

Section 1

Heider and Jalongo (2015) state that the vision of childhood has altered in more recent years with digital media evolving and widespread internet use. They suggest that for children electronic media plays a significant role within their lives. More recently Majlinda et al. (2020) discusses that in the current day using digital tools is inevitable and that different participants concerned with childhood development should recognise both the positive aspects and risks involved in using such media devices. Furthermore Majlinda et al. (2020) suggests that it is important that parents and educators in the early years sector work collaboratively to ensure that the benefits are taken from digital media, and potential risks such as overuse of digital devices are alleviated. Sigman (2012) states that these health risks are believed to arise when children are experiencing periods of over two hours of screen time each day.

Nutbrown (2011) defines the twenty-first century as a digital age, where much of the world relies heavily on technology, when previously this has not been the case. Brito, Dias and Oliveira (2018) state that modern households are packed with digital devices, and children are exposed to them practically since birth, suggesting that with technology rapidly advancing the experiences of many children have changed. However, Yelland (2018) suggests that the change in learning within the twenty-first century is not purely digital and instead it is multimodal, with current digital technologies complimenting existing resources. So-HarWong (2015) states that because digital devices are now being used within the home, for work, communication, enjoyment and acquiring knowledge, it makes them naturally more appealing to young children, who learn the skills to communicate by observation and interaction with their family. Similarly Bandura (1977) discusses within the social learning theory that observational learning can have an persuasive effect, and that the consequence is larger when the viewer considers that the person exhibiting the behaviour is comparable to themselves, this could be a family member, such as a parent or sibling (Deeming and Johnson, 2009).

Radesky (2018) states that occasionally parents can become overwhelmed with their young children, and they may seek to use a mobile phone or television to occupy them and help keep them calm, he recommends as a way to eliminate usage of technology parents should acknowledge their day-to-day interaction dynamics between themselves and their children and identify moments when they would usually offer these devices, Furthermore, Radesky (2018) suggests that by

identifying these triggers parents should create strategies to prevent this, adding that at the very least that if parents do feel the need to give their children devices they should co-watch alongside them. Donohue and Schomburg (2017) note that when children use digital media alongside their parents or partake in co-viewing that it allows for opportunities to discuss what they are observing with the adults, and in-turn can connect what they are seeing on screen with real life experiences. Additionally Donahue and Schomburg (2017) note that utilising these opportunities during media usage can help build language acquisition and vocabulary, encourage interaction and improve relationships.

Lorah, Tincani and Parnell (2018) state that technology is creating the change for how we interact with the world, noting that children with ASD who have limited communication skills should reap the benefits of these new innovations. Likewise Sankardas and Rajanahally (2017) state that research has demonstrated the importance for children with additional needs to have the option to use digital technology, such as iPads to communicate and achieve their potential. Dryden (2017) goes on to discuss that language acquisition for individuals with additional learning needs and disabilities is supported by the use of digital technology, such as having the option of changing colours and fonts to help children with dyslexia, as well as this, devices such as switches, joy sticks and eye gaze technology can help children with physical disabilities. In contrast Chassiakos et al. (2015) states that teenagers with ASD often have higher rates of problematic media use, furthermore suggesting that adults should place restrictions on how often children engage with digital media. Anonymous (2012) discusses that for some families the cost of purchasing devices that allow their children to communicate are excessive, particularly when a person considers how quickly technology can advance, consequently this issue is essentially creating a barrier for effective communication for certain children. In addition to this Townsend, Wallace and Fairhurst (2015) discuss broadband as another barrier to technology, noting that everyday experiences are mediated by technology, however access to broadband is still problematic in rural areas.

