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Engagement of Children with Autism in Learning

Deb Keen

Faculty of Education, Griffith University

and

Griffith Institute for Educational Research

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Abstract

Early engagement with the world around us provides opportunities for learning and practising new skills and acquiring knowledge critical to cognitive and social development. Children with autism typically display low levels of engagement, particularly in their social world, which limits the opportunities for learning that occur for their typically developing peers. An investigation of the literature on engagement suggests a lack of consensus about definition and measurement that may undermine the usefulness of this construct to educators. This paper argues that the engagement construct can assist educators in the development and implementation of effective teaching interventions for children with autism.

KEY WORDS: autism, engagement, teacher responsiveness, learning and motivation

Engagement of Children with Autism in Learning

The concept of engagement is one that is considered in many different contexts from schooling through to the workplace. In an educational context, the notion of school engagement has been of increasing interest as schools grapple with issues of student academic achievement, motivation, and drop-out rates (Alexander, Entwisle, & Horsey, 1997; Mahoney & Cairns, 1997). According to the school engagement literature, engagement is one of the best predictors of positive student outcomes (Logan, Bakeman, & Keefe, 1997). For children in the early years, researchers have identified high quality engagement with the environment as a mediating variable in young children's learning (McWilliam & Bailey, 1992, 1995).

Children with developmental disabilities spend less time actively engaged with adults and peers, and less time in mastery-level engagement with materials than do children without disabilities (McWilliam & Bailey, 1995). There is general agreement, however, that children with autism are more passive and have higher levels of non-engagement than their peers with other kinds of disabilities (Corsello, 2005; Kishida & Kemp, 2006; Warren & Kaiser, 1986; Wimpory, Hobson, Williams, & Nash, 2000). When engaged, they are more likely to be self absorbed or engaged with objects rather than with people. These low levels of engagement, particularly with the social world, mean that there arise fewer opportunities for these children to learn and practise new skills while interacting with objects and people in their environment. The cumulative effect of low engagement and limited opportunities to learn and practise skills can have serious consequences for a child's development (Hart & Risley, 1995).

While there seems to be general agreement in the literature that children with autism have difficulties engaging with their physical and social worlds, a shared

meaning or conceptual understanding about engagement and its measurement is lacking. In the absence of a common understanding of engagement and its measurement, the question can be raised as to whether this construct is a useful one to educators in their efforts to improve the learning outcomes of children with autism. This paper argues that the engagement construct can assist educators in the development and implementation of effective teaching interventions for children with autism.

There appears to be general agreement in the literature that engagement is a multidimensional construct that includes behavioural, emotional, and cognitive components (Connell, 1990; Connell & Wellborn, 1991; Fredricks, Blumenfeld, Friedel, & Paris, 2002; Fredricks, Blumenfeld, & Paris, 2004). Behavioural engagement refers to participation or involvement in learning activities and is related to on-task behaviour, while emotional engagement refers to the child's interest in the activities. Cognitive engagement can best be described as the child's eagerness or willingness to acquire and accomplish new skills and knowledge and relates to goal-directed behaviour and self-regulated learning (Fredricks, Blumenfeld, & Paris, 2004).

Behavioural Engagement

A review of the literature on engagement and autism suggests that attention is more frequently given to behavioural engagement. This tendency may reflect the influence of applied behaviour analysis on the development of interventions for children with autism (Lovaas, 1987). In particular, engagement is commonly chosen as a dependent variable in studies that have investigated the effects of specific instructional and environmental factors in learning. Factors that have been found to increase engagement for children with a disability, some of whom may have a

diagnosis of autism, include activity schedules (O'Reilly, Sigafoos, Lancioni, Edrisinha, & Andrews, 2005), offering choice (Realon, Favell, & Lowerre, 1990; Reinhartsen, Garfinkle, & Wolery, 2002; Watanabe & Sturmey, 2003), use of preferred items (Blair, Umbreit, & Bos, 1999; Endicott & Higbee, 2007; Morrison & Rosales-Ruiz, 1997), adult responsiveness (J. Kim & Mahoney, 2004; O. Kim & Hupp, 2005; Kishida & Kemp, 2006; Mahoney & Wheeden, 1999), group size (Logan, Bakeman, & Keefe, 1997; Sandstrom Kjellin & Granlund, 2006; Sigafoos et al., 2006), and self-monitoring (Shearer, 1996). All these studies share in common a focus on child engagement but differ from each other in the way engagement is defined and measured.

