

# **An Evaluation of the use of iPads as Augmentative and Alternative Communication Devices (AAC)**

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## **Nether Hall School Project**

June 2014



Helen Robinson, ICT Coordinator, Nether Hall School

Heather Woods, Communication Support Coordinator, Nether Hall School

Karen Cameron MSc, Research Officer, De Montfort University

Dr Sarah Younie, Project Director, De Montfort University

We would like to acknowledge the support given to this research project from Leicester City Council and the DigiLit Leicester Project, which was funded through the Building Schools for the Future Programme's ICT Innovation Funding.

We would also like to thank the Digital Literacy Research Associate Lucy Atkins for her contribution and all the staff and pupils at Nether Hall School.

Finally, we would like to acknowledge the staff at Sensory Software International Ltd. for their support and training during this project. [www.sensorysoftware.com](http://www.sensorysoftware.com), [info@sensorysoftware.com](mailto:info@sensorysoftware.com), +44 (0)1684 578868



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## **Executive Summary**

This project investigated the use of iPads as a replacement for traditional Augmentative and Alternative Communication (AAC) devices. The project was undertaken by Nether Hall School, a foundation special school in Leicester for pupils with severe, profound and multiple learning difficulties.

The project came about through Leicester City Council's Building Schools for the Future Programme ICT Innovation Funding, which offers funding to support school projects that are aligned to develop digital literacy in schools through open competition.

### **Project Aim**

To investigate the use of iPads to replace conventional communication aids for pupils with limited speech (less than 50 words) to enhance their opportunities to communicate within school and the wider community. The project targeted pupils making limited progress with respect to their ICT, speech and language targets.

### **Key Outcomes**

The school has highlighted the following key outcomes:

- Where a pupil has been successful in using the iPad as a communication aid, their challenging behaviours have lessened.
- Pupils have been able to demonstrate a level of skill and understanding that they had previously struggled to communicate.
- Pupils have been able to learn and then to demonstrate that they are beyond the crucial benchmark of 'cause and effect'.
- Where previously, pupils might have been distracted, they were now focussed and motivated in class.
- Pupils were able to demonstrate knowledge and understanding.
- The pupils were able to build deeper relationships with staff and other pupils.

This supports the pupils at Nether Hall school in their human right to communication, education and participation as a member of the community.

### **Conclusion**

The project concludes that a tablet device together with appropriate software, such as the iPad and Grid player app, can be an effective and affordable communication tool for pupils with communication challenges.

### **Recommendations**

It is recommended that tablet devices paired with communication software, such as the iPads and The Grid 2, be provided to pupils with communication difficulties to enhance their ability to participate fully in their learning, in relationships at school and at home, also in the wider community.

## Introduction

Nether Hall School launched the iPad pilot project in September 2013, with the aim to use an iPad as a communication device for those pupils with limited speech (less than 50 words) and therefore to enhance pupils' opportunities to communicate within the school and the wider community and to facilitate independent learning. The school are commitment to being a total communication environment. Communication was recognised as crucial to the pupils' development and every effort was made by all staff to communicate with each pupil according to the pupil's needs.

The school's ethos is clearly linked to the United Nations Convention on the Rights of Persons with Disabilities, which acknowledges these persons' right to education so that disabled people may develop their full potential, their sense of dignity and self worth and participate fully in a free society. If a person is unable to communicate, it is difficult to see how that can be achieved. Bercow identified communication as being crucial and stated that it "...underpins a child's social, emotional and educational development..." (2008, p.7).

## Context and background to the project

Nether Hall School wanted to investigate the use of iPads as a replacement for traditional AAC devices, using 'The Grid2' alternative communication, computer access and environment control software. The project came about through Leicester City Council's Building Schools for the Future Programme ICT Innovation Funding, which offers funding to support school projects that are aligned to develop digital literacy in schools through open competition. The Council's funding is available for the use of technology to support learning, teaching and community development.

The BSF ICT Innovation fund is primarily to support staff development, in line with the six strands identified as priority areas by the [DigiLit Leicester Project](#). Namely using digital technology to facilitate: *Finding, Evaluating and Organising; Creating and Sharing; Assessment and Feedback; Communication, Collaboration and Participation; E-Safety and Online Identity; and Technology supported Professional Development*. (Fraser et al, 2013)

In keeping with the ethos of the project, awards were made to projects where outputs and processes were openly shared. This is to ensure that projects benefitted members of the immediate school community, and also other schools across the city, regionally and nationally.

## Nether Hall School

Nether Hall School is a foundation special school for pupils with severe, profound and multiple learning difficulties. There are 87 pupils on roll, ranging from 4 to 19 years. Along with several other special schools in Leicester, Nether Hall School is part of The Well Trust. The school is funded by, and accountable to, the local authority.

All the pupils at Nether Hall school have, or are being assessed for, statements of special educational needs. They all have either profound and multiple learning difficulties or severe learning difficulties. About a quarter of the pupils also have autistic spectrum disorders and many have physical and or sensory impairment with approximately a quarter being visually impaired.

The school use the '[Signalong](#)' sign-supporting system based on British Sign Language, designed to help children and adults with communication difficulties. Most pupils are at early stages of spoken

language and over half speak English as an additional language. Over three quarters of the pupils are from a wide range of minority ethnic groups; almost half are of Indian heritage.

At just over a third, the proportion of pupils who are known to be eligible for pupil premium funding is slightly above the national average. This is additional funding for specific groups of pupils, in this case, those who are looked after by the local authority or who are known to be eligible for free school meals.

### **School technology**

The school has a network that extends to all areas of the school. All computers are connected to the school's network and the Internet. There are thirty five curriculum based computers, with at least two multimedia computers in each classroom and at least two in each area of the school. Touch screens and variable height furniture are available where required. Wall mounted smartboards and ceiling mounted projectors are installed in every teaching space. There is also a suite of 7 computers, 2 of which have touch screens as well as furniture adapted for the pupil's needs.

Each teacher is provided with a laptop (19 in total) and the school own 20 iPads, 19 of which are used as communication devices for the purposes of this project. The other one is used by the ICT Coordinator and the IT technician.

All the computers that are available for pupils to use, have switch capability as an alternative form of access. Selected pupils are assessed for individual switch and positioning needs as required. Eye gaze, roller balls, big keys, and adapted mice are also available within school.

The available AAC devices that the school uses are the [Zingui](#), [MyTobii](#) (eye gaze) and [Dynavox](#). These are often expensive - in the region of £4,500 to £14,000 and are reported by teachers to be cumbersome. Some of these devices may also be used at home if the family pays insurance costs. However, it never belongs to them and once the pupil is 19 years old, they are deemed no longer in education and the device is returned to the Local Authority.

The school's aim was to supplement these traditional AAC devices with tablets, as a technical tool to aid communication. The iPad was selected as it was easily portable; feeling less conspicuous when used around school than when using the low tech alternatives such as the [Big Mack](#), or [Super Talker](#). In particular, the school wanted to trial a device which pupils may eventually have access to at home and to be able to use it in order to communicate with their family and in the wider community.

### **Software to aid communication: 'The Grid 2'**

The Grid 2 software uses pictures and symbols to facilitate a conversation that can be understood by any member of the public. The system displays grids of symbols which are accessed by touch. The word associated with the symbol touched will be spoken by the device. There is a choice of two voices - male or female. The software is also adaptable, so grids can be personalised to each individual pupil according to their requirements.

The Grid 2 programme costs around £360 for a single user license, and a free iPad app ([Grid Player](#)) can be used to display standard or pre-made bespoke grids. There is currently no app for android devices.

### **Initial set up costs:**

Item	Units	Unit Cost	Total
iPad	10	£399	£3990
The Grid 2	School license	£360	£360
Griffin iPad case	10	£35	£350
Specialist Software Consultation	1/2 day		£300
		<b>Total Costs</b>	£5000

### Pilot iPad project

The project ran from September 2013 to June 2014. Twenty pupils have been involved, together with the ICT Coordinator, the Communications Support Coordinator (CSC) and three class teachers. Learning Support Assistants have also been involved in supporting the pupils with their iPad in class and in collecting pictures and ideas for the CSC to update the pupils' bespoke grids. The project targeted pupils making limited progress over time in ICT, speech and language. The project also focused on pupils with limited understanding of 'cause and effect' to establish if mobile technologies can enhance learning of this early developmental milestone.

The project aimed to investigate the use of iPads to replace conventional communication aids for pupils with limited speech (less than 50 words) to enhance their opportunities to communicate within the school setting and the wider community.

The majority of pupils at Nether Hall School have difficulties with speech and language and many require AAC methods to help them to communicate. On the whole the conventional devices are difficult to carry around or limited in nature. For example, the 'Super Talker' has a grid of only 8 words available and costs £200. Many of the devices cost between £4,500 and £14,000, which restricts the number of pupils who can be provided for with a limited budget.

If successful, the project would also increase the number of pupils who could be provided with high-tech AAC equipment and thus be provided with an open ended communication system.

### Pupils' code of practice with iPads

The school identified the need to establish a set of rules regarding the use of the iPads. It was decided that these rules should be put in place from the outset, across the whole school.

The iPads could not be used as anything other than a communication device; settings were adjusted to prevent this. Therefore, pupils could not access games they may have been accustomed to on the iPad. It was crucial that the pupils used a point and touch method to access the technology, as it was this control that made communication possible. If they could not overcome the habit of swiping across the screen, as they may previously be accustomed to with some iPad features; they were unable to use the Grid Player app.

In addition to these rules, which established a school 'Code of Conduct' with respect to iPad use, the school also discussed how to manage and protect the hardware. As the iPad has a glass screen and might be dropped, the school explored a range of protective cases. The school chose the Griffin iPad cases which were black, soft rubber and found to be highly effective. The soft rubber also made the iPad easier to grip. It also disguised the iPad to some extent. The iPad with the cover looked, felt and smelled differently to an iPad which may be used at home for recreational purposes. It was felt that



this distinction was important so that school iPads were seen as communication devices, different from the iPads at home.

The school iPads were to be used one to one with the CSC until she decided that the pupil was sufficiently capable of using the iPad appropriately in class. The iPads were not to be used in class until it was established that the pupil could use them in that situation for communication.

The CSC and IT coordinator received full training from the software developers. It was essential that these teachers were able to program the software to meet individual pupils' needs. It was as a result of this training, that the teachers were able to use the program to its full extent, as the teachers intended for this project.

Originally it was intended that these trained staff would cascade the training to the class teachers. However, it soon became evident that this would not work as the time taken to continually update the programme for each pupil would add too great a workload on the teachers. It had been thought that only occasional updates would be necessary and therefore would be difficult for each teacher to maintain those skills. This would have added a retraining burden to the workload. As the CSC was working one to one with the pupils and could assess when and how to develop the communication grids, it was decided that it was more time efficient for her to make those assessments and reprogram the devices accordingly.

Initially, ten pupils were selected across the ability spectrum of the school. Once it was seen how well the project was working, a further ten iPads were purchased and a further ten pupils joined the project. Three pupils left the school and three more pupils were selected.

### AACs in the literature

The United Nations Convention on the Rights of Persons with Disabilities (2008) Article 24 Education demands that:

States Parties recognize the right of persons with disabilities to education. With a view to realizing this right without discrimination and on the basis of equal opportunity, States Parties shall ensure an inclusive education system at all levels and lifelong learning directed to:

- a. The full development of human potential and sense of dignity and self-worth, and the strengthening of respect for human rights, fundamental freedoms and human diversity;
- b. The development by persons with disabilities of their personality, talents and creativity, as well as their mental and physical abilities, to their fullest potential;
- c. Enabling persons with disabilities to participate effectively in a free society.

(United Nations, 2006)

All pupils therefore should be given the opportunity to realise their potential, to have a sense of dignity and self worth and to participate effectively in a free society.

In the foreword to The Bercow Report (2008), John Bercow was very clear on the matter of communication. He identified communication as being crucial and stated that it '...underpins a

child's social, emotional and educational development ... To be able to communicate is a precious commodity. To be unable to do so can be a profoundly damaging disability. The challenge in a civilised society is to support those for whom communication is more difficult...' (Bercow 2008, p.7)

In addition Jean Gross, Communications Champion, recommended that local government 'develop effective local AAC services involving SLTs, occupational therapists, teachers and technicians' Gross 2011, p.11). She also recommended that schools 'screen children with behaviour difficulties in order to identify any underlying SLCN [Speech Language and Communication Needs] they may have' (Gross 2011, p.12). In this last clause; Gross recognises that difficulties in communication can lead to challenging behaviours.

These recommendations have been met, in part, by moving access to AAC devices to the NHS. However, the NHS Interim report, section 3.4, for adoption from 1st October 2014, states that:

An individual who would access a specialist AAC service would have both of the following:

- a severe/complex communication difficulty associated with a range of physical, cognitive, learning, or sensory deficits
- a clear discrepancy between their level of understanding and ability to speak. In addition, an individual must
- be able to understand the purpose of a communication aid;
- **have developed beyond cause and effect understanding;** and may:
- have experience of using low tech AAC which is insufficient to enable them to realise their communicative potential.

(NHS England, 2014)

This new set of requirements would mean that a large number of the children at Nether Hall School, as well as across the city, would no longer be deemed eligible for access to an AAC device. The school's project can therefore also be seen as an attempt to prove that young people who have not developed beyond cause and effect understanding are still able to benefit from an AAC device.

The use of the iPad, a potentially more affordable solution than current AAC devices, has been key to the school's project. Other research into the use of iPads in schools has shown that the device can offer many benefits, beyond financial. For example, a study into the use of iPads in Scottish Primary schools found that the devices offered many benefits for learning, including greater motivation, engagement, parental involvement and understanding of complex ideas (Burden *et al.* 2012).

The study concluded that the use of iPads in school was beneficial due to the ease of use which engages and motivates pupils and staff alike. Parents also became more engaged with the school and their child's learning when they were able to see the iPad being used effectively.

## Methodology

The ICT Coordinator and the Communication Support Coordinator collaborated with the university researchers during the project as co-researchers.

### Sample

Out of 87 pupils on role, 20 pupils have taken part in this project. Initially, ten pupils were identified. Out of those ten, three pupils left and three more pupils were then selected to take their place. Shortly into the project it became apparent that it would be possible to work with a further ten pupils to introduce the iPad as a communication device on a one to one basis. The school have since purchased ten more iPads for these additional pupils. The school also has a waiting list for more pupils where it was felt the pupils could benefit from the use of the iPad as a communication tool.