5rights Foundation (2017) note that it is during early development that children's digital routines are established and at this young age many children take their first steps towards independent use of devices. 5rights Foundation (2017) add that despite this children do not yet have the ability to self-manage their time alone, demonstrating the need for adult intervention to prevent overuse. Chandler and Munday (2011) discuss that with the overuse of digital devices Gerbner's hypothesis

is that heavy viewing can cultivate attitudes towards what they see, stating that children may perceive what they observe on devices to be real, and in turn this could be offering them a limited view of the surrounding world. When discussing the cultivation theory Davies (2010) understands that children could be exposed to generating negative relationships with their own attitudes and beliefs in later life if they are consistently exposed to negative images of gender, race or unrealistic images of beauty. In spite of this Potter (2014) and Bar-on (2000) discuss Gerbner's theory as troubling, owing to gaps in research, with a degree of ambiguity within all areas of explanations. Furthermore they recognise that conflicting to Gerbner's theory there are some television programmes that help promote positive behaviours, which in turn offers optimistic emotional effects for children and young people.

When discussing the use of computers and the impact it has on children Cordes and Miller (2000) note that it can have a detrimental effect on physical health, such as obesity and vision problems, as well as impacting on their emotional and social development, by causing children to become isolated and detached from real life. In addition to this Cordes and Miller (2000) state that other disadvantages to using this device includes impaired creative and intellectual development, such as language and literacy and also concentration skills. As a result of this research they suggest that there is a greater need for families and schools to provide children with a healthy upbringing within their early years, inclusive of strong emotional attachments with compassionate grown-ups, practical approaches within the physical world and opportunities to experience art and literacy, in order to reduce the negative effects that could be caused.

Hatzigianni and Kalaitzidis (2018) discusses that technology is evolving in recent years and the use of touchscreens is becoming more prevalent. Burnett and Daniels (2015) note that recent iPad studies highlight how children navigate and interact with devices, and how these interactions then sit within the wider context, suggesting that behaviours observed during story-sharing around iPads is not too dissimilar to those associated with shared book-reading, such as body movements, gestures and facial expressions. Despite this Chassiakos et al. (2015) discusses that the interactive features designed to engage children when exploring e-books may actually distract from the social interaction that could be taking place between the care-giver and child, and in turn could decrease the child's comprehension. Furthermore Chassiakos et al. (2015) states that this could cause a negative effect, as opposed to the many benefits that could be gained from active parent

involvement during digital play and book reading, which will help improve children's learning. In the same way Merchant (2015) notices that there are some comparisons between book- and iPad-sharing, such as physical proximity, however there are also some distinct differences that derive from the reading, adding that essentially the adult ends up becoming a provider of technical support.

Dunn and Sweeny (2018) state that the pencil has consistently remained to be the core instrument for writing, nevertheless considering how a number of children find it tiring and sometimes difficult to use a pencil, it could also be viewed as a possible hurdle for their literacy skills to advance in the progressively digitalised world that children are now living in. Therefore Dunn and Sweeny (2018) suggest that children can use digital media to overcome obstacles and barriers to learning, offering children alternative options that may not have been previously available. Donahue (2015) describes that just like a pencil, digital technology is a tool and knowing how to operate digital equipment is a significant part of becoming digitally competent, furthermore adding that current technology allows access to incredible amounts of material. McKenzie, Spence and Nicholas (2018) note that when digital devices are implemented correctly and appropriately within educational settings they can provide an inspiring, engaging and motivational environment for children to learn, along with opportunities to support literacy development, and creating positive outcomes. Likewise Nutbrown (2011) states that early years practitioners can use media to extend the curriculum in ways that appear more meaningful and relevant to children. As well as accessing digital media within education, Harrison and McTavish (2016) suggest that when some toddlers and infants partake in digital play within the home, it allows for them to improve their emerging literacy skills.

