approach:

Preparation and planning: Nind and Hewett (2001) explain that preparation should not be rushed. The watchwords when commencing the II approach is *relax*, *respond* and *enjoy*. Hewett et al. (2012) state that it is not practical to design a specific plan, since activities develop spontaneously. Instead, practitioners should prepare schemes of work, which can entail any documents that provide details for the schoolchildren's area of work. For example, a scheme of work could outline what the child is

\attempting to do, how he or she is attempting to do it and the appearance of the potential outcomes (Hewett et al., 2012).

Observation: Even if the practitioner is familiar with the child before employing the II approach, the success of the process is dependent on subjective observation, which involves identifying, moment-by-moment, what the child is engaged in during the day. These observations assist the practitioner in perceiving every potential aspect of the child's communication (Kellet & Nind, 2008). The observed behaviours can assist in forming the practitioner's first attempts at responding (Nind & Hewett, 2001).

To facilitate observation, the next step is to devote time to understand more about the child's behaviour (Nind & Hewett, 2001). Observation in II need not be distance observation; it can be simply sitting near the child, enjoying the child's behaviour and paying attention to any possible communication to learn the individual intricacies of the child's behaviour (Hewett et al., 2012). At this stage, observers should also document their observations to provide a baseline for the child's present performance in communication (Nind & Hewett, 2001). This can take the form of video recording or writing comments about the child's behaviour (Hewett et al., 2012).

Furthermore, at this stage, observers should ignore assumptions about the children and accept that they are capable of engaging in a wide range of interactions, such as small hand movements, rocking, flapping, spinning, vocalising, tapping, skipping, sitting, moving continuously, starting and seemingly endless repetitive behaviours (Hewett et al., 2012).[8]

Quality one-to-one time: Practitioners should organise one-to-one time with the child. In the early stages, II sessions are brief; they might be a few seconds for a few times each day. Over time, when there is sustained attention on the part of the child, the sessions may increase in length from one to two minutes; five minutes or more would constitute a long session (Nind & Hewett, 2001).

According to Nind and Hewett (ibid.), organising a quality session requires finding a place where the child feels relaxed and at ease: for example, in the corner of the classroom, on beanbags or in a swimming pool. Moreover, practitioners should view themselves as the main resource regarding face, body language, voice and senses. The practitioner serves as a flexible and enjoyable resource to create free-flowing activities with the child. However, any object, such as a toy, can also be used as a form of interaction content (Hewett et al., 2012). Hewett et al. (ibid.) also emphasises that II sessions include a considerable amount of physical

---

[8] For more information on to how to recognise progress, refer to Kellett and Nind (2008, p.122-129).

contact; therefore, the practitioners should place themselves physically close to the child, and even in a lower position.

Accessing and the first attempt: Making access can be described as the processes of a practitioner seeking to find the first actions of interaction that successfully create shared consistent interest on the part of the child (Hewett et al., 2012). Such first attempts are made by placing the child and the practitioner in a position where it is easy for the practitioner to engage in an enjoyable activity with the child (Hewett et al., 2012), such as simply sitting together in close contact (Nind, 1996).

The practitioner's task at this stage is to consider whether the child responds with a moment known as 'lighting up', in which the practitioner behaves in a way that engages the child's attention (Nind & Hewett, 2001). Hewett et al. (2012) emphasises that the practitioner must then remain alert, watching and waiting and make careful notes during the session concerning the child's gestures, rhythms and vocalisations. They add that, at this stage, the practitioner must remember that every behaviour is meaningful, so they must listen and gather information using all of their senses (Hewett et al., 2012).

Nind and Hewett (2001) state that, in addition to the practitioner's written notes, the first attempts should ideally involve other colleagues who are video recording the interaction. Watson and Fisher (1997) add that video recordings are invaluable tools for evaluation during the II process because they can assist in increasing reliability and reducing bias, since they enable joint viewing and analysis. They add that videotape may reveal small developments in behaviour that are missed by practitioners or may produce further views or interpretations on the part of other school staff, while also providing tangible evidence of progress.

Let them lead: As previously state, this approach is recommended for children who are described as being difficult to reach, who are still at the very early stages of understanding the world, and who find being sociable an uncomfortable experience (Nind & Hewett, 2001). When a child with PMLD perceives that the practitioner is directly responding to their behaviour, the child will feel an element of control over his or her environment (Kellet, 2004). At this stage, the practitioner must then assist the child to dictate the external environment (Jones, 2003) by adjusting the interaction on the child's terms, as is the child's right (Nind & Hewett, 2001), and by engaging in a conversation that is appealing for the child by employing the forms of interaction the child prefers (Caldwell & Horwood, 2008).

The term 'leading' also entails the practitioner stopping when a child displays signs of negativity, which is to say when the child does not like something. II is an approach intended to assist children to enjoy others, to have power and to engage in activity on their terms, rather than the reverse. The ability to control the practitioner's responses

increases the child's desire to take part with confidence (Nind & Hewett, 2001). Nind (1996) states that, in II sessions, the practitioner must therefore develop their sensitivity to read the child's signals indicating a desire for a 'cooling-off period', a change in the game or an end to the interaction.

Evaluate the practitioner's performance: Since children with PMLD are in the early years of development, Hewett et al. (2012) state that expectations should be realistic; progress may take minutes, days, weeks, or months. At this stage, it would therefore be appropriate for practitioners to evaluate their performance during the II process and to consider future improvements.

The goal of this evaluation stage is to comprehend how to withdraw the child from their inner world and bring them into the outer world, how to transform their sensory monologues into dialogues, and how to engender interactional exchanges with the external space (Hewett et al. 2012). It can be argued that practitioners might consider these moments as simply 'fooling around'; however, it is in these moments that skilled practitioners can employ the appropriate behaviour necessary to gain the attention of a child who has difficulty giving it (Nind & Hewett, 2001). It is crucial to consider every action as a form of communication, even if the meaning it engenders is unclear at first. For example, some children with PMLD focus on minor details, such as clicking sounds or even their breathing (Hewett, 1995)[9].

Hewett et al. (2012) add that the response of a child with PMLD is neither immediate nor at the interaction speed to which the practitioner is accustomed. They add that the child's response may be very small and may not be recognised as communication; therefore, if the approach appears not to be successful, the practitioner should not persist but should instead stay attuned and withdraw to evaluate their actions, since the process may take months. However, Hewett et al. (2012) highlight the fact that the practitioner should remember it is not that the child cannot communicate with them; it is simply that the practitioner and the child have not yet found a way to communicate with one another[10].

Responding and reacting to the behaviours: At this stage, practitioners should employ the II principle that it is not the flexibility of the child's skills that enable meaningful involvement in a social interaction, but the flexibility of the environment: in other words, the practitioner with whom the child interacts (Barber, 2008). Nind and Hewett (2001) state that the signals of a child with PMLD might be idiosyncratic and, because these behaviours are dissimilar to conventional forms of

communication, practitioners fail to interpret them or even to notice them. Therefore, the practitioner's role is to respond to the child's behaviour with the aim of supporting their involvement in enjoyable social interaction, no matter how idiosyncratic the child's behaviour appears, or whether the child interacts (Nind & Powell, 2000).