Pupils were selected where experience suggested that a pupil did have the cognitive ability to communicate, but was prevented by a variety of reasons including:

- Inability to articulate
- Inability to sign
- Inability to enunciate
- Inability to vocalise

Challenging behaviours suggesting a need to channel the pupils' frustration through a communication strategy also indicated where the iPad might be successful. Challenging behaviour can be defined as:

“Behaviour(s) of such intensity, frequency or duration that the physical safety of the person or others is likely to be put in jeopardy, or behaviour which is likely to limit the use of, or result in the person being denied access to ordinary community facilities.”

(Emerson 1995 cited in Emerson 2001)

In other words, behaviour is challenging if it causes harm to the person or others, or if it stops them fulfilling some aspect of their lives. It is the impact of these behaviours that makes them challenging, not any judgement about their appropriateness. There are many different types of behaviours that can be called challenging:

- Self-injurious behaviour includes head-banging, scratching, pulling, eye poking, picking, grinding teeth, eating things that aren't food.
- Aggressive behaviour toward others includes biting and scratching, hitting, pinching, grabbing, hair pulling, throwing objects, verbal abuse, screaming, spitting.
- Stereotyped behaviour including repetitive movements, rocking, repetitive speech and repetitive manipulation of objects.
- Non-person directed behaviour includes damage to property, hyperactivity, stealing, inappropriate sexualised behaviour, destruction of clothing, incontinence, lack of awareness of danger, withdrawal.

(Scope, 2014)

Challenging behaviours, then, can be a range of behaviours from aggressive 'acting out' to passive 'withdrawal' and refusal to engage with people or activities.

Currently 17 pupils are using the iPad as a communication device. For the remaining 3, the iPad proved not to be an effective tool for communication.

### Data collection

The research methods used were; teacher interviews and observations.

**Teacher interviews:** Six semi structured interviews were conducted with three teachers, the IT Coordinator, the Communications Support Coordinator and the Head Teacher. The interview questions were structured to examine and evaluate the (CSC) impact of the iPad project on the pupils, staff and school. Please see Appendix F for a copy of the interview questions.

**Participant observations by the researcher:** The researcher visited the school on five occasions and observed the pupils working one to one with the CSC. The observation was immediately followed by a semi structured interview with the CSC to discuss and evaluate each observation.

**Pupil case studies:** Five pupils were selected from the 20 pupils in the project, and reported on as a case study. These pupils were selected to cover the range of ability, from pupils with the very simplest starting grids to those with the most complex grids. One of the case studies reports on one of the three pupils in the study for whom the iPad did not work as a communication device.

The data from each individual case study was collected through participant observations and the semi structured interviews with the CSC that followed the observation. The information was collated as five individual pupil case studies. These case studies can be found at the end of this report, in Appendices A – E.

### Procedure

The Communication Support Coordinator's (CSC) role was central to the project. The CSC used her knowledge and understanding to make the bespoke grids. Her knowledge and skill in working with the pupils engendered a strong sense of trust between her and those pupils. The one to one work with the grids then built on this trust and gave the pupils a voice which they could then use to communicate and access learning.

The first stage was to introduce the device as a tool, with a grid that was appropriate to each individual pupil. Serious consideration, based on assessment and experience, was given to deciding whether to use True Object Based Icons (TOBI<sup>1</sup>), photographs or symbols for each student. Also how simple or complex the starting grid should be. The decision about what the first items would be was personalised, based on knowledge of each pupil. For one pupil, just one TOBI of a much loved wind up music box was selected. For another, small photos of his class and the teaching staff were the starting point. Below are some examples of the starting grids, more detailed maps of these grid systems can be found the learner case studies in Appendices A-E.

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<sup>1</sup> A T.O.B.I. can be a line drawing, scanned photograph, etc., which is cut out in the actual **shape** or outline of the item it represents.



The iPad showing the Griffin cover and the initial symbol screen of Grid Player.



The iPad showing the Griffin cover and specific Grid Player symbols.



The iPad showing the Griffin cover and Grid Player with photo icons added.

One to one teaching sessions with the CSC were given to demonstrate to the pupils that if they touched the photograph or symbol, they would receive the item they had requested, immediately. If they did not touch the icon, or were aggressive, there was no reaction from CSC. If a pupil threw an item they didn't want during the activity, such as a toy, pencil or the iPad, the CSC simply reiterated to them that the item must be picked up and given back appropriately. When they did this, there was much praise while the CSC received the desired item.

In this way, a relationship of trust was built around the use of the device. The pupil knew the rules and that a choice would receive an appropriate response. The pupil had to accept the item or complete the activity they had selected before they were given another choice. For some pupils, simply recognising that they could interact and take control of the proceedings was sufficient to motivate them to use the device for communication.

Once the iPad was established as a communication device, the grid was developed. This was bespoke to each individual pupil. On the simplest level, the photo began true to size and gradually became smaller and moved to a different part of the screen after selection. The pupil had to be more accurate to request the item or activity.



True Object Based  
Icon (TOBI) - a photo  
of the actual object,  
life sized



Photo reduced in size



Second photo added,  
of a disliked object

Next, an item that was known to be disliked was added. This was to test whether the pupil was indeed selecting an item, or simply pointing and touching the screen randomly. If this item was selected, the pupil had to hold it and interact with it. For example, the pupil had to shake the tambourine for a short time before giving it back. The next step was to make the icon move after it had been touched, again to check that this was not random. The pupil had to look at the icon and touch accurately to make their choice. Rules were therefore established around the use of the device.

On a more complex level, photos were the starting point. In some cases these were photos of the class and staff. The pupils would use the device to participate in a registration activity. This led quickly to adding symbols for lessons. Alternatively, the standard grid issued by The Grid 2 programme was used and simplified to the level that worked with the individual pupil.

Once the iPad was being used in class, the teacher would become involved. Once that happened, the teachers involved soon became increasingly enthusiastic, and suggested photos or symbols to add so that participation in other lessons was facilitated. The class staff would collect photos and other information as required. This was then given to the CSC and she would adapt the grid by the end of that day. This pace of change was crucial to the impetus of the project.

## Findings

This section outlines the emerging findings from the pilot project. The evaluation of the project found a number of significant findings concerning the impact on pupil engagement and motivation, pupil learning, pupil communication and pupil behaviour.

### Pupils

The teaching staff learned quickly for whom the iPad with The Grid 2 software would work as a successful communication device. Notably, it was with those pupils who showed an interest in the iPad, and the pictures or icons on the grid, immediately. These pupils had had no previous iPad contact, and had not learned 'swiping' behaviours with reference to the iPad screen. If there was no immediate interest, reinforcement with a reward sometimes engaged the pupil.

There were three pupils for whom the device was unsuccessful as a communication device. These pupils showed little interest in the device or the pictures on the device. They had had previous experience of the iPad as a games device and had the habit of swiping and would not point and touch the screen. The pupils were not motivated by the device and rewards proved ineffective.

Seventeen pupils continued to use the iPad as a communications device with great success. It has been transformational for these pupils. Their communication skills increased and are continuing to build, showing evidence of becoming more complex. These pupils were demonstrating a level of learning that staff had previously been unaware they were capable of.

At the beginning of the project, the five case study focus pupils were each exhibiting a lack of engagement and motivation which was demonstrated by challenging behaviours - ranging from refusal to engage with others or activities to challenging outbursts both in and out of class. (See Tables 1, 2 and 3)

### Impact of the project on pupil behaviours

For all pupils for whom the iPad was successfully used as a communication device, instances of challenging behaviours have lessened. For example, where Pupil 'A' would have outbursts several times each day, partly as a result of his medical condition, the outbursts now occur less frequently (often only every other day). Pupil 'E' exhibited very challenging behaviours and would require two members of staff to sit alongside her, now one suffices. Where she did not like to be touched, and would scratch when upset, she will accept gentle contact and will also touch the Communication Support Coordinator (CSC)'s hand gently. This marks a radical change in pupil behaviour, which has come about as a direct result of the use of the iPad as a communication device.

**Table 1: Changes in pupil behaviours**

Pupil	Behaviours	Before	After
<b>A</b>	The pupil would have outbursts as a result of his medical condition.  He loves people but has a low tolerance.	These outbursts would occur several times each day.	The outbursts are now less frequent, perhaps every other day.
<b>B</b>	Visually impaired and would shout 'hiya' and inappropriate words at people, which he would	He would shout out continually to gain attention, especially	The pupil will now use his iPad to communicate wants and needs.

	repeat randomly to get their attention. He would also look to get at people to get the attention.	during quiet times.  He would mouth his fingers or objects when not shouting.	Reduced mouthing.
<b>C</b>	The pupil would play alone. He didn't socialise with others without in-depth relationships forming.	Lack of patience when misunderstood. Would not 'bother'.	Now more confident. Will persevere.
<b>D</b>	The pupil is on the Autistic Spectrum. He is self reliant. He has some speech - single word demands.	He would take what he wanted. He used Picture Exchange Communication System (PECS).	The pupil became frustrated and angry as he couldn't use the iPad in the manner he was used to. The iPad did not work as a communication device for this pupil. He continues to use PECS.
<b>E</b>	Physically challenging outbursts towards staff and pupils.  Throwing objects. Grabbing, squeezing and scratching.	During focused working time two members of staff were often required to contain the pupil's outbursts. One adult would sit either side. Some level of physical support would be given.  Those who worked closely with her had scratches to the face, hands and legs.  The pupil could or would not touch others gently.  The pupil would try to grab at passing members of staff. If this had no effect she would grab other pupils.	Now, the pupil will work with one member of staff sitting adjacent at her table.  Members of staff working with her only occasionally are scratched.  The pupil will now gently touch the staff members' hand and give eye contact and smile.  The pupil will now watch a member of staff passing, trying to get eye contact in a manner that shows she would like an interaction.

### Impact of the project on pupils' engagement and motivation

Pupils' engagement and motivation has improved throughout the project. This has been very significant. For example, Pupil 'E' had previously been disengaged in the activities in class and only motivated by her own desires. Where previously she would only work for a few minutes at the



beginning of the project, listening to a favourite toy, a wind up music box, she has since progressed to an increasing variety of tasks and will now focus on a new task and complete it, working for up to an hour one to one with the CSC. On one occasion she chose a threading activity she had never done before and focused on it, completing it well with minimal help.

Pupil 'A' had been distracted in lessons, rarely trying to participate. He immediately engaged with the iPad and began to participate. Most importantly, now he is always very excited to see what might have been added to his grid when he gets his iPad in the morning.

<b>Table 2: Pupil Motivation and Engagement</b>			
<b>Pupil</b>	<b>Motivation &amp; Engagement</b>	<b>Before</b>	<b>After</b>
<b>A</b>	<p>The pupil has a very short concentration span.</p> <p>Low tolerance level when misunderstood.</p> <p>He would be disengaged during class.</p>	The pupil would play with his fingers and refuse to look at the class work.	<p>He focuses in class, participates in the lesson and demonstrates a level of knowledge of which the staff had previously been unaware.</p> <p>He is always excited to check what has been added to his grid when he arrives in school.</p>
<b>B</b>	The pupil would focus on sound making, not engaging with the class.	Inappropriate shouting out.	Participates actively in class. During registration activity, he will select the next person on the board. He can choose activities to share with others.
<b>C</b>	Distracted. Low level of focus. Agitation.	Fidgeting, twiddling and looking for other focus away from the lesson. A little bit of distracting naughtiness.	Participates and contributes in class. Can clearly demonstrate learning and understanding by reinforcing his spoken word with the electronic output.
<b>D</b>	The pupil is motivated and engaged dependant on prior experience.	He would participate if he thought he would enjoy the lesson.	There has been no change.
<b>E</b>	Disengaged. Used behaviours to get what she wanted.	<p>The pupil would throw any item she was given if she didn't want it. If she wanted something she would take it. She would be engaged one to one for a maximum of 5 minutes.</p> <p>She would not complete a task.</p>	<p>The pupil will take and return items she has chosen via the communication aid.</p> <p>She will complete a task she has selected even if it is not a task she likes.</p> <p>She will work continuously, one to one, on these tasks.</p> <p>She has completed tasks of which it was not known she was capable.</p>

### Impact of the project on pupil communication

The iPad with The Grid 2 software has significantly aided communication. While pupils would previously only point, gesture or call out a single greeting word, they will now use the iPad to start a conversation. While Pupil 'B' would shout out, sometimes inappropriately, he will now use the iPad to communicate. Pupil 'C' would 'chatter' but had word finding difficulties. He will now put a great deal of effort into working with the CSC to get symbols onto his grid in order to hold more complex conversations using his iPad.

<b>Table 3: Pupil Communication</b>			
<b>Pupil</b>	<b>Communication Level</b>	<b>Before</b>	<b>After</b>
<b>A</b>	The pupil would point briefly or glance briefly at an item. PECs cards had been tried with limited success.	The pupil would point briefly or glance briefly at an item.  Picture exchange and Supertalker with six pictures.	Now he will use the iPad in class and the playground where he will communicate with others as well as participating in class. He is less focussed on himself. Staff are now aware of his favourite activities.
<b>B</b>	Shouting rote learned words inappropriately.	The pupil knows a few words, some inappropriate, which he would call out.	When he has the iPad, he will use it to communicate wants, needs and choice making as well as participating in class.
<b>C</b>	Vocalises but had word finding difficulties. He would mumble to hide the fact he didn't know the correct word. He had one word for things such as 'Sleepy' for anything associated with the bedroom. Had used photos and symbols. Weekly speech therapy.	Would vocalise convincingly which led staff to believe his problem was enunciation. He would only use single words. He would not try to clarify if he was misunderstood.	The pupil uses the iPad to relay more complex information and to clarify when he feels he has been misunderstood. He is demonstrating a high level of understanding and memory.
<b>D</b>	Single word speech	Communicates using PECs successfully.	His word level has increased. He continues to have more confidence in the PECs for communication.
<b>E</b>	Non verbal  Tried all usual methods. Real objects, photos, with limited success.	Would communicate through aggressive behaviours.	Will use the iPad to make choices.  Will use eye contact to invite communication.

