Cubetto playset: Education case studies

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Institution
Cyril Jackson School, London, UK

Age group
7 to 9 ASD Inclusion Class

Group size
6 to 8 children

Session leader
John Galloway

Date
Spring 2014

Setting
School setting

Activity
30 minute introductory workshop.

“The Cubetto Playset is a brilliant concept - a highly accessible introduction to programming that looks like a retro toy. Easy to get started yet offering challenge and complexity at many levels. A welcome addition to the toolbox for inclusive classrooms.”

John Galloway - ICT and Inclusion Educational Specialist

Cyril Jackson is an East London based Primary school with a fantastic inclusion and SEN programme that uniquely caters to children’s individual needs.

Cubetto was used in an inclusion classroom to help children on various points on the autism spectrum deal with sequencing. While some students could understand the underlying concept of programming, for most it was about focus on practicing consecutive instructions and actions.

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What happened

How did Cyril Jackson incorporate the Cubetto Playset into their program? Cubetto was used on issues of executive functioning for children with ASD. It involves such undertakings as following directions, telling stories, making a schedule, and establishing priorities. We used Cubetto to help students overcome this challenge.

What particular aspect of Cubetto worked well for this activity?

Having the actual instructions as tangible elements, rather than just the robot, really worked well. It gave instructions a physical dimension and not just the outcome. Having Cubetto generate a specific sound for each specific instruction also really helped with focus. That was fantastic.

And what about the challenges involved?

The challenge is always attention and focus. Children are often able to understand these ideas, but find it difficult to concentrate or express these notions, which they were able to do with Cubetto.

Would you recommend the Cubetto Playset to another school or teacher?

Yes, I would, I think it would be an excellent addition to the toolkit for any inclusion classroom.

“One of the greatest challenges we face during inclusion activities is focus. The staff was surprised at how effective Cubetto was at achieving this goal by combining sight, sounds and touch into a single sequencing toy.”

John Galloway - ICT and inclusion Educational Specialist

How did students respond?

They were in awe. I had never seen them all focus so intently and pay such close attention to what was happening. This alone is an incredible response.

How did staff members respond?

The staff were equally impressed and surprised at the way children focused. And it goes without saying that how easy the setup was, meant this could be a resource that can be quickly implemented in many classrooms.
Educational Case Study
Cyril Jackson School

Outcome
“Children may not have been able to articulate a clear understanding of sequencing, but they were able to demonstrate it by purposefully controlling Cubetto. This was quite an achievement in itself.

They were able to engage for the entire duration of the session, which is a spectacular outcome considering the target audience.”

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Sunflower Montessori School is a Montessori School in Twickenham, London, which encourages the development of the whole child by providing a comprehensive Montessori education.

To see the children totally absorbed, and intrinsically motivated whilst manipulating Cubetto was a very special Montessori moment indeed!

Melissa Stockdale - Montessori school owner & director

Sunflower introduced Cubetto to small groups of 4 year old students. During the workshop, children were tasked with programming Cubetto to touch and avoid placed objects, with the aim of developing spacial awareness. Children helped one another to program Cubetto to carry out specific tasks that had been self chosen. They were also encouraged to predict the outcome before pressing the button for each child's choice of program.
What happened
How did Sunflower Montessori School incorporate the Cubetto Playset into their program?
Following the first lesson plan provided by Primo, we had a group discussion on the concept of programming. The children then manipulated objects like talking puppets, egg timers, torches and wind-up toys before being introduced to Cubetto. Working on the floor in the classroom, they took it in turns to program Cubetto and navigate him around toys that they placed in various positions on the workspace.

What particular aspect of Cubetto worked well for this activity?
The children were all able to operate Cubetto successfully. Working with Cubetto encouraged positive cooperative play and the children began to problem solve through discussion about spatial awareness. They also planned different sequences together and experimented with Cubetto.

And what about the challenges involved?
The children waited in turn to operate Cubetto and this was often for long periods. If another Cubetto could have been used at the same time this would have been beneficial. Some children did not place the tiles at the start and other children had to intervene to show them where to place the tiles.

“One four-year old child was able to complete several very complicated procedures, and after working with Cubetto for nearly an hour excitedly exclaimed: ‘Wow, this is fun!’”
Melissa Stockdale - Montessori school owner & director

How did students respond?
The children were fully absorbed in the task and concentrated happily for 40 minutes. They supported each other with positive comments and showed an interest whilst others were playing. They all understood how to program Cubetto.

How did staff members respond?
The adults were surprised with;
1. How Cubetto encouraged cooperative play and constructive discussions between the children.
3. How long the children concentrated on the task.
4. How little support was required from the adults.
5. How keen the children were to repeat the activity.
Educational Case Study
Sunflower Montessori School

Outcome
“All children were successful in programming Cubetto to go from one object to another, and were able to explain what programming was at the end of the session.