The practitioner should respond to the first signals the child attempts by immediate imitation, even employing extremely simple behaviour. By doing so in the context of an emergent conversation, the practitioner employs behaviours that the child recognises as his or her own (Barber, 2008). According to Caldwell and Horwood (2008), practitioners should not expect a particular behavioural response, but rather should expect to 'be with' the child because they are engaged in the conversation. Nind and Hewett (2001) outline examples of actions that practitioners can attempt, such as vocalisation, other mouth noises, movements, facial expressions, physical contact and stereotyped behaviours such as tumbling, gentle rocking, being noisy and rough and intense mutual face-to-face engagement. In some cases, the child will not demonstrate any intentional communication signals; however, the child may demonstrate small actions that can potentially become intentional communication if the practitioner responds effectively (Nind & Hewett, 2001)[11].

Turn-taking is also a part of this stage, and the practitioner must be aware of the moments in which the child's attention is on them to assist the child to understand that an enjoyable conversation is one flexible enough to be pursued in any direction the child wishes (Nind & Hewett, 2001). Moreover, during this stage, the practitioner must modify the behaviours they imitate so that dialogue is slow, high-pitched or tonally punctuated and with frequent questions, as this is similar to the manner in which mothers speak to their infants. Other strategies employed during the first attempt to communicate with the child involve the need for the practitioner to be sensitive and 'tuned in' (Nind, 1996). Timing is an important component of the II approach, in which the practitioner seeks to be sensitive to signals from the child to achieve placation sequences (Nind & Hewett, 2005).

Continue the progress by being available: Sharma and Firth (2012) state that by adopting II techniques, a practitioner could learn to heed subtle changes in the body language of a child with PMLD. Once practitioners are confident in their understanding of the child, they must be available in a way that the willing child tolerates. Nind and Hewett (2001) state that one of the skills the II practitioner should develop is the ability to manage the body language of the child in the same way most people use their body when they communicate orally to explain

---

[9] A further example is available in Hewett et al. (2012), Chapter 5.
[10] For further explanations regarding how to proceed if there is no initial observable success, and how to conduct written evaluations, see Nind and Hewett's (2001) 'The Practical Guide to Intensive Interaction'.

[11] See Hewett et al., (2012) for examples of ways in which to respond to the child.

their meaning. Kellet (2004) adds that reflecting a child's behaviour is a means of displaying availability and promoting shared attention.

However, continuing to respond does not initially entail involvement in many actions, when simply attempting to respond and to pause are of foremost importance. The crucial aspect is in enabling the child to realise and recognise that the practitioner's actions are a result of what the child has just done (Hewett et al., 2012).

Maintain the process: Interactions often become longer and more sophisticated over time, as the child and the partner become familiar with one other, and recognise each other's preferences (Nind & Hewett, 2001; Hewett & Nind, 1998). According to Hewett et al. (2012), practitioners should persevere with what has been established and, as Rowland and Schweigert (1993) state, to have functional and regular communication with the child; it should occur regularly in everyday life, have palpable consequences and contain spontaneous expressions. The proponents of II, therefore, propose the use of the approach at any time and in any place, to seize every opportunity as it arises. II can be practised in any setting, such as by a teacher in a school context, or by a parent at the child's home (Hewett & Nind, 1998). The child will consequently become tolerant of, and interested in, initiating interactions with other school staff (Nind, 1996).

Moreover, interaction sequences that occur in the classroom form the core of the teaching activity, with games becoming more frequent, varied and sophisticated. Nind (1996) suggests that a repertoire of interactive games should be developed. These games could include activities such as those that Hewett and Nind (1998) propose, including peek-a-boo and 'round and round the garden'; games that involve shared rocking, such as 'row, row, row the boat'; and games that involve playful physical contact, such as blowing raspberries, which are consistently repeated[12]. Also, II presents an opportunity to shape an appropriate curriculum at the school level (Nind & Hewett, 1988; Kellett & Nind, 2008), as the approach can be applied during sensory activities, free time, health care tasks, ICT activities, physiotherapy activities and even in music lessons.

In summary, many practitioners may develop some of these discussed processes during their work with children with PMLD without discovering II, which confirms that II is a natural style of behaviour (Hewett et al., 2012)[13].

---

[12] More detail is available in Nind and Hewett (2001, p.53-66).

[13] Those who are interested in developing II skills effectively should consult a practical guide, such as *The Practical Guide to Intensive Interaction* (Nind and Hewett, 2001), *The Intensive Interaction Handbook* (Hewett et al., 2012), or chapter 16 of *Implementing Intensive Interaction* (Kellett and Nind, 2008), in order to understand more about the appropriate actions if there is no observable success in the first and subsequent early try-outs of the technique, how to conduct written evaluations, and how to make II enjoyable using interactive games (Nind, 1996; Firth et al, 2007).

4.7 The practitioner in the Intensive Interaction approach (II)

When using the II approach, the practitioner should follow these guidelines:

- Be positive, sociable and responsive to even the most challenging level of communication skills, enabling interactivity with any potentially communicative behaviour (Hewett et al., 2012);
- Aim to be a better communication partner (Nind & Hewett, 2005) by responding to all behaviours and engaging in meaningful conversations that a child with PMLD will recognise (Barber, 2008);
- Learn to respond in a consistent manner, which makes the practitioner interesting to a child with PMLD by establishing various interactive approaches or games so that social contact can be mutually enjoyable (Nind, 1996). All forms of behaviour on the part of the child should be accepted, no matter how idiosyncratic they might be (Nind & Powell 2000). Kellett (2004) confirms that the practitioner should seek to adopt enjoyable, game-like interactions. Barber (2008) explains that employing meaningful conversations is not dependent on the flexibility of the child's skills, but on the flexibility of the partner;
- Assume responsibility for initiating interactions, recognising that the child is a dynamic and active participant in the interaction (Kellett, 2004). This principle allows interaction to flow naturally, as if the child can demonstrate intentional communication (Nind, 1996) at any age (Samuel et al., 2008);
- Be willing to adapt to the interpersonal behaviour of the child, responding to behaviours such as facial expressions, voice pitch, eye contact, gaze, body posture and linguistic codes (Kellett, 2000), even if the child is at a pre-intentional communication level (Kellett, 2004) or is merely exhibiting stereotyped behaviour; and
- Respond to the smallest signals exhibited by the child, with an emphasis on 'repetition, imitation, turn-taking, blended rhythms, and burst-pause sequences' (Kellett, 2000, p.165) by slowing down the speed of speech, and scanning using micro-adjustments in order to achieve optimal levels of attention, thoughts, feelings, and stimulation (Nind, 1996).

The next section assessed multiple research studies to evaluate the outcomes of employing II.