## Next steps

This project will continue for the next academic year. The school want to embed the use of the iPad as a communication device within the total communication culture of the school, for those pupils for whom it is appropriate and successful.

The project has had a significant impact on the pupils with respect to communication, motivation, engagement and lessening of instances of challenging behaviour. The project will continue to be developed and extended for these pupils. The pupils will use the iPad in class and the vocabulary will be extended to support each pupil's learning.

Following the success of the iPad project, each pupil will continue with an evolving grid to support their learning. Where the iPad is not yet being used in class, with some training and support for teacher and pupil, the iPad will start to be used in class for all the pupils.

It is also hoped that the pupils will be able to access an iPad and grid at home with the support of the Communication Support Coordinator.

Table 4: Next Steps	
Pupil	
A	Meeting with parents. Negotiate vocabulary for home device. Now he is confident, the skills are established. Now he can use a device at home.
B	The pupil needs more work in school to be done, both one to one and in class. He needs to work on consolidating his skills and use them in different areas around school.
C	The vocabulary is being extended as needed in class to cover new topics. This will be through negotiation with teachers.  Now he is confident, the skills are established. Now he can use a device at home.
D	Will continue with the communication system which works for him.
E	Once she works consistently, the selection will be reduced and work one to one with CSC in class. For shorter periods initially.  There must be staff professional development incorporated.

## Teachers

Staff learned quickly for whom the iPad would work as an effective communication device.

- The pupil showed interest in the iPad and the display.
- The pupil would have had no previous iPad contact, no learned swiping behaviours with reference to the iPad screen.
- The pupil immediately took an interest in the pictures or symbols on the grid on the iPad.
- Reinforcement with a reward encouraged the pupil if no immediate interest was shown. Some pupils were more difficult to motivate just with the iPad.

The iPad is seen by staff to work best as a communication device where pupils show an immediate interest in the iPad.

### **Teachers overall perceptions of the impact of the iPad on the pupils**

Staff interviews have highlighted a number of key outcomes which demonstrate that the iPad can be used as an effective communication tool:

- Giving the pupils a voice.
- Giving the pupils a tool with which they can demonstrate their abilities more accurately.
- Increasing engagement of the pupils in their learning.
- Enhancing motivation of the pupils to participate in their learning.
- Confidence in the clarity of communication.
- Increased building of respect between pupil and staff.

Together with these outcomes teachers also reported that where a pupil has been successful in using the iPad as a communication aid, their challenging behaviours have lessened.

Once the teachers recognised the impact the iPad as a communications device could have, they were committed to using it to help the pupils' learning. The classroom teaching and support staff recognised what symbols each pupil required on their device. The support staff collected and collated photos, symbols, and any other information required to update the grid appropriately for the pupil, in an electronic form. For example, if a new sensory story was to be started in class, photos of the book and individual pages and any particular grid structure required for lessons would be collected.

Each teacher interviewed gave their opinion that the device was improving engagement, motivation and learning, but in particular, that pupils were demonstrating learning which was beyond the results of their previous assessments. The staff were very excited to see the pupils participating in class in ways they had never been able to do previously, before they had access to the iPad as a communication device.

Teachers also reported that the use of the iPad as a communications device had had a beneficial effect on pupil learning and there was evidence of improved learning outcomes. A common theme was that the staff were delighted to discover that the pupils understood much more than they had previously displayed. Once the pupil was using the device, the staff worked hard to make class work available to the pupils on their device.

### **Teachers overall perceptions of the impact of the iPad on staff personal development**

The staff themselves had found the iPad to be easy to use and reliable, which increased their own confidence in using the technology. A number of staff came forward, asking to take part in the project on behalf of their pupils and themselves, as they had recognised the benefits in other pupils and were passionate about bringing the same benefits to their own pupils.

The teachers reported that they felt the pupils had been empowered and given a voice which enabled them to communicate, to engage with staff, to participate in class and to demonstrate their learning which in turn increased their own confidence and the staff's confidence in the pupils' clarity of choice and their desire to communicate. Staff began to engage more positively with pupils as it was possible to have a conversation beyond a simple greeting.

### **The Head teacher's overall perceptions of the impact of the iPad on the pupils and staff across the school**

The Head teacher reinforced these findings regarding teachers' reports on the impact of the iPad as a communication device on pupils. From her own observations and from reports that had been made to her, there was clear progress being made. She expressed a concern that the pupils had not previously had this kind of support and she was determined to ensure that the pupils would, in the future, be supported in making the most of this technology to support pupils' communication.

The Head teacher confirmed that the post of Communications Support Coordinator (CSC), who was in turn supported by the ICT Coordinator, was crucial to the success of the project. Working one to one with the pupils in order to teach them to use the device enabled the pupils to demonstrate they had attained the benchmark of cause and effect. The dedication of the CSC, updating the pupils' grids by the end of each day when required was also recognised as fundamental to the project's success.

### **Technology**

The teachers all agreed that the ease of use and reliability of the iPads helped them and the Learning Support Assistants (LSAs) to gain the confidence to use the technology in the classroom with pupils.

As the iPads require technical maintenance; regular software updates and recharging, the teachers developed systems in order to ensure that the iPads were charged and ready to use when the pupils arrived in the morning. The IT technician was very supportive and effective in his role in supporting the technology. This was also reported as essential to the success of the project. Where difficulties developed, he would solve problems quickly and effectively.

### **The wider community beyond the school**

The iPad devices have not been used to a great extent in the wider community as yet, however, the vision is that as this technology will be adopted in the home environment.

The school provided the following example of wider community use:

One pupil, who would rarely eat (he would take food from only one member of staff and drink from another), used the device at Breakfast Club, held at a nearby restaurant, to select his meal. Staff were surprised when he chose orange juice and porridge. They were delighted when he ate and drank a little of both items. This pupil would usually refuse to eat or drink in this situation.

Pupils appear to feel more confident in using the device outside of school such as, at the Breakfast Club. The pupils appear to feel less conspicuous than they do with other devices such as the Big Mack or Super Talker.

It is hoped that families will get their own device, on to which they can download the free Grid Player app. The school can then support the family in accessing their children's grids outside of school. Through this interaction with families, it is hoped that relationships with families can be improved and parents further engaged in their child's learning in order to enhance all aspects of the child's well being.

## Key Outcomes

The school has highlighted the following key outcomes:

- Where a pupil has been successful in using the iPad as a communication aid, their challenging behaviours have lessened.
- Pupils have been able to demonstrate a level of skill and understanding that they had previously struggled to communicate.
- Pupils have been able to learn and then to demonstrate that they are beyond the crucial benchmark of 'cause and effect'.
- Where previously, pupils might have been distracted, they were now focussed and motivated in class.
- Pupils were able to demonstrate knowledge and understanding.
- The pupils were able to build deeper relationships with staff and other pupils.

Teachers reported that they and the other staff have a greater confidence in and clarity about the pupils' choices. Because of this improved dialogue, trust and friendship has developed further. The staff are beginning to 'know' the pupils. This is illustrated by contented smiles and improved relationships. They are, quite simply, happier.

## Conclusions

A tablet device together with appropriate software, such as the iPad and Grid player app, can be an effective and affordable communication tool for pupils with communication challenges.

This project has had a lasting effect on the pupils' communication skills. It was a pilot project which will be rolled out across the school next year. It is also intended that iPads as communication devices, with the appropriate software tailored to each individual pupil, will be available for them to use at home and in the wider community.

Where pupils are empowered with this voice, they are motivated and engaged in learning. The pupils can demonstrate their abilities, which receive praise and they are able to communicate their needs and wants, which can then be met appropriately. This level of communication reduces pupils' frustration and lessens the frequency of challenging behaviours. This goes on to build confidence and engender trust and respect between themselves and other pupils and adults.

Pupils are able to greet others and learn to make and build relationships through the iPad as a communication device. They are also able to share ideas, feelings and experiences in a way that most people take for granted. This supports their basic human rights as outlined in the United Nations Convention Article 24. This all serves to improve confidence in and respect for the pupils as individuals, which has been enhanced by the pupils' ability to communicate using the iPad. It can, indeed go a long way towards fulfilling their human rights.

The pupils are therefore more able to achieve their potential. A greater sense of self worth, resulting from their ability to communicate, affords them greater dignity. This in turn facilitates their effective participation in society.

## Recommendations

It is recommended that tablet devices paired with communication software, such as the iPads and The Grid 2, be provided to pupils with communication difficulties to enhance their ability to participate fully in their learning, in relationships at school and at home, also in the wider community.

It is further recommended that staff are trained to teach pupils how to use such devices and software. Staff training must also include the use of the software to produce bespoke grids for each pupil.

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Available from: <http://www.un.org/disabilities/default.asp?id=284>

## Websites

**Digilit Project Leicester** - <http://www.digilitleic.com/>

**Signalong sign language** - <http://www.signalong.org.uk/>

**The Grid 2 software** - [http://sensorysoftware.com/grid-software-for-aac/The%20Grid%20\\_aac\\_software/](http://sensorysoftware.com/grid-software-for-aac/The%20Grid%20_aac_software/)

**Zingui** - <http://www.jabbla.com/products.asp?itemID=31>

**MyTobii** - <http://www.tobii.com/>

**Dynavox** - <https://www.mynavox.com/Solutions/T10#MeetTheT10>



## Appendices

### Appendix A: Pupil 'A'

Pupil 'A' is a 13 year old boy with Severe Learning Difficulties (SLD) and Autistic Spectrum Disorder. He uses one sign: 'please' for everything which made it ineffective for communication. In class he used a Supertalker which is a static device that enables access to eight pages of eight symbols and Picture Exchange Communication System PECs; both are limiting to the breadth and depth of communication and neither motivated him to communicate beyond simple requests or participate in class.

'A' adores his friends. He is a people person. If he wanted attention or an item or help he would get eye contact and point or remain passive and not try. Without some communication aid he would not ask for food or drink. He would remain passive if he wanted help and wait for someone to go to him. If new people came he would get eye contact and point but would not acknowledge their leaving. When recognising an item he might point or ignore the item. If he was enjoying an activity and / or happy, he would laugh and clap. If he wanted the activity repeating he would bounce and sign 'please'. If there was something he didn't want he would throw it. If upset, 'I' might hit out or cry. If he didn't want something doing, he would hit out. If he becomes frustrated with his attempts at communication, he expresses some challenging behaviour, including aggressive outbursts. This is partly the effect of his medical condition.

#### Description of Technology used for Pupil 'A'

'A' previously used both Picture Exchange Communication System, PECS) and a Supertalker. These devices did not motivate him to communicate.

As part of the project; 'A' was then given an iPad with Griffin Cover and The GRid 2 to use.

#### Overview of project as it was applied to pupil 'A'

'A' loves people, especially his friends. He is motivated by people.

To gauge 'A's reaction to the iPad; the Communications Co-ordinator (CC) had an initial session with him using the iPad she had set up for another pupil.

'A' became very animated, excited and engaged when he discovered photos of people he knew. It was an instant response. He had no previous experience or expectation of an iPad and so accepted the iPad as a 'communicator' and the associated rules at face value.

CC decided that 'A' would benefit from participating in the study and collaborated with 'A's class teacher to decide what he would like and would be useful for 'A'.

As he had become so engaged with the photos, they decided to put photos of his class mates and staff onto his grid so that he could participate during registration.

CC demonstrated the use of the iPad and how to 'model' its use for 'A' to the class teacher and assistants.

'A' immediately became engaged in class using the iPad. He participated in registration activity for the first time.

The teacher recognised this significant improvement and collaborated with CC to add other options to the Grid. The second Grid included Playtime, Yes, No and Finished. If 'A' chose an option it would always be given. This is a crucial aspect of the project which increases the trust between the pupil and the staff.

Within one week they decided to add 'A's timetable. He astounded the staff by showing that he recognised the symbols and Objects of Reference (Real objects, photos of which are displayed by the symbols around the school, that a pupil can hold on their way to an activity. This object reminds them (and other staff) if they become confused or lost between activities) that were used by the school. He knew what they would be doing next. He knew the days of the week. He became more engaged in class and proactive.

The teacher approached CC regularly to have new symbols added to 'A's Grid. These were always put on before the end of the school day. 'A' knew this and would look for them, excitedly, the next morning. This kept him engaged and active.

A maths page was added and 'A' was able to demonstrate that he knew much of the work they were doing. He could count, knew his colours and shapes and was able to learn within class. It is important to note here that the teacher and assistants were careful to leave sufficient thinking time for 'A' to find his answer so that he could participate equally.

An English page was developed. This included the Stories that are used for each half term. 'A' can look at the previous and current stories and talk about them.

He is very excited to find what has been added and is proficient at navigating categories on the Grids to find what he wants, to participate actively in class and to communicate with others.

These were skills and abilities he had not previously been able to demonstrate. The iPad as a communication tool has given him a voice.

## Impact

'A' has been able to demonstrate abilities previously unknown. He has a voice in class.

His body language has changed as through the improved accessibility to the curriculum, he has become more proactive and participates more widely in class, answering questions independently.

Challenging behaviour which is due to his medical condition as well as frustration, has lessened from several times each day to every other day.

## Key lessons learnt

Pupils who are given a voice, in this case, through the use of an iPad as a communications device, are more able to demonstrate their abilities.

They are able to engage, participate in class and gain in confidence.