Instructional Strategies

Studies investigating the effects of specific instructional strategies have generally used behavioural definitions of engagement that take account of the individual's 'on-task' behaviour, and measures often involve some form of time sampling. For example, O'Reilly et al. (2005) investigated the effects of an individualised schedule of activities on levels of engagement and self-injury for a 12-year-old student with severe autism. Engagement was defined as the child being actively and appropriately involved with instructors or items and was measured using a 10 second whole interval procedure. The implementation of the activity schedule within the context of the child's normal curriculum led to reduced self-injury and increased engagement. Activity schedules were also used in a study by Watanabe and Sturmey (2003) in an evaluation of the effects of choice-making opportunities which were embedded within activity schedules for three adults with autism in a community vocational setting. Engagement was defined as the participants being on task and was measured using a momentary time sampling procedure. This study found that

engagement was substantially higher when choice-making opportunities were embedded within activities.

Environmental Influences

Environmental influences on child engagement have also been investigated and definitions and measures of engagement in these studies tend to differ from those used in the studies reported above. McWilliam and colleagues have been active in this area of research and have defined engagement as the amount of time children spend actively or attentively interacting appropriately with their environment at different levels of competence (McWilliam & Bailey, 1992). This conceptualisation of engagement takes account of the ‘type’ of engagement (for example, with peers, objects, other adults, or self), and ‘levels’ of engagement, which relate to the complexity of the child’s behaviour.

Engagement in these studies is typically measured through behavioural observation and a number of tools have been developed to assist researchers and clinicians in measuring child engagement. The Engagement Quality Measurement System III or E-Qual III is one such measure (McWilliam & de Kruif, 1998) that identifies nine levels of engagement ranging from nonengaged to more complex forms of engagement referred to as differentiated and symbolic behaviour. These rating systems are complex and require extensive training in order for raters to become reliable in their use.

In addition to measures of the child’s engagement, tools have also been developed to measure environmental variables such as adult responsiveness and environmental arrangement that may influence child engagement. Measures of teacher and parent interactive styles, for example, have been used to examine levels of adult responsiveness and directiveness (Mahoney et al., 1999; Mahoney & Wheeden, 1999;

McWilliam, Zulli, & de Kruif, 1998). More general measures of the environment include such tools as the Ecobehavioral System for Complex Assessment of Preschool Environments (ESCAPE) (Greenwood, Carta, & Dawson, 2000) and the Early Childhood Environment Rating Scale Revised (ECERS-R) (Harms, Clifford, & Cryer, 1998). These assessment systems often include a measure of child engagement in addition to a range of other environmental variables. Once again, as with the E-Qual III, these systems can be complex and time consuming to administer.

Findings from studies of environmental determinants of engagement suggest that engagement may increase when caregivers are more responsive and less controlling or directive (J. Kim & Mahoney, 2004). Responsiveness may include allowing the child to choose what he/she will do, following the child's lead, or sharing in the child's focus of attention. Evidence of a more directive approach would be adult-selected activities, giving the child directions, and redirecting the child away from his/her focus of attention. Studies investigating the relationship between engagement and responsiveness have often focused on free play situations in home, childcare, and preschool settings (J. Kim & Mahoney, 2004; O. Kim & Hupp, 2005; Mahoney & Wheeden, 1999). Free play can provide many opportunities for adults to be responsive to the child by allowing the child to select his/her own activities and to join with the child around his/her interests. Preschool programs that make use of the child's interests have also been found to result in higher engagement levels than programs relying on highly structured formal instruction methods (McGee, Morrier, & Daly, 1999; McWilliam & Bailey, 1992).

While a more responsive, child directed approach has been advocated in the research literature, some intervention programs for children with autism encourage a more structured and adult-directed instructional model (Lovaas, 1987; Smith, Groen,

& Wynn, 2000). One reason for this is that a less directive, more developmental approach may fail to optimise learning because children with autism typically have low levels of interest in the physical and social world and low rates of initiation (Corsello, 2005; Warren & Kaiser, 1986). This can lead to a reduced number of naturally occurring or child-directed learning opportunities throughout the day. There is also research to suggest that adults are more directive with children who have autism, than with children who do not, in an attempt to adapt to the child's difficulties in attention and interaction (Watson, 1998).