4.8 The outcomes of Intensive Interaction approach (II) when employed by research practitioners

The final section of this article evaluates research findings regarding II, which is increasingly employed as a practice. This evaluation aims to identify a clear outcome with the aim of determining whether the use of II produces a sustained increase in IC behaviours in children with PMLD. First, this section will review some of

these applications, and then focus on discuss three evaluation studies that usefully demonstrate how II provides an optimal environment for communication and produces remarkable progress in the IC ability of children with PMLD.

Nind (1996) conducted a study of II with six children with PMLD in a long-stay hospital school. The study involved a 6-month baseline phase, then a daily II phase that lasted between 12 and 18 months. The study found that improvements existed in the responses of interactive behaviour among the children, regarding both physical contact and emotional expression. For example, all of the children developed the ability to look at the practitioner's face, to nestle into the practitioner, to explore the practitioner's face with their hands, to produce consistent vocalisations, to maintain joint focus by holding the practitioner's hand and smiling consistently. Moreover, two of the children, who had never before made eye contact, began not only to do so but to maintain it over a period, as long as the practitioner continued to use II when engaging with them. Furthermore, two of the children who had predominantly exhibited self-involved behaviours learned to engage in interactive games and ceased their previous behaviour. Another child who was mostly sleepy and unmotivated became alert, vocalising excitement and waving arms during interactive games. Another child who did not engage in any relationships changed to being a child with whom the staff enjoyed interaction.

In a study by Lovell, Jones and Ephraim (1998), an experiment was conducted with a 53-year old man living in a long-stay hospital, who was pre-verbal and possessed severe intellectual disabilities. He spent most of his time sitting alone and did not initiate any interactive contact. During five-minute II sessions, an increase in shared attention was observed, as evidenced by the man smiling, laughing and vocalising. The study also demonstrates an increase in the initiation of physical contact on the part of the man; in one session, he squeezed the practitioner's hands for 90% of the time as part of an interaction game. Moreover, he did not cover his face during the II sessions, and more than 10% of every session was spent looking at the practitioner. The member of the nursing staff who worked with him commented that she was more willing to interact with him as a result.

Watson and Knight (1991) conducted a one-year study with six children with severe learning difficulties, in which six members of staff applied II. The study found that the staff were convinced that the use of II built a positive relationship between them and the children. The staff learned how to be relaxed and willing to wait for the child's responses and how to observe the child's skills, which is viewed as a positive interactive experience in working practice.

Kellett (2000) conducted a year-long study of II with a five-year-old boy at a special school. His communication abilities indicated that he lived in a world of his own; he

used no symbolic language, no eye contact and was often engaged in self-stimulatory behaviours such as finger play and repetitive jiggling. A multiple baseline was deployed following the II sessions, combined with video-recorded observations. The study demonstrated that the child had made significant progress in maintaining eye contact with the partner's face, and an increase in engagement in social interaction was observed via the consistent use of his vocalising abilities.

A study conducted by Barber (2008) explains that II was introduced in an Australian school in the early 2000s. The II approach was employed following staff training, with children aged between 2 and 18 at the school who were specifically selected as result of their communication difficulties, high levels of social isolation, dnalarge amounts of time spent in ritualised, self-orientated behaviours that may indicate autism. During the 30-week period in which II was employed, the children initiated more social contact than before, such as physical proximity, touch, turn-taking and interactive game playing. Moreover, the sessions were enjoyable for both the practitioners and children, and produced satisfying interactions and relaxed dialogue.

In a study by Jones and Williams (1998), the focus of the research was a 35-year-old man with PMLD who lived in a residential hospital, did not use language, employed limited eye contact and exhibited a high frequency of stereotyped behaviours, such as flapping both of his hands and body rocking. The investigation discovered that the man's stereotyped behaviour was reduced during the interactive sessions compared with proximity-only sessions. Although the reduction in his stereotyped behaviour was challenging to achieve in many other studies, such as those conducted by Sharma and Firth (2012) and Elgie and Maguire (2001), this study provided evidence of the method's effectiveness under such circumstances. However, Sharma and Firth (2012) explain that social interaction behaviour and severely challenging behaviour may occur together. Their study indicated that positive developments also occurred, such as new behaviours, increased social engagement, improved attention, improved eye contact and a reduction in extreme behaviours such as banging heads and obsessive-compulsive disorders.

Similar findings were produced in a study conducted by Elgie and Maguire (2001), involving a 39-year-old blind woman who exhibited extreme, self-injurious behaviour such as inserting her fingers beneath her collarbone and damaging or pressing her face and eyes. The woman possessed no verbal skills and displayed limited non-verbal communication; she had profound learning disabilities, lived within the care system and was emotionally and socially isolated from the outside world. The II sessions lasted for 25 minutes and showed insignificant changes in her injurious behaviours, which indicated that, throughout most of her life, she had exhibited self-injurious stimulation. However, unlike previously when she made few spontaneous attempts to

reach others because of her lack of verbal skills and limited forms of non-verbal communication, during the II sessions, she displayed an increase in spontaneous hand contact and attempts at vocalisation to engage in a dialogue with, and respond to, the practitioner.

Kellett's (2005) study produced evidence relating to Catherine, an 11-year-old with profound disabilities coupled with perceptual impairments and quadriplegia. She was based in a special school and also suffered from infections and illnesses. After the adoption of II, an improvement was seen throughout all aspects of her quality of life. After the II intervention, Catherine—who had previously not made eye contact—was able to do so, and she was able to engage in joint focus activities. She also exhibited new behaviours, such as vocalisation, turn-taking and using sounds such as blowing bubbles and tutting. Kellet concludes that the study of Catherine increases the understanding of communication development in severely disabled individuals. Before her death, her parents were able to connect with her, and her mother recognised that, even after her death, Catherine had left a crucial legacy through her participation in the study.

Leaning and Watson (2006) conducted an eight-week study of five children with PMLD who were pre-verbal with limited non-verbal communication and had characteristics of avoiding interaction. The focus of the study was to develop the children's communication capacity and to produce constructive dialogue engagement with others. All participants engaged in a series of workshops to develop their communication and social abilities, together with other features of effective practice including management support, improved team tactics, intervention continuity, coordination and dependability. The study consisted of 50-minute baseline sessions before the II sessions. The results of the study demonstrated some increases in the children's interactive behaviours through the use of eye contact, an interest in interacting with others, and an increased incidence of smiling throughout the group, with a higher level of enjoyment than that experienced during the baseline phase. An analysis of the data from the follow-up session, which took place one month after the final session, revealed that the frequency of the participants' behaviours had deteriorated to a frequency similar to that of the baseline session. This outcome suggests that the techniques learned by the group were not, at that time, extended into other areas of the participants' lives. However, the research indicates that it is possible to teach II principles in three to four training courses with ongoing supervision, since improvements were identified in the practitioners' ability to engage with the children as participants, and they also felt more comfortable and able to reduce the child's self-stimulation during the interactions. This form of training supported the education policy that aimed to ensure the care of practitioners working with people with learning disabilities.