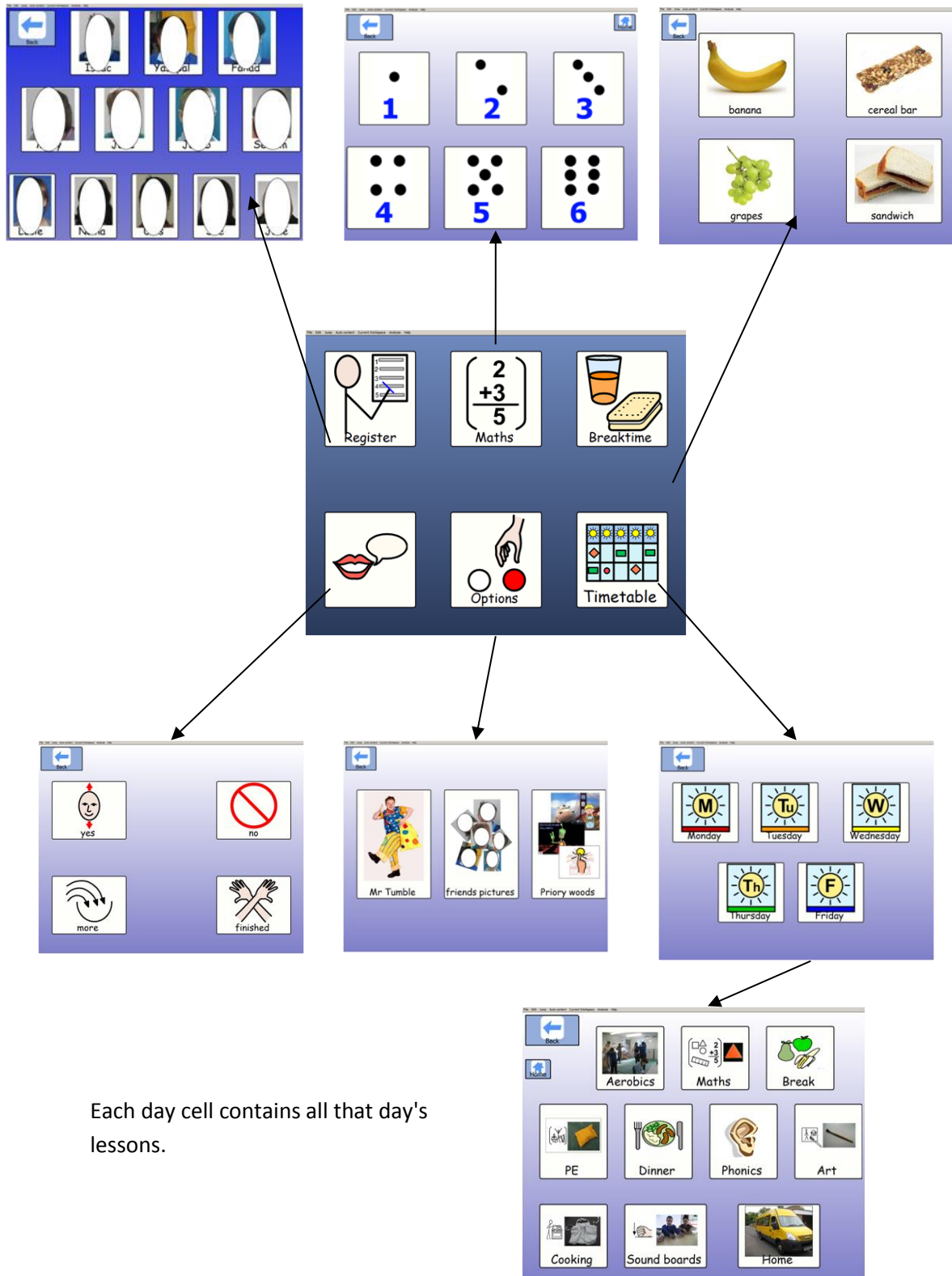
They become more engaged and motivated to learn.

These abilities enable the staff to have confidence in the pupil's choices. This engenders mutual respect.

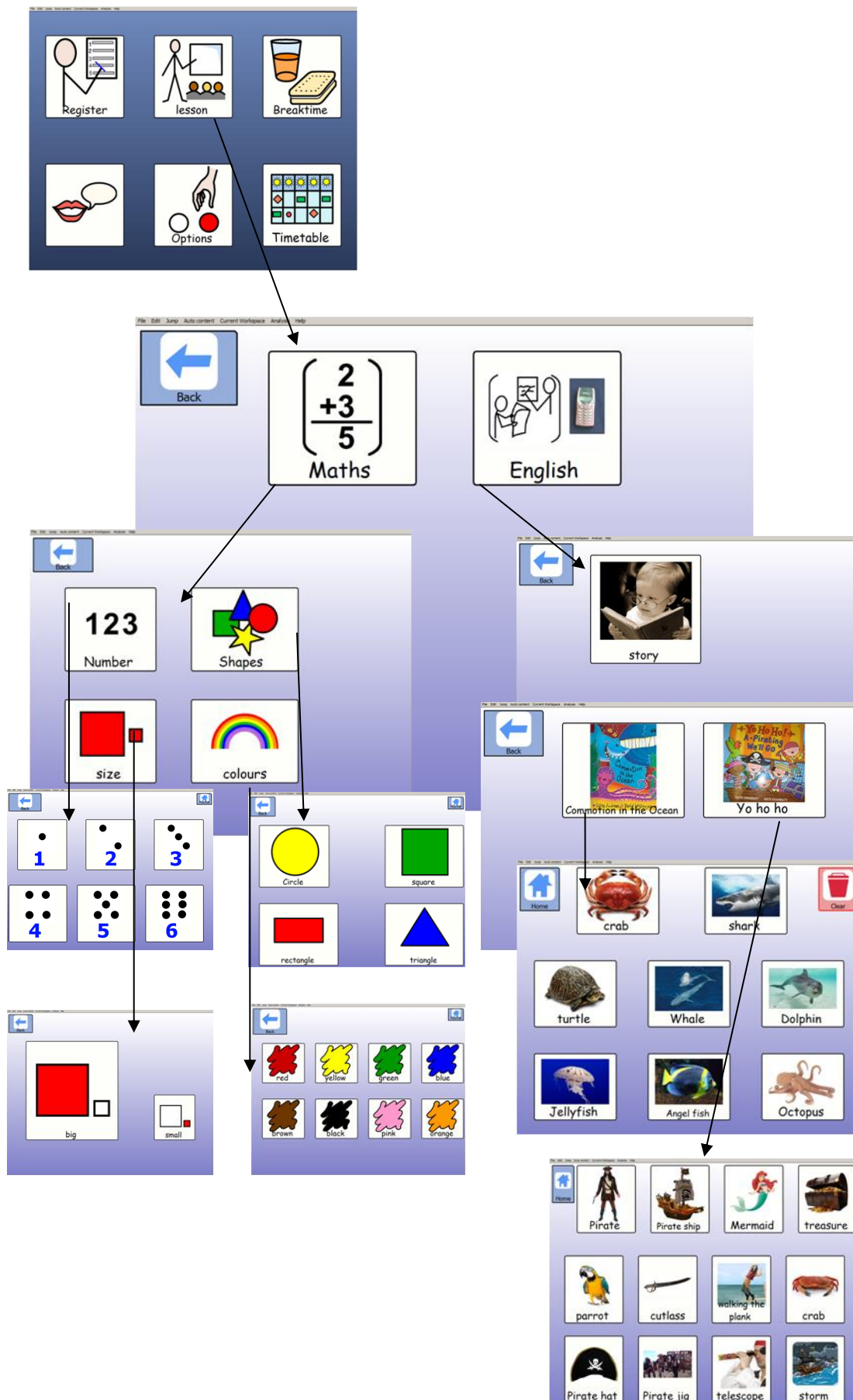
The result is an improved relationship based on mutual respect, learning and a lessening of challenging behaviours.

## Pupil A Grid

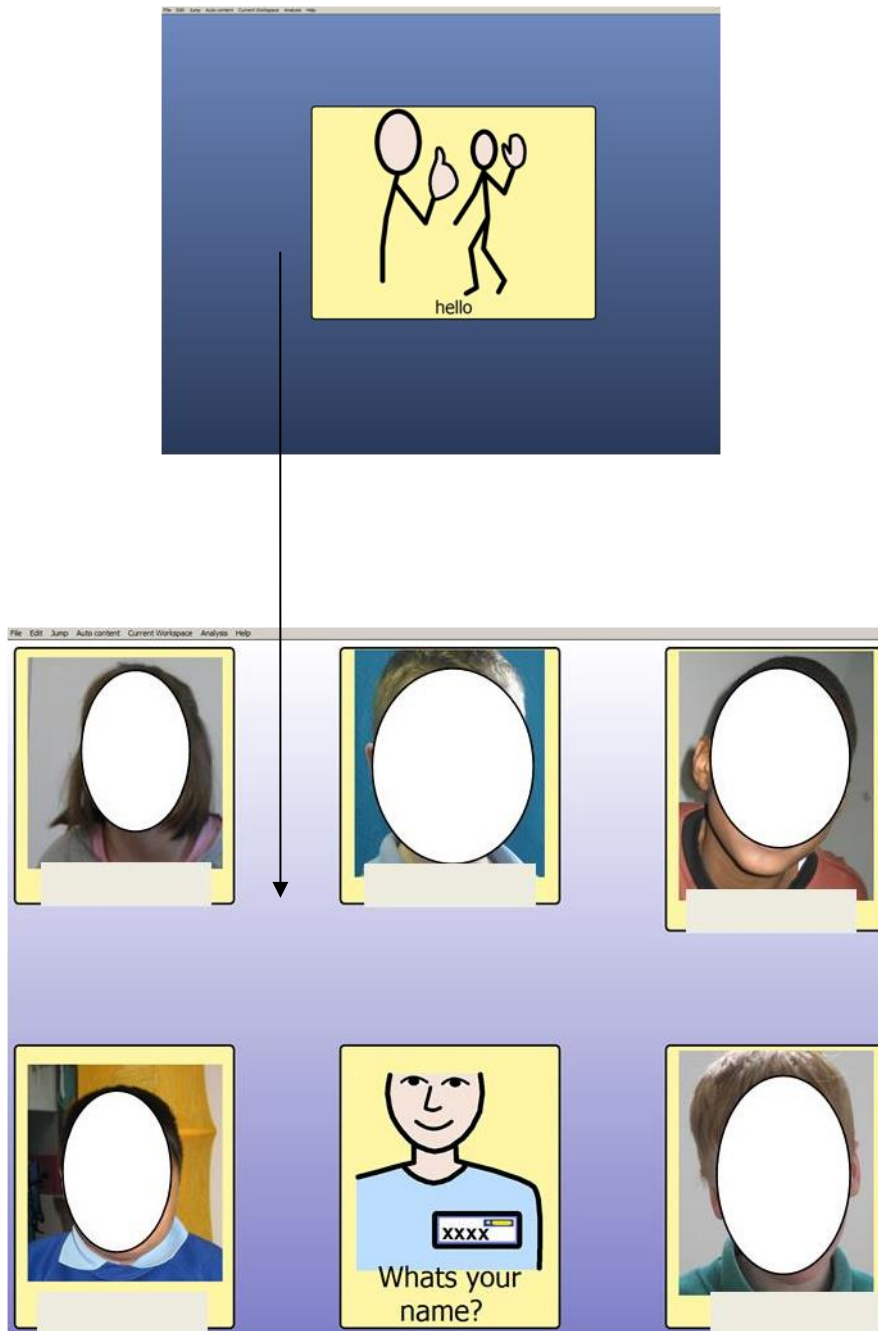
## Stage one of Pupil A's grid



## Stage 2 of Pupil A's grid



### Stage 3 of Pupil A's grid



## Appendix B: Pupil 'B'

Pupil 'B' is a pupil with Profound and Multiple Learning Difficulties (PMLD) and epilepsy. He has some phrases he uses regularly and he has some signing ability. He will sign "mine" and "my turn" when using the iPad. He has some physical difficulties so it is hard for him to hold items.

'B' attracts attention by vocalising, 'chatting' or shouting. He might call "mum" or "Hiya". Some vocalisations are not clear.

If there is an item 'B' is interested in, or wants, he will point, sometimes vocalise and may use "chatter vocalisation". He sometimes uses names although they are not always clear. He knows sounds for animals and will use those as well or instead. He will not ask to be picked up.

If he requires assistance he may shout "mum" regardless of whether she is present.

If he is enjoying an activity, he will smile, laugh or vocalise in a 'happy' voice. He may say or sign "more". He will look at new items. If there is an item he doesn't want, he might say "No", throw it away or close his lips if it is food.

If a familiar person comes in, 'B' will look, vocalise and may shout "hiya". He may wave and say "bye" when they leave, often only after prompting.

'B' is happy to accept help and if hurt or upset, he will put on a serious face, go quiet and stare at any offender.

### Specific technologies used for this pupil

'B' used a Picture Exchange Card System (PECS) in class but had difficulty in holding the cards and they would frequently drop.

As part of the project; 'B' was then given an iPad with Griffin Cover and The GRid 2 to use.

## Overview of project as applied to pupil 'B'

To begin with, the Communications co-ordinator (CC) programmed 'B's Grid with four choices associated with a ball - a favourite toy.

The choices were 'Roll', 'Bounce', 'Give Me' and 'Happy'.

'B' had one to one sessions with the CC twice a week. Extra sessions would be added in if they became available.

CC worked with the iPad, maintaining 'B's signing at the same time. Over the first 4 weeks, 'B' came to be able to activate the Grid symbols and to understand what was required. Then the Grids could be updated with a selection from Ball, Bubbles, Car and Sound Box with separate activities for each. 'B' showed intent. He cooperated and participated enthusiastically in the sessions.

After 10 weeks 'B' was able to use the iPad in class. He was more engaged and participated in the class activities. He had more understanding of what is being said.

He developed from knowing 2 colours to 4 colours. He can use the chat Grid but won't use it around school as yet.

## Impact

Pupil 'B' has been empowered through using the iPad as a communications device.

He can participate in the class registration activity; matching photos to people and anticipating the next person on the register.

He uses his vision to good effect and can participate in a 'Kim's game' activity.

When choosing a toy, he always selects the car, while he is less consistent with the cards. This has given him more effective choices.