Kishida and Kemp (2006) conducted a study in which they assessed levels of engagement in children with severe intellectual disabilities across a range of activity types. Engagement was measured using an observational measure called the Individual Child Engagement Record (Kishida & Kemp, 2006). One of the participants in the study, David, had a diagnosis of Autistic Disorder. Results showed that David, in contrast to the other children, had better access to learning during structured activities, systematically planned and led by a teacher, than during activities he was expected to initiate. Within this more structured and adult directed instructional model, however, there is little research available to guide teachers in the degree to which they should adopt a more responsive or directive style of interaction and how this may impact levels of engagement for children with autism.

Another key environmental variable that has been studied in relation to engagement is group size. Early intervention approaches for children with autism vary widely and may involve intensive, 1:1 instruction and/or group programs. Group size, and consequently, the staff-to-child ratio, is a variable that may impact on levels of child engagement.

A study conducted by the author on the engagement of children with autism serves to illustrate this point (Keen & Arthur-Kelly, 2009). In this study, six children with autism aged 3 to 5 years were observed with their teachers during periods of intensive instruction. Results showed that the mean level of engagement for all six children was low (ranging from 24-68%), and although these children were identified by staff as being very difficult to engage, the staff-to-child ratio was high (1:1). The levels of engagement also showed large fluctuations across sessions for most of the children (ranging from 20 to 90%).

These findings show some similarities with results from a recently published study by (Ruble & Robson, 2007) who measured levels of engagement of four children with autism and a comparison group of four children with Down syndrome. Only goal-directed behaviours were selected for analysis in this study and these behaviours were coded for engagement based on whether they demonstrated compliant engagement, congruent engagement, or both. A child who was involved in an activity willingly and without resistance was coded as compliant while congruent engagement concerned the degree to which the child's behaviour was consistent with that of the goals of his peers. Levels of engagement that were both compliant and congruent occurred around 39% of the time for children in both groups. However, children with autism showed more compliant engagement than the comparison group and lower levels of congruent engagement. This difference was particularly noticeable in 1:1 instructional settings which produced lower levels of engagement than small group settings. The children with autism also showed marked variability, particularly in congruent engagement which occurred between 14% and 74% of the time.

Taken together, these results warrant careful consideration of the effects of group size and staff-to-child ratios on levels of engagement for children with autism.

It would appear that intensive, 1:1 instruction may negatively impact the engagement of some children with autism but further research is needed to clarify the circumstances under which this may occur. Such research is important if we are to offer intervention approaches that maximise engagement in learning.

Emotional and Cognitive Engagement

As mentioned earlier, autism interventions that have gained strong empirical support have been strongly influenced by applied behaviour analysis (Odom, Collet-Klingenberg, & Rogers, in press). Emotional and cognitive engagement appear to be less frequently cited than behaviour engagement in the autism literature, perhaps because they are affected by factors often considered to be internal to the child and therefore from a behavioural perspective not directly observable or readily influenced by interventionists. The one aspect of emotional and cognitive engagement that has perhaps received the greatest attention and will be discussed below is motivation, which does draw in part from the behavioural literature.

Motivation

Difficulties in motivation have often been noted in the autism literature (R. L. Koegel & Mentis, 1985) and motivating children with autism has been central to some intervention approaches. For example, Robert Koegel and colleagues developed an intervention known as pivotal response training based on the hypothesis that the primary impairment in autism is a qualitative impairment in social communicative interactions (L. K. Koegel, Koegel, Harrower, & Carter, 1999; R. L. Koegel, Koegel, & McNerney, 2001). They argue that these impairments are evidenced by behaviours including lack of eye contact, lack of anticipatory movements, lack of head positioning, stereotypic movements, and unusual facial expressions. Pivotal response training aims to increase the child's motivation to engage in social communicative

interactions by motivating the child to initiate social interactions, self-regulate behaviour, and respond to complex interactions involving multiple cues. The authors argue that addressing what they refer to as the core impairment (i.e., social communicative interactions) can result in improvements in concomitant behaviours (e.g., self-stimulation, lack of responsiveness) not specifically targeted in intervention but that have an indirect relationship to this core impairment. The areas that are targeted through pivotal response training are components that feature commonly in definitions of engagement: motivation, responses to multiple cues, and self management and self-initiations.