Zeedyk et al. (2009) reports on the effectiveness of the use of II in Romania, with six females and four males aged between the late teens to the early 60s. These participants had severe developmental delays that may indicate autism, including sensory impairments and profound learning disabilities. They also all engaged in self-injurious behaviours, such as biting their hands and hitting their heads, and were socially withdrawn. In this study, a group of volunteers from the UK were given a brief training session on the basics of II and were then encouraged to deploy it with the individuals. The study showed an increased engagement from the first II session, including an increase in the amount of attention the individuals paid to their partner, which was displayed in changes to their vocalisations.

Finally, Cameron and Bell's (2001) study focused on introducing II to a school's multidisciplinary staff and encouraging them to employ it. The researchers designed a programme to assist the staff in observing a young man with severe learning disabilities and challenging behaviour, who communicated only through vocalisations, using a few repetitive words. During the sessions, the staff used sensory objects to promote II, and an improvement was evident in their ability to respond to his non-verbal signals, together with an increase in the time given for responses from the young man. The outcome of the study shows that the use of II increased his eye contact and the initiation of communication, with more vocalisations and repetitive words being used in a communicative context. The results also indicate that no challenging behaviour was present during the sessions. The staff were pleased to note that the young man was able to clap to express pleasure, a behaviour that lasted for over a year.

The next part of this section describes the research applications of three studies. These studies were necessarily small-scale, because it is challenging to find representative sample groups of individuals with PMLD and it can be difficult to find samples that conform to research evidence that relies heavily on case studies (Watson & Fisher, 1997). A variety of baseline methods were therefore employed as an alternative.

First evaluation

In this evaluation, Watson and Fisher (1997) selected six children with severe PMLD, aged between 10 and 19 years old. Ben[14], Chris, Anna, Sean, Theresa and Joseph attended a Scottish special school for children with severe disabilities, and often MD. The school staff felt that the children's school experience, which focused on a curriculum that primarily involved self-help and communication activities, was repetitive, predictable and not motivational since it involved insufficient social and emotional development. As a result, they decided to

---

[14] All pupils' names were changed by the researchers.

incorporate sessions inspired by the work of Nind and Hewett. They were primarily interested in whether the use of II created more advanced behaviour in the children, compared with their other experiences in the classroom.

The Pre-verbal Communication Schedule (PVCS) assessment demonstrated satisfactory reliability for assessing the existing non-verbal communication skills of the children at pre-verbal levels of development. The assessment was completed for the six children by practitioners who were familiar with them and who differed from their partners in the II sessions. The assessment concerned their class activities and scored their typical communicative behaviour by describing aspects of their communication listed in a test with the responses 'yes-no', 'usually', 'rarely', or 'never'.

This evaluation focused on comparing the judgements of the PVCS assessment relating to the six children, with evidence from the videotaped II sessions with those same children. These sessions were conducted over approximately a six-week period, on up to six discrete occasions for each staff/pupil pairing. The classroom setting was videotaped, and the staff members employed their usual way of working using II. The responses of the assessment were then compared with the same behaviours during the II sessions.

The finding showed discrepancies between the results. The children were frequently marked during the II sessions and, if more social or communicative behaviours were not observed, they were judged to 'never' or 'rarely' occur in the PVCS. As the researcher explains, it was clear that

Ben's giving of the ball to his teacher on request occurred reliably in the later II sessions. He also cued the end of the session by looking at the door and moving towards it holding his teacher's hand. Ben's co-operative play initiatives with the nursery nurse frequently involved giving her an object. He began to call her by name; this did not happen with other pupils or other members of staff. Joseph's behaviour during II also appears to be more advanced than that seen in the classroom according to the PVCS assessment. He was found to release objects efficiently, and his 'eeh' vocalisation appeared to be related to his paying attention to objects or activities quite reliably, as when spotting his favourite car. (Watson & Fisher, 1997, p.81)

This evaluation study concludes that comparison between baseline judgements and videotape evidence suggests that the use of II provided a context that facilitated IC, which assisted the practitioners to interpret and optimally respond to the child.

Second Evaluation

Watson and Fisher's (1997) research was also selected for the second evaluation since it provided further support for the particular effectiveness of using II with younger pupils with severe PMLD. The participants in the evaluation were Colin, Katy, Martin, Norman, and Stuart[15], five students with PMLD in teacher-researcher Anne Fisher's class. The evaluation, performed over a nine-month period, concerned whether II experiences can produce more advanced levels of communication compared with other school experiences, such as teacher-directed group activities with specifically identified goals planned and directed by the teacher, and designed to encourage specific social skills. Both methods were studied over the research period.

The study consisted of two processes. The participants included the teacher, an occupational or speech therapist, a nursery nurse, classroom assistants and parents. In the II sessions, each carer was assigned to work with the same child for two half-hour sessions per week. The length of the sessions varied depending on the pupils' engagement. In staff-directed groups, specific goals were involved in the planned activities, which were controlled by the teacher in 30-minute sessions, three times a week. During the group session, the staff worked coactively with the children, facilitating their movements to enable them to participate in all aspects of the programme. In addition to five video recordings for each pupil, recording sheets were completed after every group and II session. A professional familiar with II, but who had no prior knowledge of the children, then analysed extracts from each video session, selected by a member of staff. Furthermore, the staff involved were interviewed at the end of the research period to collect qualitative data on all five pupils.

The findings show that the children made limited progress. Despite the practitioners' attempts to adjust the children's positioning to enable the pupils to interact with their peers in the staff-directed group sessions, the children made limited progress, producing only a small number of responses and remaining passive recipients. During the II sessions, however, there was evidence that all of the children demonstrated higher levels of control of their environment.

For example, one subject, Martin, was described as having 'Cerebral Palsy – quadriplegia, extensor spasms, left scoliosis, increased tone in all limbs, does not weight-bear, can roll back to side, no active grasp, profound and complex learning difficulties' … Martin had poor vision but was sensitive to light, and despite being non-verbal, could communicate through crying (Watson & Fisher, 1997, pp.85-86). The researchers explained that Martin spent much of his time withdrawn, resisted handling, and was difficult to 'bring out of himself' (ibid. pp.85-86).

Martin's teacher, Anne, knew him from the start of the academic year, when Martin exhibited passive, unresponsive behaviour. Researchers state that 'to begin with, sessions between Martin and Anne involved him sitting on her knee. She would sign to him, move his

---

15 These names were changed by the researcher.

hands and legs bounce him on her knee or blow raspberries on his face and hands. He occasionally smiled slightly but kept his eyes closed. Later he began to open his eyes…and when he closed them, Anne interpreted this as a signal that he did not want to continue.' (Watson & Fisher, 1997, pp.85-86).