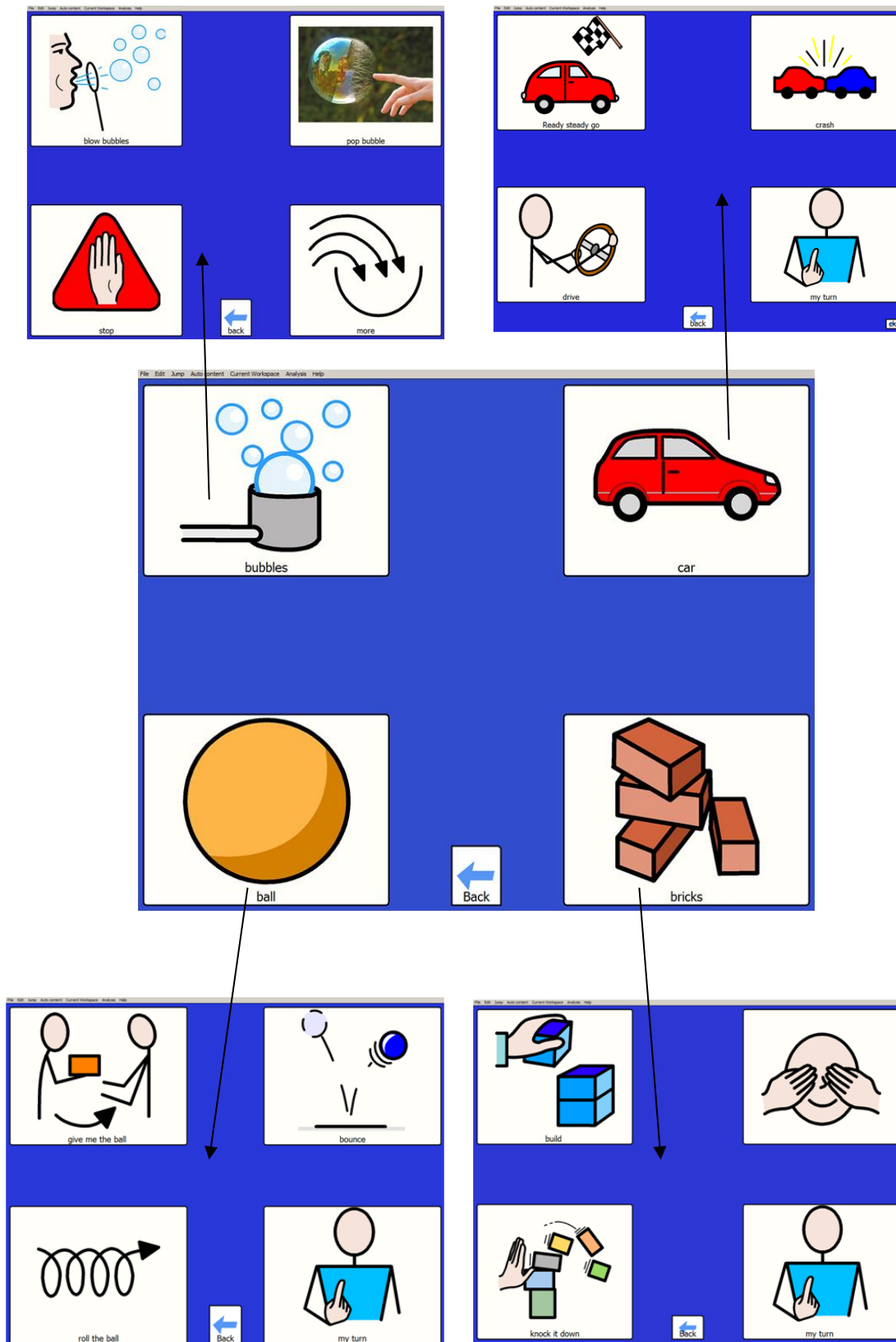
## Key lessons learnt

Empowering pupil 'B' and giving him a voice, has engaged him in his learning and he is more motivated in class.