They enjoyed the session and talked about what they had done afterwards.”
Institution
Northwestern University, Chicago, USA

Size of institution
Total summer registration in Leapfrog is approximately 2500, and around 250 children used the Cubetto playset

Age group
6-8

Group size
4-16

Session leader
Ann Gadzikowski

Date
June-July 2015

Setting
Summer camp classes

Activity
Summer course

“We offered this course 5 times over 5 weeks with 5 different instructors and 5 different groups of children and each time the course was exciting and innovative in new and unique ways.”
Ann Gadzikowski - Early Childhood Coordinator, Northwestern University, CTD Program

Activity
The Center for Talent Development at Northwestern University exists to serve the gifted community. As a non-profit center within the School of Education and Social Policy, CTD ensures gifted pupils receive the education, encouragement and support they need to grow into confident and accomplished lifelong learners.

Northwestern used the Cubetto playset as the centerpiece of their Summer Leapfrog Program, which provides fast-paced summer classes for children who have a keen and early interest in learning. Cubetto was introduced as an example of ‘tangible programming’, a device that pupils can move, manipulate and hold to create computer codes.
What happened
How did Northwestern incorporate the Cubetto Playset into their program?
We named the course “Primo Pathways” because the playset was our primary teaching tool. Each day pupils rotated through learning centers and one or more of those learning centers utilized a Cubetto playset.

During the course, pupils used Cubetto to explore the concepts of ‘tangible programming’ and ‘elegant code’. They created increasingly complex and elegant codes to program Cubetto to perform specific tasks and actions. The children also learnt about the design, mechanics and programming of the playset. By the end of the program, they were able to define and use computer programming terms and concepts such as code, symbol, sequence and function.

What particular aspect of Cubetto worked well for the course?
The Primo playsets worked well as the core tool for the courses. Instructors successfully used Mr Cubetto and the interface board to demonstrate and teach the core terms and concepts of computer programming.

We were also able to introduce the concept of an “elegant” code. The design of the playset is simple and open-ended enough to provide a starting point for pupils’ own creativity and invention. They found all kinds of ways to represent their own codes, and in addition to the interface board they also used beads on a string or created their own symbols on paper.
What skills did Cubetto help to develop?
Cubetto encouraged the development both soft skills, such as spacial awareness and forward planning, and hard skills, like programming terminology and functions. The course topic was explicitly robotics and coding, but there was a lot of mapping, geometry and spacial reasoning skills that were intentionally included in the lessons.

How did pupils respond?
The children were happy playing with Cubetto, both with teacher facilitation and on their own, once they became familiar with how it worked. All of them were successful in using the playsets. The pupils also enjoyed dressing up Cubetto in different costumes, and he has very much become one of our classroom characters.

How did staff members respond?
Very positively. For most of the instructors, the first time they actually touched and used the kit was on the first day of class, and they all found it very accessible.

“The design of the playset is simple and open-ended enough to provide a starting point for pupils’ own creativity and invention.”
Ann Gadzikowski - Early Childhood Coordinator, Northwestern University, CTD Program
Education Case Study
Northwestern University

Outcome

“We were very happy with the results. The playsets worked well and didn’t break, in spite of heavy use each day. The instructors also remarked upon the success of the course.”
Institution
Orchard Primary School, London, UK

Age group
5-6 (Key Stage 1)

Group size
6-8 children

Session leader
Ruth Woodward

Date
Spring 2014

Setting
School setting

Activity
30 minute introductory workshop

“Programming is about understanding that an unambiguous sequence of instructions results in a specific outcome. Being able to teach this without the usual barrier of language, and moreover, a relevant toy that is tactile, and worked without a screen, was just great.”
Louise King - Principal, Peacock Montessori Nursery

Activity
Orchard Primary is an outstanding state school in East London, which has invested in several programs to make coding an official part of their ICT curriculum.

Cubetto presented Orchard with a perfect opportunity to introduce basic programming concepts to their youngest Key Stage 1 students. The workshop involved a 30 minute introductory session, where they built their first algorithms, and practiced creating a queue of instructions with clear and unambiguous commands, as well as understanding how important the order of instructions actually is.
Education Case Study
Orchard Primary School

What happened
How did Orchard incorporate the Cubetto Playset into their program?
Time is a luxury no educator or school really has. Finding an “immediate” resource for teachers that was also really effective and fun for the students is difficult. Cubetto’s immediacy is an easy win in that respect. Getting started was fast, and children instantly enjoyed playing, even if the session was short.

What particular aspect of Cubetto worked well for this activity?
First of all it was just plain fun. The little robot was evidently loved by all students. What also really worked was the tangible aspect of it all. Because there was no screen to look at on this particular activity, the physical involvement of children really helped engagement and attention.

And what about the challenges involved?
As mentioned above, the first challenge was “getting it” immediately for the educator, which was really no problem because the set up is minimal, and Cubetto’s tangible interface is intuitive even for an absolute novice.

Would you recommend the Cubetto Playset to another school or teacher? Absolutely. Ultimately it’s fun, it’s quick to set up, and the Interface Board element really opens up a lot of teaching opportunities that complement other resources.

“The experience was even more physical than really expected, and pleasantly so. Play quickly moved from just making programs with the blocks, to children dancing and jumping and moving around with the Robot, which you don’t get with onscreen tools.”
Ruth Woodward - ICT Primary School teacher

How did students respond?
Children were in immediate awe of Cubetto, formed in instant bond with the small character, which made the learning of sequencing meaningful for them, and quite effective. They were however, upset at Cubetto not being able to make birthday cake...