Anne was particularly receptive, noticing Martin's signals and responding appropriately;

1. The II sessions demonstrated consistent development, for example:
'He began to reach out to touch her face and, if anyone entered the room or there was loud noise outside the room, Martin would shut off and the session had to be concluded. This pattern continued with Martin's movements becoming quicker and more pronounced. Anne began to allow more time for him to continue or to cease these movements, and allowed him to take the lead. By now Martin was more tolerant of disturbances but only from other familiar staff. He then began to show signs of initiating games through arm and leg movements and his increased interest in Anne was shown by giving and maintaining eye contact' (ibid. pp.85-86) .

2. In the II sessions, increased engagement was apparent when situations were rewarding for both parties, for example:
'Sessions continued with Martin gaining more confidence and trust in his teacher, and actions, timing and pace were all set by him. The type of interactions and sessions varied according to his mood…He communicated his wishes through smiling, eye contact or body gestures (for example) and came closer for a cuddle. Sessions were terminated when Martin avoided eye contact, or stopped participating' (ibid. pp.85-86).

3. Anne was able to interpret Martin's behaviour and give optimal responses, for example:
'Turn-taking sequences and imitative mouth movements began to emerge. Sessions were enjoyable and satisfying for both Martin and Anne, and could by the end of the research study be carried out in the presence of others as an interruption did not now terminate the session. He would continue to keep his eyes open, and might even glance at the person in question and the session would resume when they had left' (ibid. pp.85-86).

4. Martin understood that he was the leader in the conversation, for example:
'Martin determined what was going to happen with Anne responding to his wishes and he terminated the session when he was ready' (ibid. pp.85-86).

5. The interactive styles unique to Martin gave him new enjoyable experiences to share with Anne, for example:

'Martin was introduced to toys. His bright facial expression indicated his pleasure and he began to attend to the toy, look towards Anne to share his pleasure and to operate the toy again. He would kick his legs and his arm movements were interpreted as an attempt to touch and operate the toy…when he heard the noise, he would reach out; this movement could result in his whole body rolling to the side but when brought back to midline, he relocated the toy and tried again; each movement reaching a little further until he touched it, when Anne's contingent response was to operate the toy' (ibid. pp.85-86).

6. This intervention added new skills for Martin, for example:
'Martin has changed from the little boy who withdrew from any social or physical contact, physically resisting and disengaged and his most noticeable developments were an increasing tolerance of handling and maintaining eye contact and physical control over his movements including reaching, pushing, lifting his head and improving his posture. He learned to take control…He developed an understanding of cause and effect in relationships' (ibid. pp.85-86).

The study concludes that II enabled these children – usually described as entirely dependent – to be meaningfully involved in their social world. Children played a more passive role in other class activities, confirming to staff that the II sessions should continue within the curriculum, particularly the physical contact and play.

Third Evaluation

This evaluation was conducted by Kellett (2003) and explores the progress made by Jacob, a young boy with severe PMLD. It discusses his outcome for the use of II as a teaching approach. Jacob[16] was one of six children who participated in a longitudinal research study designed to evaluate the effect of II. The duration of the project was 18 months, and was conducted in three special schools. The study used multiple method qualitative and quantitative data. A coding system of behaviour between Jacob and the interacting partner was employed to measure progress via video recording.

As in previous studies, one way of evaluating II, as Kellett (2003) explains, is by implementing the approach with one group of children and not with another, then drawing comparisons between them regarding the progress made. However, the complex nature of the children's disabilities reduces the viability of obtaining a representative group. Alternatively, it is possible to utilise a 'reversal phase', in which the approach is adopted and developments measured; the approach is then withdrawn, and the child's progress is monitored to assess

---

[16] These names were changed by the researcher.

whether the development ceases or disintegrates. Kellett (ibid.) rejects this model, however, because of his concerns that it would be unethical to withdraw an approach thought to be beneficial to determine its effectiveness. Instead, in this evaluation, the researcher employed a model wherein Jacob was allocated different durations of a baseline phase and commencement of the intervention was staggered at different points, an approach known as the multiple baseline interrupted time series. If Jacob made progress after the intervention, it would strengthen any relationship between this progress and the adoption of an II approach.

The following section outlines the range of findings for the baseline assessment phase, the intervention phase and the results of the staff interviews.

The baseline assessment phase: For five weeks, Jacob remained on the baseline, which was shown by four data points. For a further 42 weeks, he participated in II, which was shown by 15 data points. During the baseline phase, Jacob's one-to-one interactive sessions were initially filmed at intervals over the five weeks. These interactions did not employ any of the II principles or procedures.

Jacob achieved 14.3% of the pre-verbal communication descriptors at the beginning of the baseline phase, and this figure remained unchanged after the baseline period. Jacob's abilities had increased to 16.6% on The Preverbal Communication Schedule (PCVS) when the first intervention probe assessment was conducted after five weeks. At the end of the study, this amount had increased to 56.6%.

In a reimagining of Brazelton's (1984) 'Cuddliness Scale', the Physical Sociability Scale was also employed to measure physical sociability as a means of communication. The baseline scores demonstrated that Jacob neither resisted nor participated in social physical contact, remaining entirely passive in this regard. Following five weeks of II, the intervention probe showed that his abilities in this area had improved, and Jacob's score on the scale had climbed, demonstrating that he usually relaxed and moulded when first held. By the end of the study, Jacob was initiating social physical contact, situating him at the top of the scale. Figure 1 illustrates Jacob's progress.
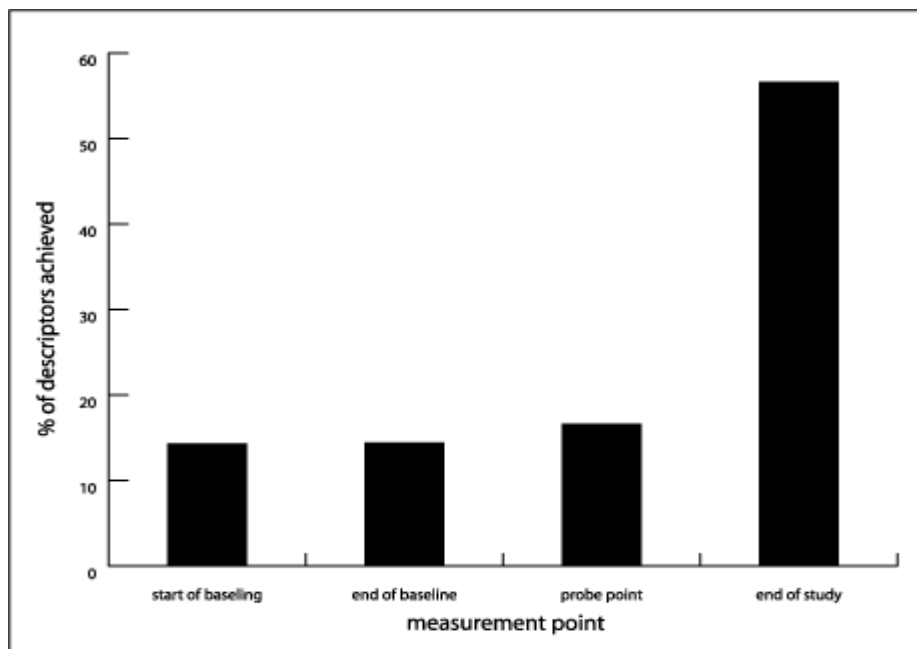

Figure 1 (Kellett, 2003)

In the baseline phase, the percentage incidence of Jacob not interacting on any level was 82.9%. This level of interaction was reflected in the comments made by the staff regarding Jacob's social isolation throughout the day, in which they identified that he engaged in stereotyped activity of many different forms, and did not attempt to interact with his peers or with staff members.