Interestingly, the topic of motivation appeared in the writings of early theorists in the area of behaviour analysis but as noted by Jack Michael (1993) it all but disappeared by the late 1960s. He stated that “the present failure to deal with the topic leaves a gap in our understanding of operant functional relations” (p191). Since that time, interest in the concept of motivation seems to have gone through a resurgence with attention being given to an analysis of a class of antecedent variables referred to variously as setting events (Wheldall & Glynn, 1988), establishing operations (Michael, 1982, 1988, 1993, 2000), or motivating operations (Endicott & Higbee, 2007). Setting events are antecedent contextual variables that influence behaviour and may be internal (e.g., hunger) or external (presence or absence of objects) to the child.

According to Michael (1982), an establishing operation (EO) is something that either (a) increases the effectiveness of some object or event as reinforcement or (b) evokes the behaviour that has in the past been followed by that object or event. This is best illustrated in an example involving motivation associated with hunger. Food deprivation acts as an EO by temporarily increasing the effectiveness of food as a reinforcer. Food also momentarily increases the frequency of behaviours or responses

that have been previously reinforced with food. Food satiation acts as an EO but in reverse, decreasing both the effectiveness of food as a reinforcer and the frequency of behaviours that have been followed by food reinforcement.

Researchers have examined the effects of EOs on skill acquisition and generalisation for children with developmental disabilities (Brown et al., 2000; Drasgow, Halle, & Sigafos, 1999; Endicott & Higbee, 2007; McAdam et al., 2005). Studies by these researchers have shown that motivation is a critical ingredient of effective instruction and that motivational levels fluctuate over time. One of the reasons for these fluctuations is the influence of EOs which can change the value of a reinforcer and the probability of a particular behaviour or response occurring.

In addition to the focus on EOs, there has also been interest in studying ways of using a child's interests to increase motivation. One procedure that has been used to identify objects/activities for which the child shows interest is the use of preference assessments. A preference assessment involves presenting a child with a range of items and observing the child's behaviour to determine level of interest in the items. These items can then be ranked from most to least preferred.

For children with autism, this approach can be problematic for several reasons. First, a child's preferences have been found to shift constantly within and across teaching sessions (Dyer, 1989) and the child may rapidly reach satiation of an item/activity (DeLeon, Anders, Rodriguez-Catter, & Neidert, 2000). Second, the child may become fixated and/or engage with the materials in an obsessive and stereotypic way which has been found to impede learning (Bruckner & Yoder, 2007; Morrison & Rosales-Ruiz, 1997). This makes it difficult to honour the child's preferences or to use them in a productive manner during instruction.

As a result of the factors outlined above, a teacher may find that a child fails to engage in learning even though preference assessments are undertaken and preferred items are presented. Recommended practice in the assessment of individual preferences includes the use of repeated assessments to gauge changes in preferences over time and having a range of preferred items available during instruction. Such practices can help to reduce the impact of shifting preferences and satiation but difficulties may persist when the child's range of preferred items is limited and/or shifts frequently and rapidly during instruction. To date, while researchers have investigated the most effective ways of conducting preference assessments (Blair et al., 1999; Dattilo, 1987; Dominguez, Ziviani, & Rodger, 2006; Gast, Jacobs, Logan, & Murray, 2000; Hughes, Pitkin, & Lorden, 1998; Logan et al., 2001; Lohrmann-O'Rourke, Browder, & Brown, 2000; Lohrmann-O'Rourke & Browder, 1998; Parsons, Reid, & Green, 1998; Reid, Everson, & Green, 1999; Wacker, Berg, Wiggins, Muldoon, & Cavanaugh, 1985), far less attention has been paid to how these preferred items can be used to maximise engagement during periods of instruction for children with autism.