How did staff members respond?
The staff were relieved at how easy set up was, and ultimately pleased at how straightforward and focused play with children was.
Education Case Study
Orchard Primary School

Outcome
“Children clearly understood the sequence in which directions were given to Cubetto mattered. Telling him to go left, then forward was different than telling him to go forward and left.

They collaborated to create the right program as opposed to working in isolation, corrected each other’s mistakes.

They understood the definition of an algorithm in very simple terms, and could relate it to other examples outside the Cubetto Playset.”
Institution
Camp Tech Terra, North Carolina, USA

Age group
5-10

Group size
4-6

Session leader
Susan Wells

Date
Summer 2015

Setting
STEM summer camp

Activity
Introductory workshop

“I need him. This is better than my iPad. I’m going to buy him as soon as I can!”

Tristan, 9 years old

Activity
Camp Tech Terra takes technology and nature, and brings them together to help children better understand the world around them and the gadgets in their hands.

Cubetto was used at Camp Tech Terra to introduce the concepts of coding and robotics to classes of 27-30 children. Workshops consisted of demonstrations and discussions in small groups, before the pupils had their turn to plan and code with Cubetto.
What happened
How did Camp Tech Terra incorporate the Cubetto Playset into their program?
We used Cubetto as an introduction to coding for pupils to physically experience directionality and sequencing. Following a short introductory session, children were encouraged to discover Cubetto for themselves. Once the pupils had grasped the basic concept, Cubetto was used for more diverse subject matter, such as story-telling and mathematics.

What particular aspect of Cubetto worked well for this activity?
All the steps taken for introduction and interaction were successful. Cubetto proved a great starting point for teaching young children code, before progressing to more advanced tools.

How did staff members respond?
The staff were immediately able to see the advantages of physical interaction, rather than using a screen.

How did pupils respond?
Pupils were excited by Cubetto and enjoyed learning with him, and after 15 minute introduction lessons, children remained engaged with Cubetto for up to 90 minutes. None of the children struggled with Cubetto, regardless of age.

“I think Cubetto is the perfect first step in a child’s coding education. Once pupils have mastered the basic skills with Cubetto, they have a great platform from which to advance.”
Susan Wells - Founder, Camp Tech Terra
Outcome
Pupils were extremely excited at the “cuteness” of Cubetto, and eagerly awaited their turn to play with him. Surprisingly, success with Cubetto was not necessarily dependant on age, as younger groups proved as capable - and sometimes more capable - than older pupils.
Foxglove Montessori is an independent nursery school in the heart of Stowmarket in Suffolk. Cubetto was introduced to 48 children, with the aim of exploring the concept of programming.

Foxglove chose to set three main activities for their pupils:

1. Pupils moved Cubetto to reach a certain point, marked with a toy or piece of equipment chosen by the child.
2. The chosen toy or piece of equipment was then moved to the centre of a place mat and, following instructions, pupils positioned Cubetto behind, in front or beside the item, encouraging positional language.
3. Finally, the children were left to explore Cubetto individually and in pairs.

“Cubetto proved to be very versatile with endless learning possibilities.”

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What happened
How did Foxglove incorporate the Cubetto Playset into their lesson?
Cubetto was incorporated during the children’s work cycle by first introducing the idea of programming. After a group discussion, I introduced Cubetto and demonstrated its use. We then put this into action with the activities outlined above.

Overall, what worked well and what were the successes?
Working in small groups of 4 worked very well with this age group as it helped them to learn from each other. Those observing waited patiently, and once it was their turn, they had learnt from the difficulties their peers had experienced earlier. Those who had not observed other children had more difficulty but remained to watch their peers before taking another turn.

The simplicity of the programming board worked well with all, regardless of age and ability.

What skills did Cubetto help to develop?
Cubetto helped pupils to grasp new concepts and vocabulary, such as algorithms, basic robotics, and functions. At the same time, activities with Cubetto exercised soft skills, as it encouraged team work, spatial awareness, and thinking ahead. I also worked with some children on estimating distances, which extended the maths beyond counting and matching. We created stories of where Cubetto was travelling to, where he lives, and what he eats, which helped to promote communication and language skills.

“A boy aged 4 years with limited speech and possible autism engaged with Cubetto straight away. He was very focused on where he wanted Cubetto to travel and did not require any adult support. He celebrated his success with cheers and clapping, and immediately repeated the same activity three times.”
Louise King - Principal, Foxglove Montessori Nursery
How did pupils respond?
The children really enjoyed learning with Cubetto. Those who had already used Cubetto asked if they could use it again every day. When children were observing, they remained enthusiastic and helped by giving ‘advice’! Younger pupils, who initially demonstrated a bit of frustration when using Cubetto, took the opportunity to welcome the ideas of others.

Outcome
“Overall, Cubetto promoted personal, social and emotional development as it encouraged them to work together, take turns, and show respect. I am confident that it would be used frequently if it was on the classroom shelf.”