The II phase: Forty-two weeks of II intervention followed the baseline phase, with interaction behaviours recorded from each five-minute video, such as 'eye contact, looking at face, social physical contact, joint attention, engagement, and reduced stereotypical activity' (Kellett, 2003, p.19). These interaction behaviours were coded according to complexity on a per-second basis.

Kellett (2003) explains that initially, maintaining Jacob's focus was challenging, due to the high frequency of stereotyped behaviours. Emma, the staff member working with Jacob, 'responded to the slightest action…with an imitation', seating Jacob on her knee in face-to-face contact (Kellett, 2003, p.19). Over time, Emma developed a game with Jacob, and as Kellett states, 'soon he was initiating the game by taking hold of Emma's hands…Emma introduced 'tension and anticipation' into the game by holding his arms in the air and holding her breath dramatically' (Kellett, 2003, p.19). The game continued with increasing involvement from Jacob. In the intervention phase, the average rate of no interactive behaviours dropped to 11.6%. The data presented in Table 1 illustrates Jacob's progress.

Table 1

IC behaviours	Intensive Interaction Approach Intervention
Looking at Face	The first social behaviour to emerge during the II sessions was Jacob's looking either towards or at Emma's face. As soon as the intervention began, there seemed to be an instantaneous change, indicated by the increase to 75.7% after the first week of II. This change was echoed in week 26 by a second climb to 85% following the reintroduction of II after an11-week gap during which Emma was unwell. Losing 11 weeks of II sessions was detrimental, and staff believed Jacob was 'pining' for these sessions. This outcome has implications for how the intervention is executed in schools, and a team-based approach is encouraged to reduce the chance of any interruption, such as that which occurred in Jacob's case. Notwithstanding, the average occurrence of looking at or towards Emma's face rose to 48% in the intervention phase, from just 8.4% in the baseline phase.
Joint Focus Activity	An additional coded behaviour that exhibited timely and continued development was the ability to attend to a joint focus. This incidence noticeably increased from an average of 3.7% in the baseline phase to an average of 65.5% during II.
Reciprocal Social Physical Contact and Eye contact	Two coded behaviours that took somewhat more time to materialise were eye contact and the creation/continuation of social, physical contact (e.g. initiating or responding to hugging or hand touching). Despite the length of time taken for these behaviours to appear, this progress is even more significant because both of these socially interactive behaviours were entirely missing from Jacob's communicative range before the start of II. It is worth mentioning that these two social behaviours which took the longest time to appear have also been shown to take longer to re-emerge following teacher absence.
Engagement	Engagement was assessed as being a quality, focused state when Jacob was completely preoccupied or 'engaged' in his interaction with Emma. Here, the average incidence is 46.4% during the intervention phase compared with 2.6% in the baseline phase, providing a clear endorsement.
Stereotypical Behaviours	Jacob engaged in stereotypical behaviours throughout significant portions of the school day. These behaviours were coded into three categories. The first of these is ritualistic finger play, the second is hand biting, and the third is rocking (occasionally accompanied by banging the head or elbow on hard surfaces). Increased social interaction is possible following a reduction of such stereotypical behaviours. It is crucial to make clear that, in the II sessions, Jacob substituted stereotypical behaviours with more socially communicative behaviours due to these new behaviours gaining greater reward.

The staff observations provide a further important source of data collection, as they took place during the events that were not covered in the video footage. One such example was:

"Emma's description of how Jacob learned to speak his first word, yum. She described how they would play games at refreshment time. In these teasing, anticipation games Emma would recite yum yummy yum yum as part of the game repertoire. After a few weeks of using this phrase, Jacob began to smack his lips and uttered his very first word yum." (Kellett, 2003, p.15)

Another example took place during snack time:

"A drink and a handful of raisins had been put on the table in front of Jacob. It was common practice that a member of staff would feed these to Jacob because he did not have the fine motor control to pick up the raisins or control the beaker. The member of staff was called away to deal with a more pressing matter. Meanwhile, Jacob tried to pick up the raisins himself, and although he frequently got one in range of his fingers, he could not manage to pick one up. He became increasingly frustrated by this lack of success and started to rock and wail in distress. When this failed to gain the attention of the busy member of staff, Jacob's wailing began to be punctuated with yum yum … yum yum … yum." (ibid. p.15)

The researchers also discussed with staff and researchers showed an agreed acknowledgement of the immense progress Jacob had made since the commencement of II, from being a child who was hard to reach, to an interactive child who took part in joint activities. They explained that his self-injurious behaviours vanished, and his stereotyped behaviours were greatly reduced. He also became aware of the environment around him, and able to participate in activities within a group. Staff also demonstrated that Jacob became a happier child, exhibiting delightfully humorous characteristics, not previously observed in him. Furthermore, he made exceptional progress in his ability to express his needs.

This evaluation concluded that Jacob became less interested in stereotyped behaviour and more interested in his interactions with Emma. He would scrutinise her face and engage in eye contact exchanges and on occasions even stroke Emma's hand or face. If he became self-involved in finger flapping, Emma would turn the finger play into something interactive, like a finger game such as 'Round and round the garden'. Emma's skill lay in her finely-tuned contingent responses that enabled her to detect the slightest attempt at communication by Jacob, to interpret it as being intentional, and to reflect it back to him in a mutually pleasurable exchange.

CONCLUSION AND SYNTHESIS

This article has demonstrated that children with PMLD encounter obstacles to IC not just as a result of PMLD, but also as the unresponsive environments that limits their interaction. This article summarises II as an approach for IC with children with PMLD; as such children should be enabled to find their ways to express themselves and to be aware of their surroundings. As illustrated by recent research concerning II, technique views the child with PMLD not a passive partner, but as a socially proactive one. This approach then should be adopted by the KSA's education system through instigating further practical research, as II can make an important contribution to the school curriculum for all children who do not have the opportunity to develop IC abilities.

REFERENCES

Aljaser, K (2010) Identification and Development of Communication Interaction for Children with Profound and Multiple Learning Disabilities in the School Setting, focusing on Bronfenbrenner Biological Model (Un publish Master Dissertation). University of Leeds. United Kingdom.

Argyropoulou, Z. & Papoudi, D. (2012) The training of a child with autism in a Greek preschool inclusive class through intensive interaction: a case study, *European Journal of Special Needs Education,* 27 (1), 99-114.