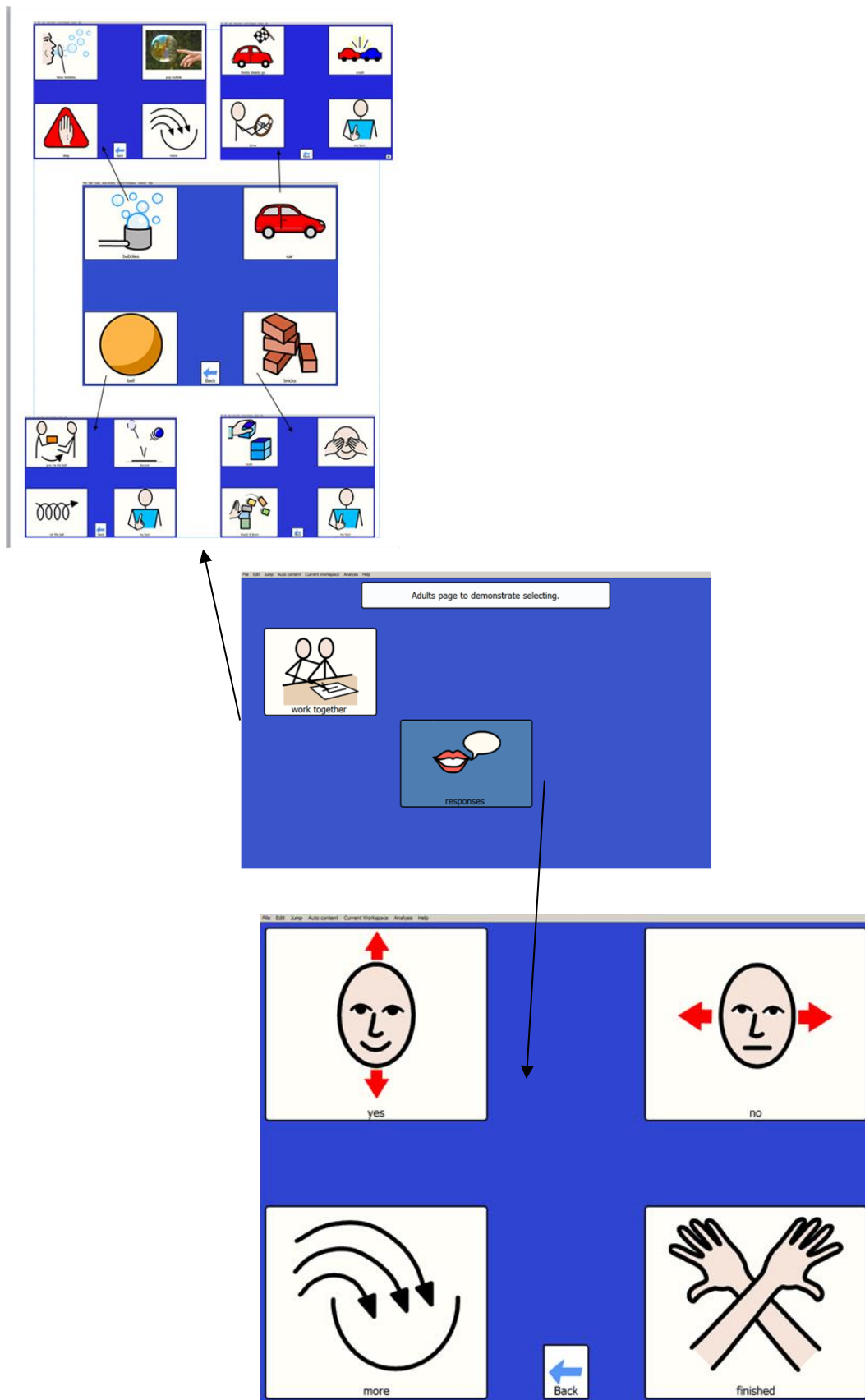


## Pupil B Grid

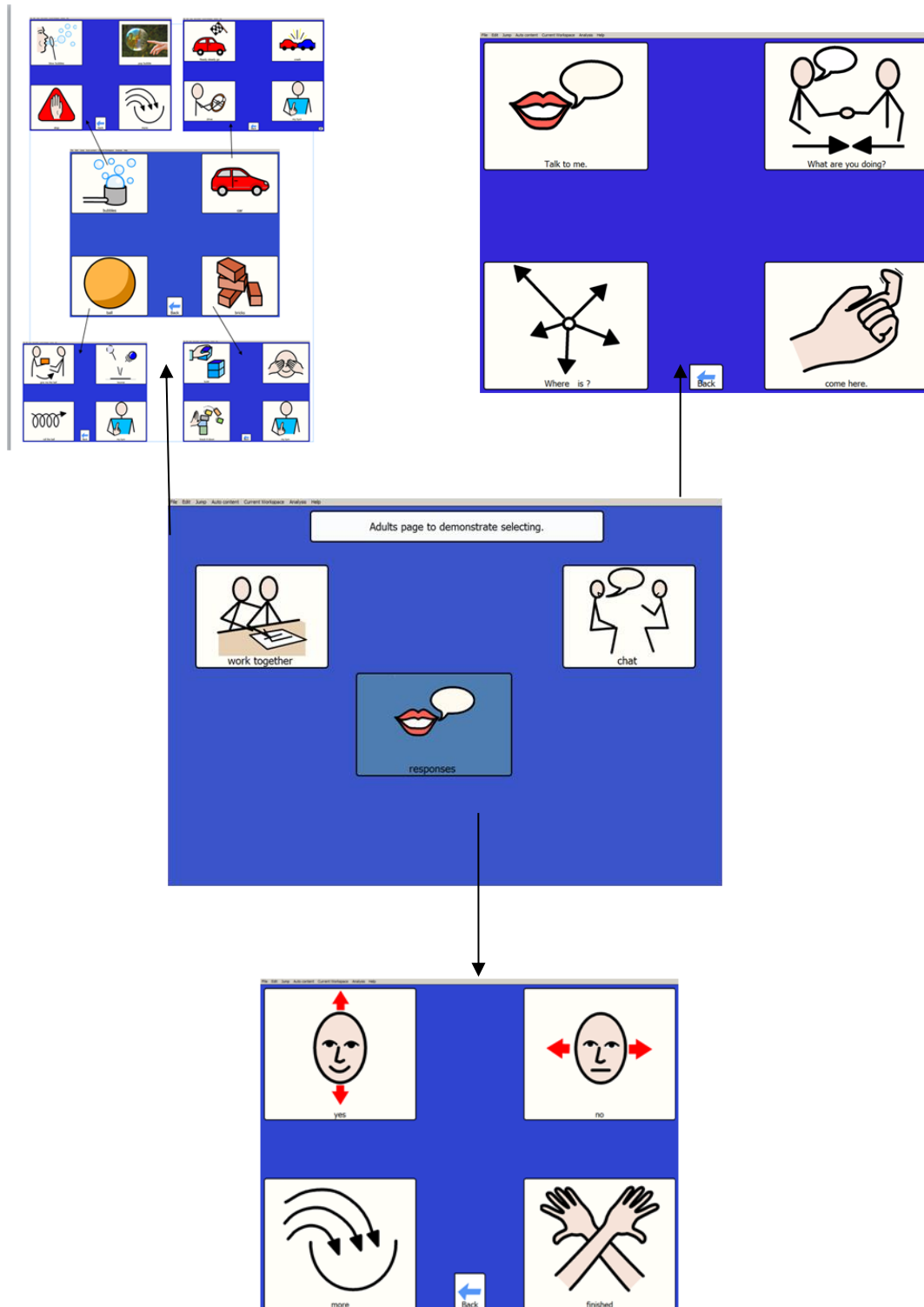
## Stage 1 of Pupil B's grid



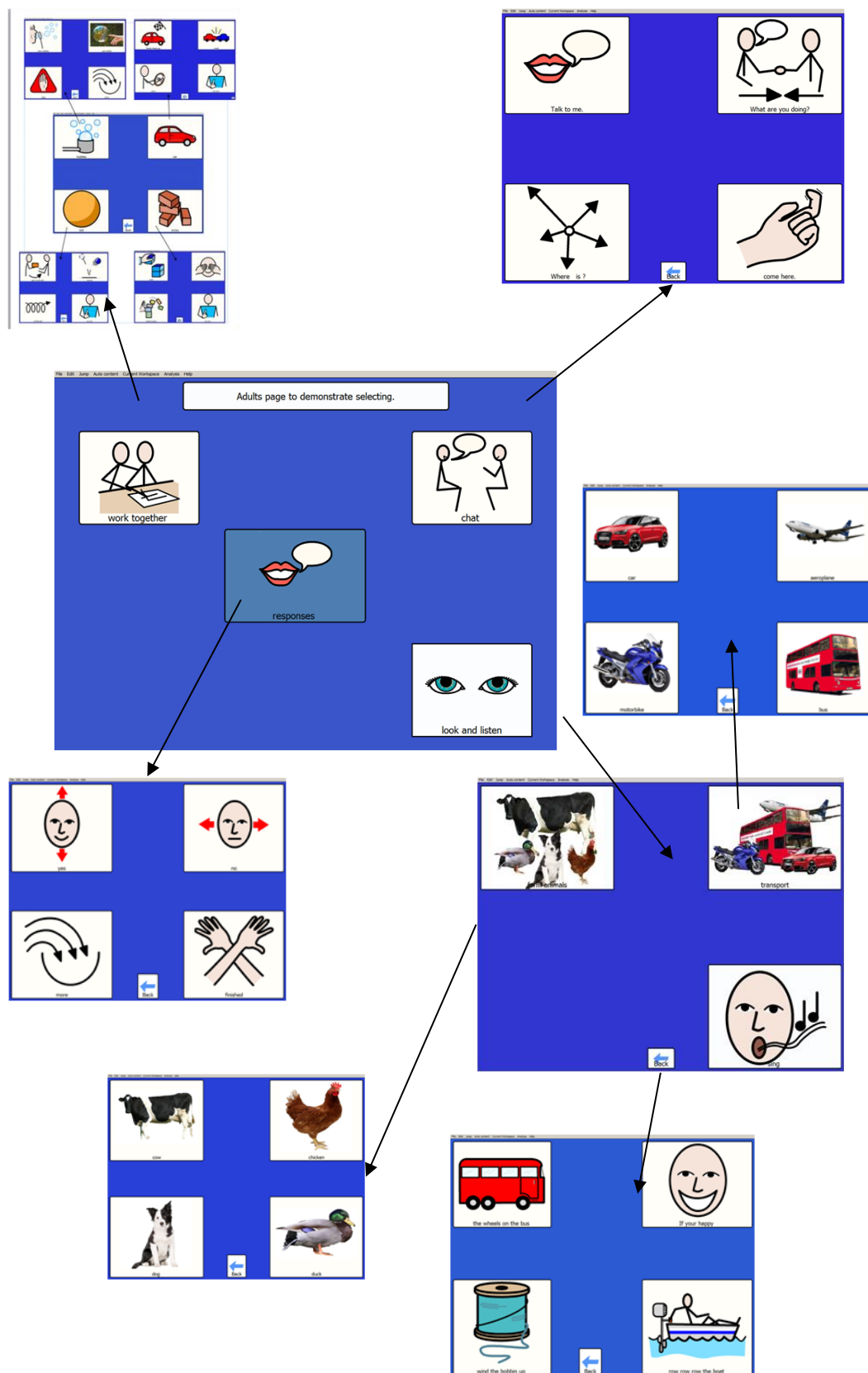
## Stage 2 of Pupil B's grid



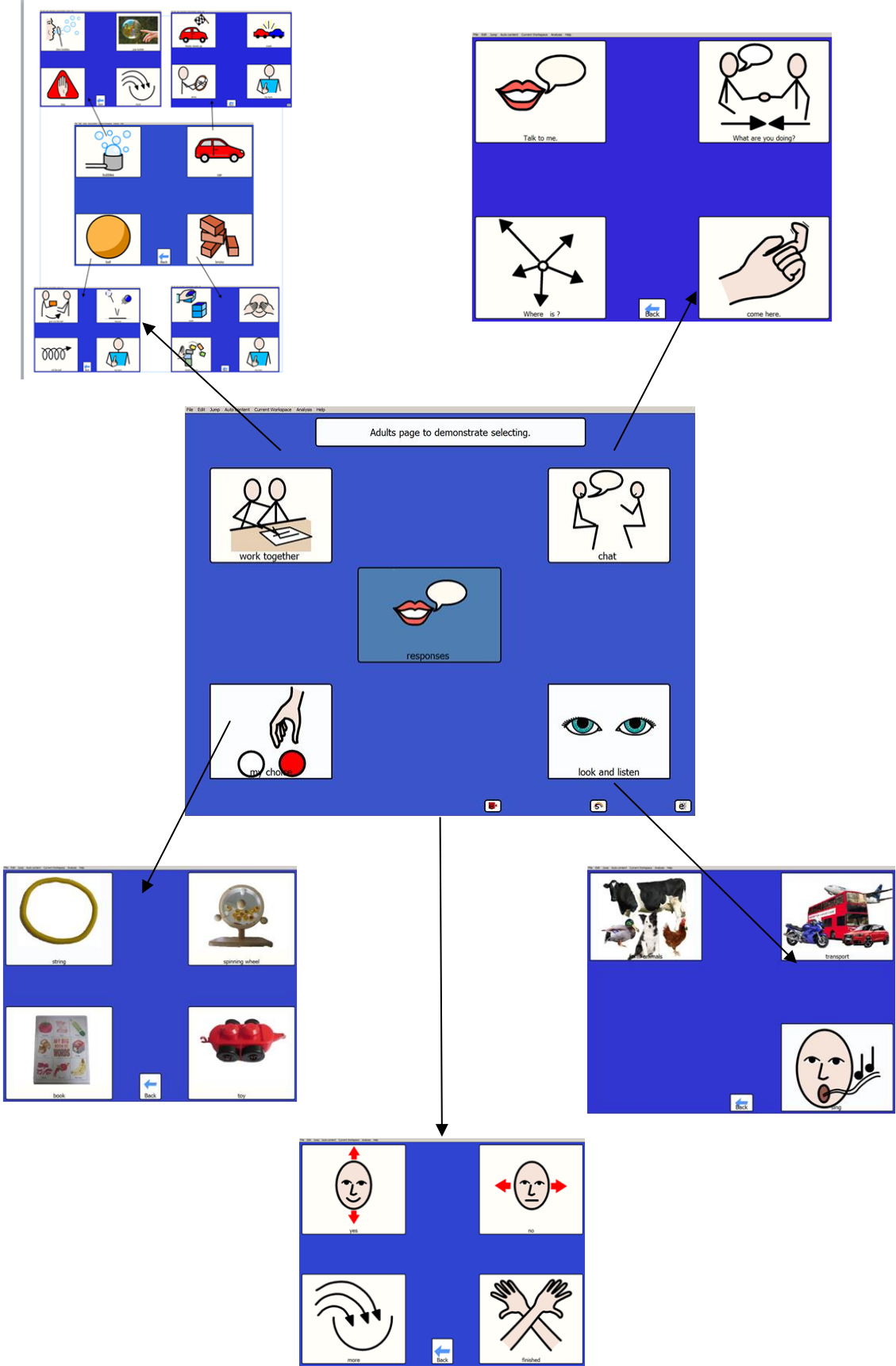
**Stage 3 of Pupil B's grid**



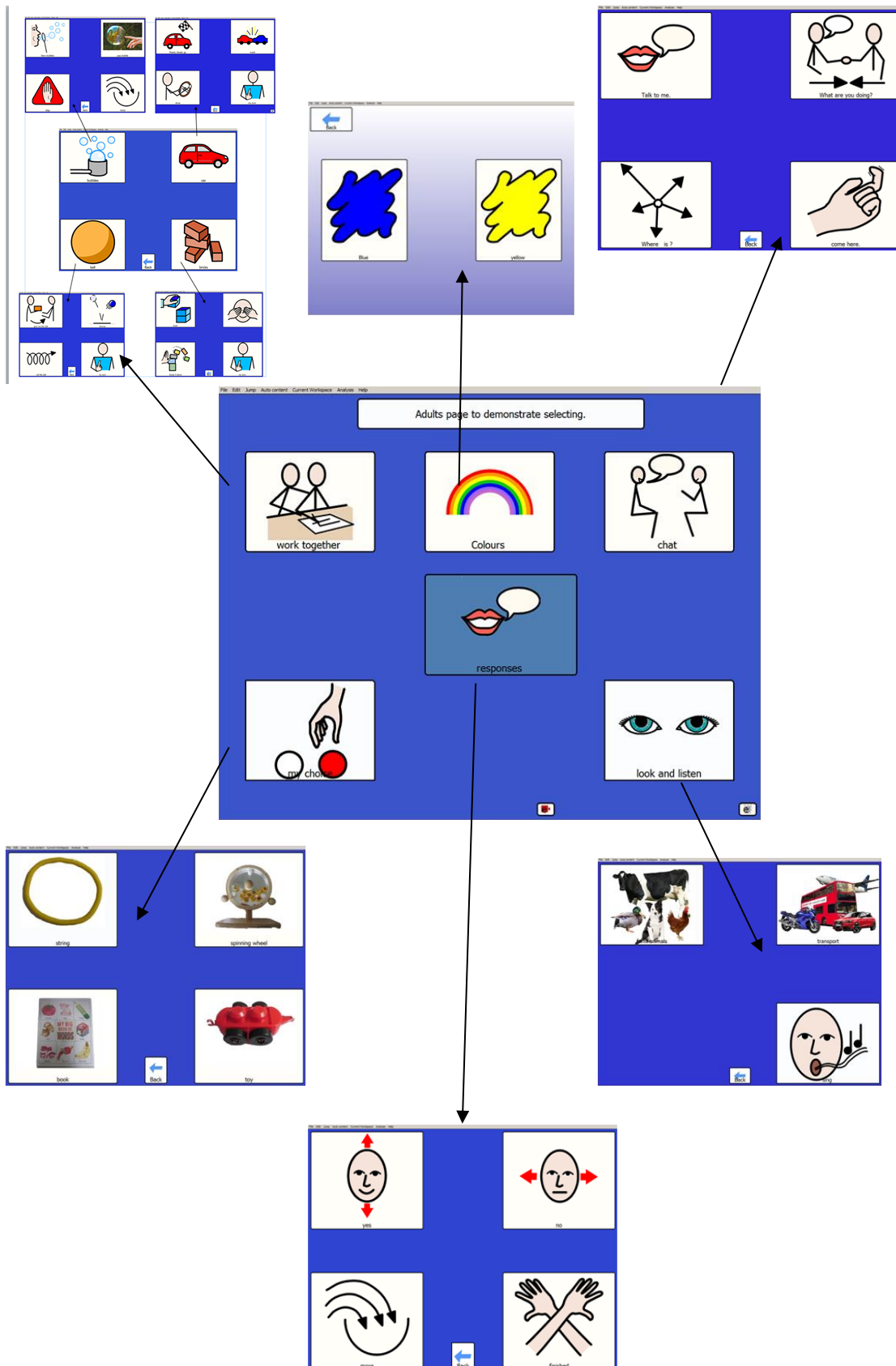
**Stage 4 of Pupil B's grid**



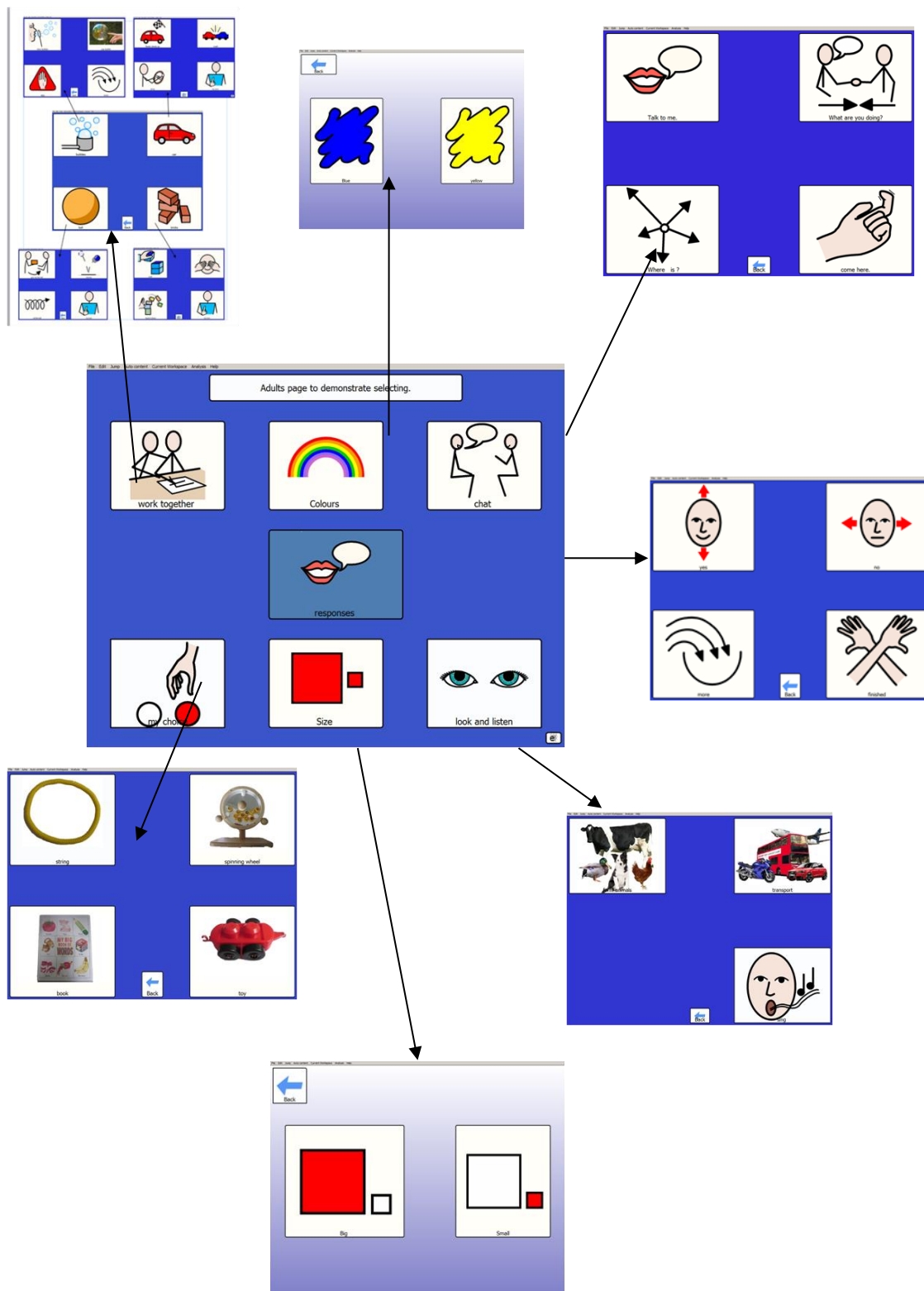
Stage 5 of Pupil B's grid



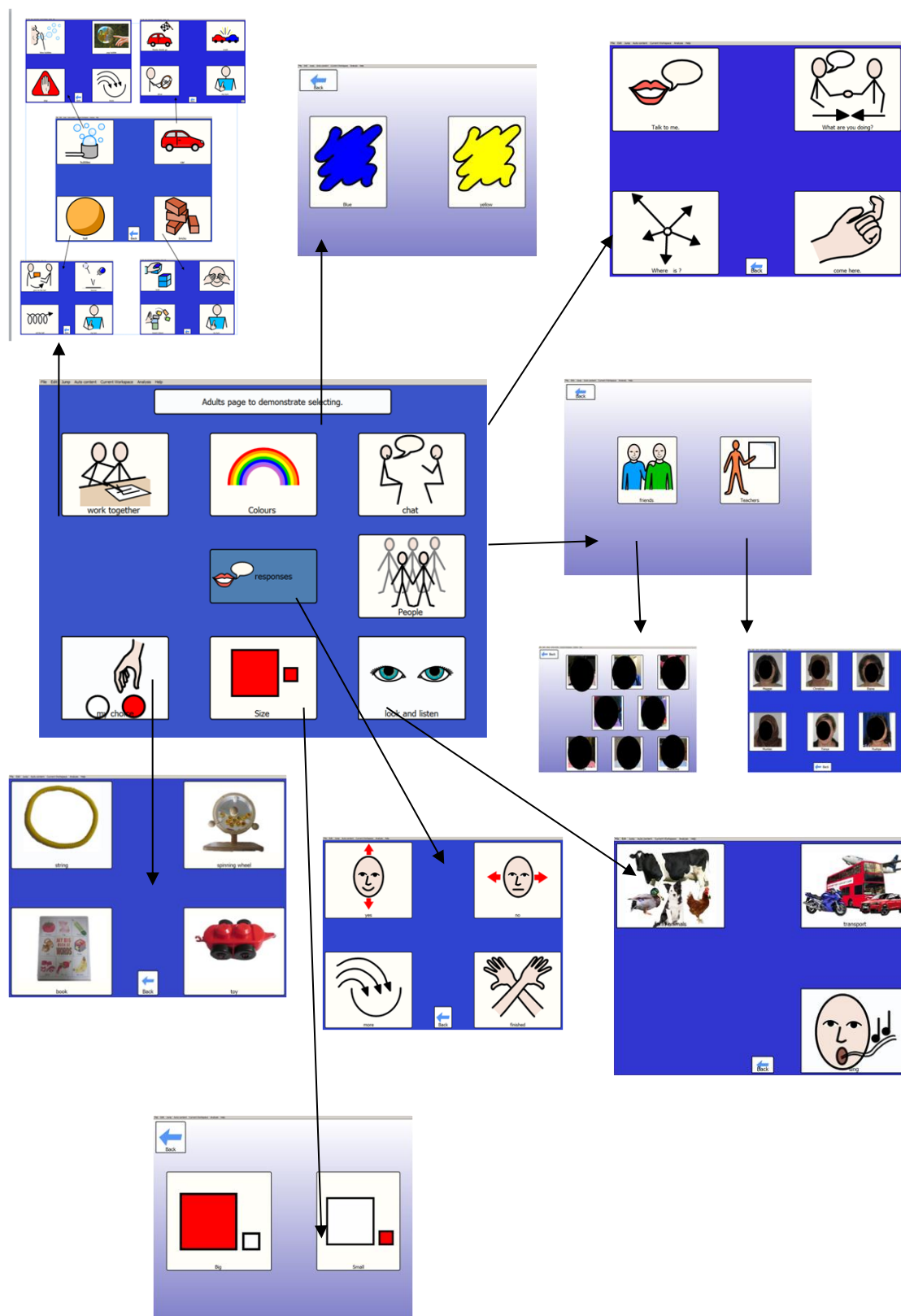
## Stage 6 of Pupil B's grid



## Stage 7 of Pupil B's grid



### Stage 8 of Pupil B's grid





## Appendix C: Pupil 'C'

'C' is a pupil with Severe Learning Difficulties (SLD) and Downs Syndrome. He is very loud, boisterous, dramatic and confident. He will attract attention by dancing, calling a person's name, vocalising and 'chattering' dramatically. It was initially thought that this dramatic 'chattering' was conversation and that 'C' had difficulty with pronunciation. He will point at an object that interests him and 'chatter'. He can use some single words such as 'Sleepy' but it became apparent that he used a single word for a concept. 'Sleepy' was used for anything relating to his bedroom. He will sign and back up his vocalising by signing.

He has used his personality to convey more ability than he actually has.

'C' is very friendly and likes to hug people when he greets them. He will say "Hi" or "Hello". If 'C' wants physical contact, he will cuddle a person. Work is being carried out to encourage him to shake hands instead. If a person is leaving he will wave.

If he needs help, he will call out "'help" or "oi!".

If he is enjoying an activity he will smile, laugh, clap, say something like "I like it" or "It's fun" and say "more" or "again" to repeat the activity.

'C' enjoys his food but if he doesn't want something he will say "no".

If 'C' is hurt or upset, he will use his dramatic tendencies to make the most of the situation if he can.

If he wants to do something for himself, he will say "Me" or "I want to do it myself".

When identifying an object he will make a related sound such as "Miaow" for a cat, saying its name or using a word of his own.

### Specific technologies

As part of the project; 'C' was given an iPad with Griffin Cover and The GRid 2 to use.

## Overview of project as applied to Pupil 'C'.

When the Communication Co-ordinator (CC) had her first session with 'C', it became apparent that he had less language than had previously been thought. What had previously appeared to be a pronunciation difficulty was actually 'C' using a dramatic 'chatter vocalisation' to cover up a lack of word finding ability.

Using pictures, CC discovered that for all questions associated with bedroom, night time and sleeping, he would use one word "Sleepy". When she pointed at pictures of a bedroom and its contents, he would still use the word "Sleepy". If she spoke to him and asked him to point to various named items - bed, pillow, light , he could recognise the word and point to them. However, when asked to name them himself, he would revert to the single word "sleepy".

'C' had knowledge, experience and ability but not the correct word.

They worked on written and drawn word selection maps. However, 'C' reverted to the word "sleepy" after the session.

