Science for All Project Report: Implications for Autism

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Brief

This report presents an analysis of 4 case study accounts to identify issues that may have particular relevance for young people on the autism spectrum in relation to the learning and teaching of science. From the case study reports it is not always clear whether those students taking part had a specific diagnosis of autism although all students appeared to be categorised as having special educational needs.

Terminology

Some schools used the term 'students' and others 'pupils'. 'Students' is used in this report to represent the young people involved in these projects.

Case Studies

The case study reports that were analysed were:

Birley Community College – Using Frames to Support Learning in Science

Ravenshall Special School Dewsbury – Growing Plants

King Ecgbert School – A Tool to Support Graph Drawing in Secondary School

The Forest School, Knaresborough – The Use of Cameras in Special Needs Science Education

Key Stage

All projects focused on teaching and learning in key stage 3.

Overview

The case study accounts evidence examples of inspirational teaching and learning that is constructed, for the most part, around a careful analysis of students' models of learning, current skill levels, motivations and provision of learning experiences that are intrinsically rewarding.

Issues

<u>Attention, Motivation and Independence</u>

Science was felt to be a subject that was of inherent interest to students on the autism spectrum. This is to be expected because of a typical profile associated with autism where students are more interested in fact than fiction. Even within science though some students on the autism spectrum can be reluctant to engage with a learning agenda that is set by someone else if it does not connect with his/her own particular interests. Some of these projects sought to address this by enabling students to exercise some control over their learning and to select the focus of study within the permitted perimeters of the task. One project (Forest School) observed carefully what captured the

interest of individual students and then utilised these in the learning of that student and also her peers. Birley Community College enabled students to explore pictures that particularly interested them. Where the topic itself might not have had a strong intrinsic interest then external motivators could also help maintain focused attention on the task: a student was motivated, for example, to record comments by using the staff laptop. Ravenshall sought to retain interest in the activity by using fast growing plants so that students saw rapid results.

Some students who have experienced high levels of adult support can become dependent upon prompting. One goal for Birley's project was to encourage independent and sustained learning. The Forest School used photographs to enable greater independence for students by using these to help parents/carers with recognising their son's/daughter's developing maturity and capabilities.

Learning Styles

All four case studies identified students as having a range of preferred modes of accessing learning that involved a number of the senses. These included visual (use of photographs) and touch (feeling earth, plants, pegs into holes). For people on the autism spectrum making choices can be challenging: King Ecgbert's school staff designed their materials so that the options for learners were limited and the tool itself guided decision making.

Multiple learning requirements

Students were identified as having a number of learning requirements. King Ecgbert School, for example, used coloured transparencies to support students with a visual impairment and Birley Community College employed different coloured paper to enable access for students with specific reading difficulties. Traditionally additional 'impairments' are often not addressed for students on the autism spectrum as the label of autism appears to impede recognition of other issues with learning.

Identity and Self-esteem

Fear of failure and appearing 'stupid' in front of peers are often reported by people on the autism spectrum as barriers to new learning. These projects utilised a number of approaches to avoid students 'losing face' and to maintain belief in themselves as learners. These included working to strengths, e.g bullet pointing rather than extensive writing (Birley), being able to wipe out errors (Birley), utilising familiar approaches from other areas of the curriculum (Birley), trying out an idea before committing it to paper (King Ecgbert) using tactile apparatus rather than traditional methods that might remind students of previous failures (King Ecgbert) and enabling different sensory modes of learning (Ravenshall, King Ecgbert). In its use of photographs the Forest School developed a broad range of strategies for protecting and developing self- esteem. Students' interests and experiences were valued through being captured and recorded as significant moments. Students were given recognition for learning discoveries and these were then shared as learning opportunities with peers (e.g the student holding a rainbow in her hands) and children's choices were responded to (enabled to replicate experiences captured within peers' photographs). Some of the photographs presented seemed to portray what might be termed an autistic view of the world as elements of an object or person were elevated above what it represents as a whole (e.g an eye through a prism or a magnifying glass). Photographs were also used to remind students of their abilities and records of

their own positive behaviour were utilised as models for behaving well. The school recorded too moments of learning between peers or personal exploration and in doing so demonstrated a valuing of pupil as well as teacher led learning.

This use of photographs supports also the development of an experiencing self (Jordan and Powell, 1990), by helping students to form an understanding of what it means to be them and to connect their current self with their past and future selves. Photographs were used here to help to make memories that could be repeatedly accessed through these visuals and placed in a timeline of events.

Visual learning

Students with autism are often said to be visual learners. Pictures and photographs were used significantly and effectively in these projects by Birley, Ravenshall, and the Forest School. They were used to stimulate interest, provide an impetus for communication, a record of achievement, a reminder of what had been learnt, to compare changes in materials and as illustrations of social situations to help with the understanding of social rules (The Forest – Social Stories).

Recording individual achievement and progress

The problem of how to capture students' progress and achievement if these are 'ephemeral' was raised by Ravenshall and The Forest School. Young people are rarely placed at the centre of assessment of their own learning. Often assessment is about students and not for them, it is designed to produce comparative data for those who inspect rather than inhabit schools. The Forests School's project demonstrates some inspirational assessment practice that is for young people. Students' achievements are recorded to create memories for those who might not otherwise remember and to revisit experiences when not distracted by the event itself to learn new things from them. Photographs were also used to record students' expressions that seem to capture within them the very moment of learning, and to inspire the students themselves and others to try new experiences

Labels can sometimes subsume individual student's potential, aspirations and achievement as the diagnosis presents all students as having a certain skill set. Students with autism, for example, are sometimes conceptualised as more practical than conceptual learners. King Ecgbert's school perhaps illustrates this by electing to teach all 'SEN and ASD pupils' on a 1:1 with a focus on the practical tasks involved in creating line graphs rather than on developing understanding of the concepts. Of course this decision might have been informed by knowledge and understanding of the individual learners but it serves the purpose here of illustrating the potential power of labels to limit students' opportunities for learning.

Value added

From these case study reports it is difficult to get a clear picture of whether the projects were thought by those who devised them to have achieved their aims. They certainly sound positive learning experiences but there is not enough information provided to evaluate the impact of these new ways of working on students' engagement and attainment. The reports, quite rightly,

communicate a sense of pride and achievement but more reflection on how these projects really impacted on learning would be useful. However, some new successes were recorded such as a pupil having more sustained interest in tasks than previously (Birley), students finishing work (Birley) and an increase in the number of student questions (Ravenshall).

Conclusion

It was a privilege to read these accounts of what seems such inspirational teaching of science. The photographs capture beautifully wonderful examples of engaged learning and are a great resource for enabling inclusive practice. A number of strategies, such as use of visual, structured learning and avoidance of failure techniques, are identified that would support a number of students on the autism spectrum. Knowledge of autism strategies and styles of learning should always only be a guide, however. It needs to be remembered that learning is always individual and teaching should be designed around each student's requirements rather than expectations associated with a label. It is especially encouraging to see students placed at the centre of learning in these case studies, able to direct and develop both their own experiences and to shape those of their peers. The Forest School in particular provided some examples of how records of achievement can and should be used to help students understand their own learning journey and we hope that these approaches are widely shared.

References

Jordan R. R. and Powell S. D. (1990) Improving Thinking in Autistic Children Using Computer Presented Activities *Communication*, 24, 1: 23-25