Arid, R. (2001) *The Education and Care of Children with Severe, Profound and Multiple Learning Difficulties.* London: David Fulton.

Barber, M. (2007) Imitation, interaction and dialogue using Intensive Interaction: Tea party rule. *Support for Learning,* 22 (3) 124-130.

Barber, M. (2008) Using Intensive Interaction to add to the palette of interactive possibilities in teacher-pupil communication, *European Journal of Special Needs Education,* 23 (4), 393-402.

Bellamy, G,. Croot, L,. Bush, H & Smith, A (2010) A study to define: profound and multiple learning disabilities (PMLD). *Journal of Intellectual Disabilities,* 14 (3) 221-235.

Bloomberg, K., West, D & Johnson, H. (2005) InterACtion- Strategies for intentional and unintentional communicators. *PMLD LINK.* 17(1) 50.

Bradley, H. (1998) Assessing and Developing Successful Communication' In P. Lacey & C. Ouvry (Eds) *People with Profound and Multiple Learning Disabilities: a Collaborative Approach to Meeting Complex Needs.* London: David Fulton.

Bradshaw, J. (2001) Communication Partnership with People with Profound and Multiple Learning Disabilities, *Tizard Learning Disability Review.* 6 (2) 6-15.

Brown, N., McLinden, M. & Porter, J., (1998) Sensory needs. In Lacey, P. & Ouvray, C. (Eds.) *People with profound and multiple learning disabilities: a multidisciplinary approach to meeting complex needs.* London: David Fulton.

Bunning, K. (2009) Making sense of communication. In Pawlyn, J. and Carnaby, S. (Eds.) *Profound Intellectual and Multiple Disabilities: Nursing Complex Needs.* Oxford: Wiley-Blackwell.

Caldwell, P., & Horwood, J. (2008) *Using intensive interaction and sensory integration: A handbook for those who support people with severe autistic spectrum disorder.* London: Jessica Kingsley Publishers.

Cameron, L. & Bell, D. (2001) Enhanced Interaction Training, *Working with People who have a Learning Disability,* 18 (3) 8-15.

Corke, M. (2012). *Using Playful Practice to Communicate with Special Children.* Hoboken : Taylor & Francis.

Crawford, J., Brockel, B., Schauss, S., & Miltenberger, R. G. (1992) A comparison of methods for the functional assessment of stereotyped behavior in persons with mental retardation. *Journal of the Association for Persons with Severe Handicaps, 17* (2) 77–86.

Demetriou, A., & Spanoudis, G. (2017) Mind and intelligence: Integrating developmental, psychometric, and cognitive theories of human mind. In R, Monica; Y, Kajsa and W, Ulrika. *Cognitive Abilities and Educational Outcomes* (pp. 39-60). Springer International Publishing.

Detheridge, T. (1997), Bridging the Communication Gap (for Pupils with Profound and Multiple Learning Difficulties). *British Journal of Special Education.* 24 (1) 21-26.

Elgie, S. & Maguire, N. (2001) Intensive Interaction with a woman with multiple and profound disabilities: a case study, *Tizard Learning Disability Review*, 3 (6) 18-24.

Elgie, S., & Maguire, N. (2001) Intensive Interaction with a Woman with Multiple and Profound Disabilities: A Case Study. *Tizard Learning Disability Review,* 6, 18-24.

Farrell, M. (2006). Celebrating the Special School. London: David Fulton.

Firth, G., Elford, H., Leeming, C., & Crabbe, M. (2007). Intensive Interaction as a Novel Approach in Social Care: Care Staff's Views on the Practice Change Process. *Journal of Applied Research in Intellectual Disabilities.*

Fogel, A. (1993) Two principles of communication: co-regulation and framing. In: Nadel, J. and Camaioni, L. (eds) *New Perspectives In Communication and Development.* London: Routledge.

Fraser, C. (2011) Can adults on the autism spectrum be affected positively by the use of intensive interaction in supported living services?, *Good Autism Practice*, 12 (2) 37-42.

Frederickson, N., Cline, T. (2009), Special Educational Needs, Inclusion, and Diversity. Buckingham: Open University Press.

Goldsmith, J., Goldsmith, L. (2007), 'Postural Care' In J Rennie (Ed.) Learning Disability: Physical Therapy Treatment and Management. Chichester: John Wiley.

Graham, J., (2004) Communicating with the uncommunicative: music therapy with pre-verbal adults. British Journal of Learning Disabilities, 32 (1) 24-29.

Grove, N., Bunning, K., Porter, J. and Morgan, M. (2000) *See what I mean: Guidelines to aid understanding of communication by people with severe and profound learning disabilities.* Kidderminster: BILD & Mencap.

Goldbart, J. (1994) Opening the communication curriculum to students with PMLDs', In J. Ware (Ed.) *Educating Children with Profound and Multiple Learning Difficulties.* London: David Fulton.

Hanna-Trainor, L., Taggart, L., & Cousins, W. (2016) Supporting the Physical Health Needs of People with Learning Disabilities. *Supporting the Physical Health Needs of People with Learning Disabilities: A handbook for professionals, support staff and families*, 320-398.

Hewett, D and Nind, M (1998) Commentary One: Practice and Progress' in D, Heweet and M, Nind (Eds) Interaction in Action. London: David Fulton.

Hewett, D, Barber, M, Firth, G and Harrison, T (2012) The Intensive Interaction Handbook. SAGE: London.

Hewett, D. 1995, Challenging Behaviour. Coursebook: Module 2 Unit 4 'Interdisciplinary Work with People with Profound and Multiple Learning Difficulties', The University of Birmingham School of Education.

Hogg, J., Sebba, J. & Lambe., L (1990) *Profound retardation and multiple impairment 3. Medical and physical care and management* V3. London: Chapman and Hall.

Imray, P. (2008) *Turning the tables on challenging behaviour: a practitioner's perspective to transforming challenging behaviours in children, young people and adults with SLD, PMLD or ASD.* London: Routledge.

Jones, K. & Howley, M. (2010*)* An investigation into an interaction programme for children on the autism spectrum: outcomes for children, perceptions of schools and a model for training, *Journal of Research in Special Educational Needs,* 10 (2) 115-123.

Jones, P. (2005) Teachers' Views of their Pupils with Profound and Multiple Learning Difficulties. *European Journal of Special Needs Education.* 20, 375-385.

Jones, R. & Williams, H. (1998) Reducing Stereotyped Behaviour: an experimental analysis of Intensive Interaction', *International Journal of Practical Approaches to Disability,* 22 (2/3) 21- 25.

Kellett M. (2004) Intensive Interaction in the inclusive classroom: using interactive pedagogy to connect with students who are hardest to reach, *International Journal of Research & Method in Education*, 27 (2) 175–88 .

Kellett, M and Nind, M (2008) *Implementing Intensive Interaction in School: Guidance for practitioners, managers and coordinators.* David Fulton Publish: London.