'C' had the desire to communicate. He was able to recognise symbols but photos were used for class mates and staff.

'C' was started with symbol talker 'A'. However, he found this too complex so the number of categories available was reduced to Quick Talk and People. This was still too complex and so was further reduced to a level where he was able to navigate the grids. See the Pupil 'C' grid at the end of this section.

Over 8 weeks, one to one, twice a week (adding sessions occasionally if a session became available) CC worked with 'C' to build his Grid and for him to learn to use it. Once he was confident he was able to take it to use in class.

Once 'C' was using the simplified Grid, it was possible to start increasing the number of symbols while reducing their size. He was soon able to navigate the Grids quickly and efficiently to communicate. When asked if he would like a drink, 'C' would ask for "coke". Once he could use the Grids, it became apparent that when he said "coke" he actually wanted milk. This meant that he could make his preferences clear much more easily.

'C' then began to find CC and work with CC to add pages he needed. He had started to take control of his own communication aid.

Notably, 'C' came to CC, very excited, to ask for a new Grid because he was going on holiday and had specific requests for his Grid. Through various methods of non verbal communication, CC was able to build a Grid specifically for his holiday.

## Impact

Pupil 'C' has become more confident around his communication.

He has taken control of his communication device and uses it to explain events. Because he is so keen, he has also improved other communications with CC, as he puts a great deal of effort into 'explaining' the symbols he wants to have on the device so that he can tell others.

'C' is engaged and motivated to learn and communicate.

As he has so much to say, he is listened to and relationships have improved through the use of the device.

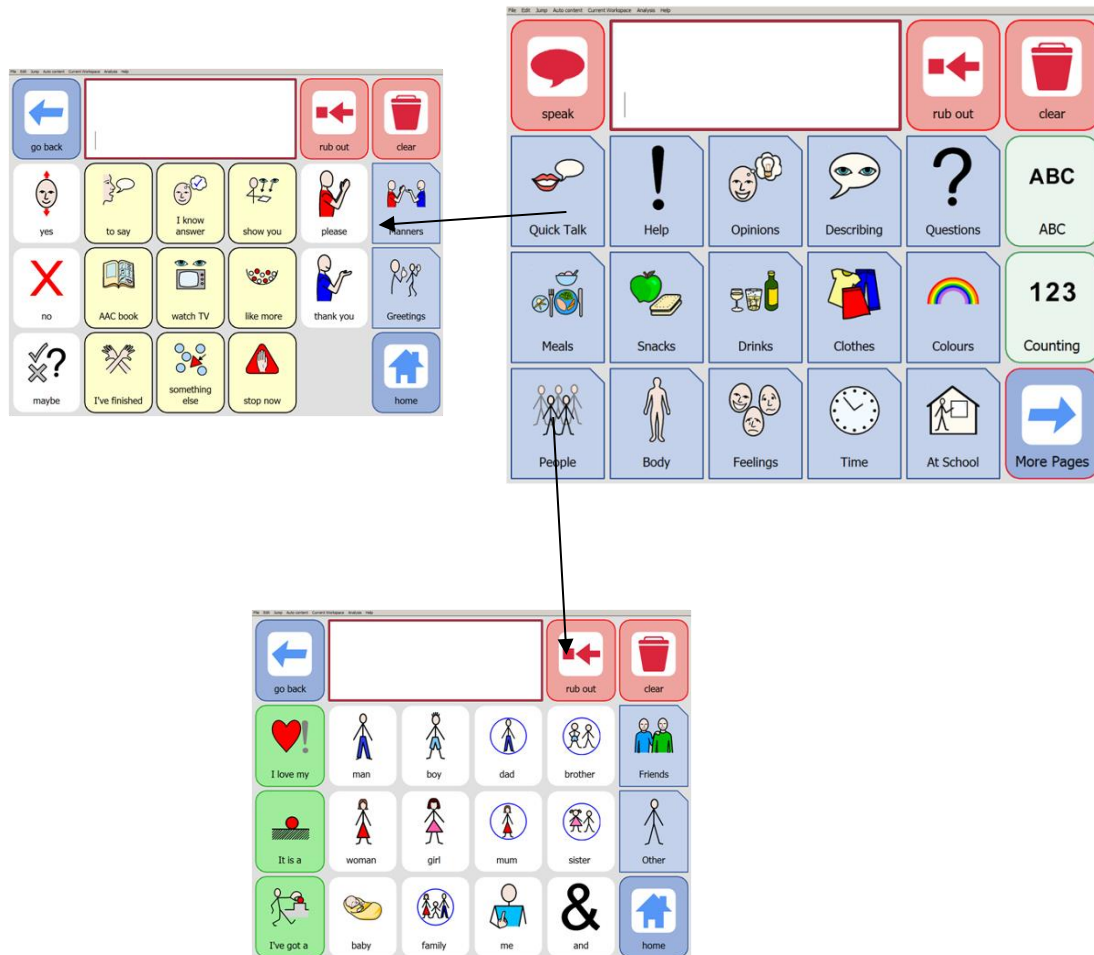
## Key lessons learnt

Empowering pupil 'C' has enabled staff to realise that he has word finding difficulties and to help him with this.

As he communicates, he is motivated to put more effort into communicating concepts to put on his device rather than 'chatter'. Staff therefore listen more carefully. Mutual respect is gained which improves relationships.

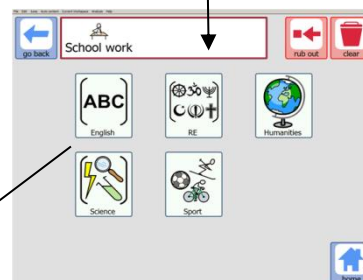
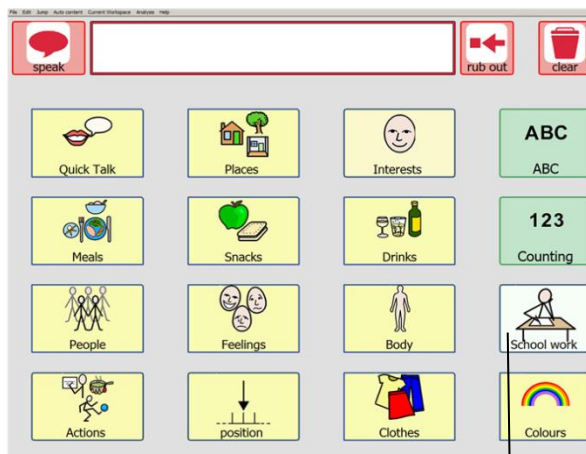
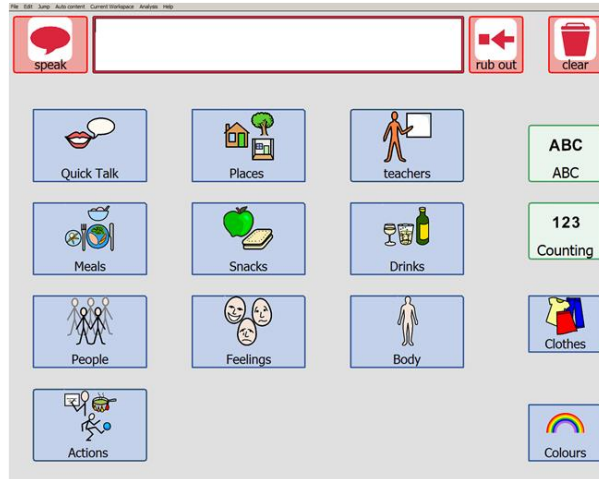
## Pupil 'C' Grid

Initially we looked at 'symbol talker A'. This was too complex so we reduced the categories

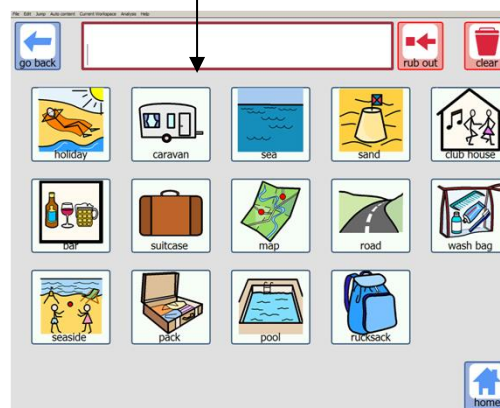
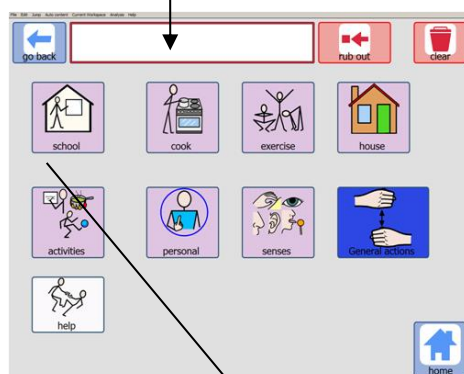
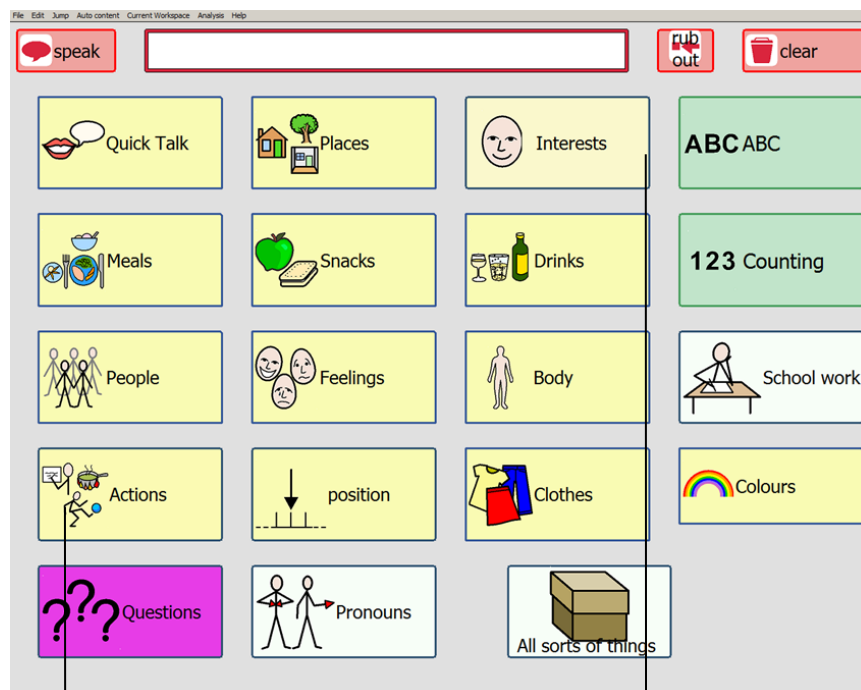


Stage 1 of Pupil C's grid





Stage 3 of Pupil C's grid



Stage 4 of Pupil C's grid

## Appendix D: Pupil 'D'

Pupil 'D' is an 11 year old pupil who has Severe learning Difficulties (SLD) and Autistic Spectrum Disorder (ASD). If he wants attention, he approaches someone, gets eye contact, take their hand, tap or hit and vocalise. If he sees an item he is interested in, he will vocalise. He might vocalise or try to sign if he wants the item. He will walk over and look at an item he wants, stand by it and vocalise. He doesn't ask to be picked up. If he needs help, he will stand and hand an object to you where appropriate.