One recent study by Endicott and Higbee (2007) involved the use of preference assessments to select high and low preferred items to teach four preschoolers with autism to mand for information about the location of those items. All the children learned to mand for information but interestingly, no differences in response rates to the high- and low-preference items were found. The hypothesis preferred by the authors to explain this result was that the procedure used for teaching manding took on reinforcing properties, although they also noted that in each case, responses were acquired by using highly preferred items prior to the presentation of low preference items. It therefore remains unclear from this study the extent to which

the use of preferred items was required to engage the child in the activity and enable response acquisition.

Conclusion

Arguments have been proposed that use of the more general term ‘engagement’ can be problematic and that studying behavioural, cognitive, and emotional components of engagement separately may be more meaningful (Fredricks, Blumenfeld, & Paris, 2004). From a behavioural perspective, the concept of child engagement requires us to consider setting events, antecedents, behaviour, and consequences not only as separate components but to consider the complex ways in which they interact (Carter & Driscoll, 2007). In addition, the engagement construct also incorporates cognitive and emotional components. As a result of the complex and multidimensional nature of the construct of engagement, there has been some debate as to whether the study of engagement can improve knowledge and understanding about factors that may facilitate participation in learning. That is, each component is linked to its own separate literature and there is concern that by combining them under a single umbrella, conceptual clarity will be compromised. The counter argument is that by studying engagement as a “meta” construct, akin to holistic approaches in the health sciences, novel contributions are made by understanding the interactive effects of the individual components (Fredricks et al., 2004).

For children with autism, there are a number of factors that make the study of engagement appealing and may lead to the development of more effective learning interventions. In the early years, intensity of intervention is acknowledged as an important ingredient to improve child outcomes (Dawson & Osterling, 1997). It is clear, however, that intensity, while essential, is not sufficient to achieve positive outcomes (Hume, Bellini, & Pratt, 2005; McGee et al., 1999). Much effort has been

expended in comparing different intervention approaches of similar intensity to determine whether one approach leads to superior outcomes over another for children with particular characteristics (Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Sallows & Graupner, 2005; Smith et al., 2000). A measure of the amount and level of engagement relative to hours of intervention may make an important contribution to an understanding of the effectiveness of these efforts by providing a measure of the quality of those intervention hours. There is some evidence to suggest that engagement can be an effective measure of program quality (McWilliam, Trivette, & Dunst, 1985; Raspa, McWilliam, & Ridley, 2001; Ridley, McWilliam, & Oates, 2000).

From an applied perspective, the study of engagement has the potential to assist educators and therapists to maximise learning outcomes by (a) recognising teachable moments, that is, times when a child is engaged, and maximising learning opportunities at those times; (b) increasing knowledge and awareness of factors that may enhance engagement in learning and thereby ways of manipulating those variables to increase engagement; and (c) recognising when a child is disengaged and therefore not learning, and focusing attention on how to engage or reengage that child.

The current review of engagement suggests that it is a multidimensional construct influenced by many variables that interact in complex ways to influence intervention outcomes for children with autism. Individual components of engagement have their separate literatures and investigations along these lines will continue to make important contributions to our understandings of engagement. There is also a place for the study of engagement as a metaconstruct as proposed by Fredricks et al. (2004).

Future studies of engagement would benefit from a greater clarity of definition and measurement. At present, there is no agreed conceptualisation or definition of engagement and studies investigating levels of engagement vary greatly in both the definition and measurement of the construct.

A systematic approach to the identification of variables both internal and external to the child and ways in which these variables may interact with each other to influence levels and types of engagement in children with autism is suggested. The review of existing research suggests that further investigations into the influence of adult responsiveness, use of child preferences, and group size on the engagement levels of children with autism are of particular importance.

Finally, research that extends beyond the measurement of engagement and the influence of various internal and external factors to investigate the relationship between levels and types of engagement and intervention outcomes is needed. These investigations have potential to contribute to a better understanding of what interventions work best for which children and ultimately to the development of more effective interventions for children with autism.

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Author Note: Preparation of this manuscript was supported in part by a grant from Griffith University with contribution from the Autism Early Intervention Outcomes Unit (AEIOU). Address correspondence to Deb Keen PhD, School of Education and Professional Studies, Mt Gravatt Campus, Griffith University Queensland 4111 Australia.