Kellett, M. (2000) Sam's story: evaluating Intensive Interaction in terms of its effect on the social and communicative ability of a young child with severe learning difficulties. *Support for Learning,* 15 (4) 165-171.

Kellett, M. (2003) Jacob's Journey: developing sociability and communication in a young boy with severe and complex learning difficulties using the Intensive interaction teaching approach, *Journal of Research in Special Educational Needs,* 3 (1) 111-435.

Kellett, M. (2005) Catherine's Legacy: social communication development for individuals with profound learning difficulties and fragile life expectancies', *British Journal of Special Education*, 32 (3), 116-121.

Lacey, P., Ashdown, R., Jones, P., Lawson, H. & Pipe, M. (2015) *The Routledge companion to severe, profound and multiple learning difficulties.* Abingdon, Oxon New York, NY: Routledge, Taylor & Francis Group.

Leaning, B. & Watson T. (2006) 'from the inside looking out – an Intensive Interaction group for people with profound and multiple learning disabilities', *British Journal of Learning Disabilities*, 34, 103-109

Lloyd E. M. (2015) Intensive Interaction in the mainstream classroom: evaluating staff attitudes towards an inclusive socio-communicative intervention, *Good Autism Practice*, 16 (2) 49-68.

Lovell, D.M., Jones, R.S.P. and Ephraim, G. (1998) The effect of Intensive Interaction on the sociability of a man with severe intellectual disabilities', *International Journal of Practical Approaches to Disability.* 22 (2/3) 3-9.

Male, D., B., Rayner, M., (2007) Who Goes to SLD Schools? Aspects of Policy and Provision for Pupils with Profound and Multiple Learning Difficulties who Attend Special Schools in England, *Support for Learning.* 22 (3) 145-52.

Mednick, M. (2007) *Supporting Children with Multiple Disabilities.* London: Continuum.

The KSA Ministry of Education, Access 2016 from https://www.moe.gov.sa/en/Pages/default.aspx

Murdoch, H. (1997) Stereotyped Behaviours: How Should We Think about Them?. *British Journal of Special Education,* 24 (2) 71-75.

Nind, M. & Hewett, D. (1988) Interaction as Curriculum.' *British Journal of Special Education.* 15 (2) 55-57.

Nind, M. & Hewett, D. (1994) *Access to communication: Developing the basics of communication with people with severe learning difficulties through intensive interaction.* London: David Fulton.

Nind, M. & Hewett, D. (2001) *A Practical Guide to Intensive Interaction.* Kidderminster: British Institute of Learning Disabilities.

Nind, M. & Hewett, D. (2005) *Access to Communication: Developing the basics of communication with people with severe learning difficulties through Intensive Interaction.* London: David Fulton.

Nind, M. & Powell, S. (2000) Intensive Interaction and autism: some theoretical concerns, *Children and Society*, 14 (2) 98-109.

Nind, M. (1996) Efficacy of Intensive Interaction: Developing sociability and communication in people with severe and complex learning difficulties using an approach based on the caregiver-infant interaction. *European Journal of Special educational Needs.*11 (1) 48-66

Nind, M. (1999) Intensive Interaction and autism: a useful approach?, *British Journal of Special Education*, 26 (2) 96–102.

Nind, M., & Kellett, M. (2002) Responding to individuals with severe learning difficulties and stereotyped behaviour: challenges for an inclusive era. *European Journal of Special Needs Education,* 17 (3) 265-282.

Nind, M., (2007) Supporting lifelong learning for people with profound and multiple learning difficulties. *Support for Learning,* 22 (3) 111-115.

Pawlyn, J. (2009) Achieving and Maintaining Health. In Pawlyn, J. and Carnaby, S. (Eds.) *Profound Intellectual and Multiple Disabilities: Nursing Complex Needs*. Oxford: Wiley-Blackwell.

Pickles, P. A. C. (2004) *Inclusive Teaching, Inclusive Learning Managing the Curriculum for Children with Severe Motor Learning Difficulties*. London: David Fulton.

Porter, J., Ouvry, C., Morgan, M., & Downs, C. (2001) Interpreting the communication of people with profound and multiple learning difficulties. *British Journal of Learning Disability*, 29(1) 12-16.

Ross E. & Oliver C., (2002). The relationship between levels of mood, interest and pleasure and 'challenging behaviour' in adults with severe and profound intellectual disability. *Journal of Intellectual Disability Research*, 46 (3) 191-197.

Rowland, C., & Schweigert, P. (1993) Analyzing the Communication Environment to Increase Functional Communication. *Journal of the Association for Persons with Severe Handicaps,* 18 (3) 161-76.

Samuel, J., Nind, M., Volans, A. & Scriven, I. (2008) 'An evaluation of Intensive Interaction in community living settings for adults with profound intellectual disabilities, *Journal of Intellectual Disabilities,* 12 (2) 111-126 .

Sharma, V. & Firth, G. (2012) Effective engagement through Intensive Interaction, *Learning Disability Practice*, 15 (9) 20-23.

Siegel-Causey, E and Wetherby, A (1993) Nonsymbolic communication', In Snell M.E. (Ed.) Instruction of Students with Severe Learning Disabilities. New Jersey: Merril.

Simmons, B., & Watson, D. (2014) *The PMLD Ambiguity: Articulating the Life-Worlds of Children with Profound and Multiple Learning Disabilities*. London : Karnac Books.

Simmons, B., Bayliss, P. (2007) The Role of Special Schools for Children with Profound and Multiple Learning Difficulties: Is Segregation Always Best?, *British Journal of Special Education*. 34, 19-24.

Sobsey, D. & Wolf-Schein, E., G., (1991) Sensory Impairment In F. Orelove & D. Sobsey (Eds) Educating Children with Multiple Disabilities. A Transdisciplinary Approach. London: Paul H Brookes.

Trevarthen, C (2008) Intuition for Human Interaction. In M.S. Zeedyk, (Ed.) *Promoting social interaction for individuals with communicative impairments*. London: Jessica Kingsley.

Ware, J. (2003) *Creating a Responsive Environment for People with Profound and Multiple Learning Difficulties*. London: David Fulton Publishers.

Ware, J. (2004) Ascertaining the view of people with profound and multiple learning disabilities. *British Journal of Learning Disabilities*. 32, 175-179.

Watson, J. & Fisher A. (1997) Evaluating the Effectiveness of Intensive Interactive teaching with pupils with Profound and Complex Learning Difficulties, *British Journal of Special Education,* 24 (2) 80-87.

Watson, J. & Knight, C. (1991) An Evaluation of Intensive Interaction Teaching with pupils with Severe Learning Difficulties. *Child language, Teaching and Therapy*, 7 (3) 10-25 .

Zeedyk, M. S., Caldwell, P., & Davies, C. E. (2009) How Rapidly Does Intensive Interaction Promote Social Engagement for Adults with Profound Learning Disabilities?. *European Journal of Special Needs Education,* 24 (2) 119-137.