If he wants an activity he is enjoying he smiles, laughs and vocalises. If he wants that activity repeating, he will take the person's hand, making movements and vocalising.

If there is something he doesn't want, he will leave it or push it away. He might say "no".

If a familiar person comes in he might make eye contact, smile or touch them. When they leave, he might say "bye" if prompted.

If 'D' is upset or hurt, he will cry, go away from everyone. He might get angry and hit out.

If he doesn't want help he will push a helper away.

### Specific technologies

'D' used the Picture Exchange Card System successfully. He recognises that if he gives the card he will get the item.

He used an iPad at home to play games on and recognised the iPads despite the Griffin cover. He would simply swipe at the screen and feel for the buttons to get onto other apps he liked. For him, the iPad was for entertainment.

### Overview of project as implemented for Pupil 'D'

CC worked with 'D' to demonstrate how to use the iPad as a communication tool.

However, 'D' did not recognise the use for communication and simply looked for entertainment. He would not 'point', only 'swipe'.

If 'D' wanted to communicate a desire he would look for his PECS and would only then be engaged in trying to communicate his wishes.

It became apparent that this system would not work for pupil 'D'.

However, since another pupil is using the iPad in class, he has taken a great interest and it is possible that at some later time it may be possible to work with him again.



## **Impact**

The iPad as a communications tool had no impact on pupil 'D'.

He was unable to see a different use for the iPad than as he used it at home, for entertainment.

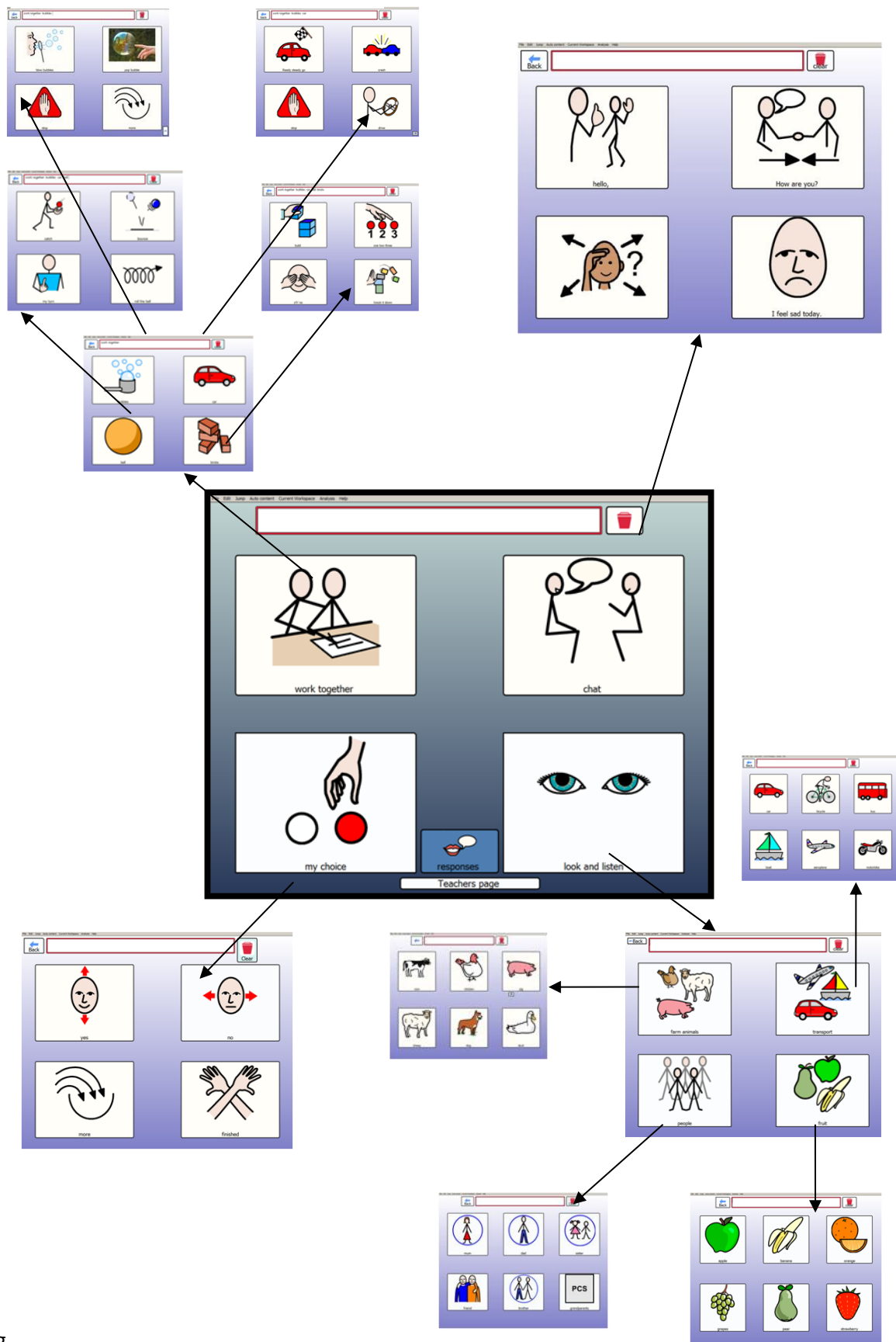
## **Key lessons learnt**

The iPad will not work for all pupils as a communications device.

It is important that pupils have little or no experience of an iPad before introducing it as a communications device. Once pupils are in the habit of swiping in a random manner, it can be extremely difficult for them to learn to use the device differently.

### Pupil 'D' Grid

### Stage 1 of Pupil D's grid



## Stage 2 of Pupil D's grid



## Appendix E: Pupil 'E'

Pupil 'E' has Severe Learning Difficulties (SLD) and Educational Behavioural Difficulties (EBD). At the beginning of this project, she would use physical methods of communication such as snatching at or pulling a member of staff or running towards an item such as a toy or food she wanted. 'E' does not like physical contact when given by others. She is non verbal and does not sign. She will make a loud agitated cry if requiring help and will cry if hurt or upset. If 'E' did not want help a member of staff was trying to give her, or wanted something someone else had, adult or child, she would push their hands away, take the item, kick or scratch. This was her way to control her environment.

### Specific technologies

'E' previously had used low technology methods of communication such a 'Big Mac' single message plastic button. 'E' also used photo cards which had to be True Object Based Icons (TOBI). They had to be photos of the actual object which were actual size.

She had some success with these but they were too easily thrown and damaged. Attached with velcro to a board, she enjoyed the tactile and sound effect of scratching the velcro which would then distract her, and could become obsessed with making the sound

For this project she used an iPad, Griffin Cover and The Grid 2 software. The starting point was a TOBI image of her favourite toy, a music box. A photo was taken and put onto the iPad true to size.

### Overview of the project as implemented for Pupil 'E'

'E' had a one to one session with the Communication Coordinator(CC) on average, twice a week. This was on neutral territory, in a small space set aside for this activity. These sessions tended to last about 10 minutes. If other sessions became available, she would be given extra sessions.

Pupil 'E''s favourite item is a wind up musical toy.

At the beginning the CC would demonstrate by touching the True Object Based Icon (TOBI), a life size photograph of this toy, saying "Ah! Music Box", getting the Music Box, turning it on and giving it to 'E' immediately she had touched the icon and heard the words in order to demonstrate cause and effect effected by the device.

'E' was shown that she was required to touch the Music Box icon on the iPad, so that the words 'Music Box' were heard in order to get the music box which was handed to her **immediately**, already playing. When the music stopped, the CC would gently take it back.

CC then worked with 'E' to show that if 'E' touched the icon, she would get the Music Box immediately, already playing. CC did not touch or move 'E''s hand to do this as this would have broken the trust as 'E' does not like to be touched.

Over 4 weeks, CC built a trusting relationship with 'E' where 'E' knew that if she touched the icon

she would get the Music Box. The icon was slowly reduced in size and began to move position on the screen so that 'E' would have to concentrate in order to touch the icon.

'E' began to hand the music box back in a proper manner in order to have another turn reactivating the iPad and getting the Music Box back, playing again.

Any unwanted actions on 'E''s part would, as far as possible, be ignored. Scratching or tight gripping would elicit no response at all from CC. This was to ensure there were no mixed messages. Only touching the icon would elicit a response.

However, as soon as 'E' touched and activated the icon she would receive the music box, already playing. The immediacy was important in order to teach 'E' the cause and effect of using the iPad. This continued over 4 weeks.

Over these 4 weeks, there was a reduced number of occasions where 'E' tried to direct and control by touching CC's hand. 'E' came to understand that touching CC's hand would not work as it had before. She had to touch the icon and would then get the music box, already playing. At this time, 'E' began to touch CC's hand gently.

As CC said, showing her hands and arms "Look! No scratches!"

During the second phase, the music box icon was made to move as soon as it had been touched. 'E' now had to know where the icon was and make deliberate movements in order to activate it.

The next item added was a photo of a tambourine that 'E' did not like. If she touched the tambourine icon, she would be handed the tambourine and had to handle it. She was not permitted to throw the item or to drop it. If she did, CSC would look at the item on the floor and say "Pick it up!". 'E' would have to pick it up and give it back in a proper manner before being permitted the iPad and to request the music box. Extreme patience was required. There was to be no fight and no contact. During this time mutual trust and respect continued to be built. As CSC said "For 'E', contact is for control."

'E' was observed, by the researcher, touching and activating the icon and glancing as it moved then taking the music box and touching the icon accurately when required to reactivate it without taking another look. This was repeated by 'E' and demonstrated that 'E' remembered the position to which the icon had moved.

The grid was further developed to include three items.

A Sound Shuffle that required 'E' to activate step by step, 6 or 7 times, to listen to a complete song, which varied.

Bricks which she had to build and take back down again.

A cardboard 5 page picture book with a sensory cat's tail was then added to make 4 items. 'E' did not like the book. However, if she chose it she would have to hold the book, turn the pages and look at every page before she was permitted a new choice.

The tasks have been made more challenging by removing the music box and adding a sorting and threading activity  
a jigsaw,  
the sound shuffle and  
mark making with pencil and paper which 'E' does not like.

However, she has to complete each activity before she is allowed to make a further choice.  
Over this time, the reward of the item has become less immediate although is consistently given.

## Impact

'E' no longer scratches and grips tightly during this activity.

'E' now will touch CSC's hands gently. She picks up items dropped.

'E' touches the iPad. 'E' is more relaxed and confident.

She attempts all activities. While she tries to give the pencils back during the writing activity, she does it gently.

She has learned that if she touches an icon she will get that activity.

'E's body language is more relaxed. She gives eye contact and smiles. She will hum the song from the sound shuffle even when it isn't playing.

She is able to maintain a session for up to an hour. When given the sorting and threading activity she managed to do it with minimal help on the first attempt.

The jigsaw activity improves throughout the session although not from session to session.

'E' also has improved interaction. She will now stop the music box so that the picture on the actual music box is exactly the same as that on photo on the iPad. This differs for different photos and she stops the music box at the appropriate place for whichever photo is showing. This wasn't an intentional on the part of the CSC, but entirely Pupil 'E's choice. This demonstrates an even deeper level of engagement and understanding.

'E' will follow CSC with her eyes if she enters the classroom. This suggests she is hopeful of being taken out to work.

From sessions lasting 5 minutes, 'E' will now work solidly with CSC, using the communications device, completing a variety of activities, for up to an hour.

### **Key lessons learnt**

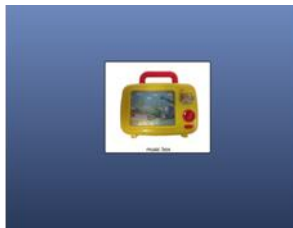
Empowering the pupil has given her a voice, and some control over her environment. This has led to a reduction in challenging behaviours.

Giving a pupil a voice improves trust and therefore relationships.

## Development of Pupil E's grid



Same position



Objects move to different corner



Distraction object added



Choice of 2 objects. The chosen object appears on its own.



Choice of 4 objects. The chosen object appears on its own





Choice of 4 objects. New options added.



Future aim: 6 objects



## Appendix F: Teacher Interview Questions

MP: What are the MAIN POINTS that have emerged from this PROJECT?

1. What has the impact of the project been on the staff?
  - a. Practice IN THE CLASSROOM
  - b. Knowledge /Understanding
  - c. Anything else?
  - d. How was that effected?
2. What has the impact of the project been on the school?
  - a. Policy / Practice?
  - b. Attitudes?
  - c. How was that effected?
3. What has the impact of the project been on the pupils who took part?
  - a. Performance / Learning Outcomes
  - b. Engagement / Motivation
  - c. Behaviours
4. Do you have any evidence?
  - a. Class work
  - b. Quotes
5. What has the impact of the project been on the Community?
  - a. Parental engagement / Wider Community
  - b. Do you have any evidence?
    - i. Letters
    - ii. Quotes

LEAVE QUESTION IN ITALICS BELOW UNLESS YOU HAVE TIME AT THE VERY END

6. *What has the impact of the project been on the pupils who didn't take part?*
    - a. *Performance*
    - b. *Engagement*
    - c. *Motivation*
    - d. *Behaviours*
    - e. *Learning Outcomes*
    - f. *Do you have any evidence?*
      - i. *Classwork*
      - ii. *Quotes*
  7. What do you think are the key themes that have emerged from this research? (Recap)
- Interview 1

MP: What are the MAIN POINTS that have emerged from this PROJECT?



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