Marsh et al. (2018) states that many apps can facilitate imaginative thinking, exploration, participation, a sense of enjoyment and persistence and similar to Vygotsky's ethos, where Dolya (2009) states that Vygotsky understood real education as not just the acquisition of precise knowledge and expertise, but instead it is the growth of individuals' learning capabilities, inclusive of the ability to think concisely and imaginatively, plot and carry out their ideas and transfer their knowledge in a range of different ways. Dolya (2009) states that Vygotsky alleged this growth could be achieved by enabling them with a variety of social tools for thinking and creating. Erdogan et al. (2019) notes that in recent times play environments and resources have evolved,

and digital devices are becoming more readily available for young children. Fler (2018) recognises Vygotsky's importance of play in early years and discusses that digital animation and role play can enhance play opportunities for children, which consequently promotes involvement in play and improves social and cognitive expectations on children. Edwards (2013) states that more recent changes in play should not be viewed as a decline in quality, but instead be an adjustment to the evolving cultural setting, adding that consequently with knowledge gained, play appears to have altered. Erdogan et al. (2019) states that currently more traditional forms of play are still preferable across various countries, however it is vital to recognise that digital play may inevitably be more favourable in the future. Harrison and McTavish (2016) state that in today's modern world children are growing up where digital media is evolving and progressing at an extraordinary rate, and whilst many adults may find the change difficult to keep up with, children are coping well and seem to be at ease when using digital devices, even before learning to communicate. However Gelman et al. (2018) discusses the dangers of young children who willingly take risks with digital media, stating that young children are relatively trusting of people and do not always consider the consequences of revealing personal information online. Kaye (2017) states that both parents and practitioners need to be aware that there should be a balance supporting learning and development in the current digital age to foster children's natural inclination for play and discovery. Furthermore Kaye (2017) suggests that rapid developments in digital devices could see some skills that were previously taught within classrooms becoming obsolete in the future.

Section 2

Keeping children safe online

The internet can provide fun and interesting opportunities for your child, and it can be a great way for them to stay in touch with friends. However it is important to teach your child to stay safe online (Childline, no date).

What are the risks?

- Cyberbullying
- Overuse
- Grooming
- Illegal and offensive content

What can we do?

Tips for parents:

- Set boundaries from an early age, it is never too early to set time limits.
 - Keep your own devices out of reach from young children, such as mobile phones or laptops, set up passwords to restrict access.
 - Set parental controls on devices.
 - Check age ratings on apps before allowing your child to play them.
 - Remember - when using WIFI elsewhere that it may not include parental controls
- (Get safe online, 2019).



Age restrictions and social media

It is now a statutory requirement that all boxed games or games downloaded to a console have an age rating. These ages are 3+, 7+, 12+, 16+ and 18+ with details of the themes stated on the box. Legislation ensures that ratings are followed at the point of sale (NSPCC, 2018). Social media use can also be a healthy habit, it can encourage children to:

- Create friendships, have fun and develop relationships.
- Extend their offline face:face interactions.
- Share and discover educational content.

By exploring and experimenting with social media children can begin to learn how to use technology responsibly.

Occasionally children can be exposed to risks such as:

- Inappropriate content such as aggression, violent or sexual comments or images.
- Children may share personal information about themselves.
- Children could become bullied (Welsh Government, 2018).

If you are unsure of minimum ages for certain apps/games, check out <https://www.net-aware.org.uk/networks/> for a more thorough search.

Bing Images (2020)

Cyberbullying

If your child is being cyberbullied: There are steps that can be taken to help them:

- Reassure your child that the situation can be resolved.
- Ask your child to not reply, this will ensure the bullies are not receiving the attention they are looking for.
- Keep a written record, including emails, screen shots or texts.
- Use filters and tools to block out the bullies.
- Try not to deny your child the use of technology, but instead try to monitor their activity.

Throughout the UK it is an offence to send an electronic message that is offensive or indecent, under the Communications Act 2003 (internet matters, 2020; NSPCC, 2019).

Dreamstime (2020)



Vector stock (2020)



Supervise your child online

Educate your child about dangerous individuals that may be online. Discuss scams and viruses, whilst providing support or limited exposure to the risks.

Understand that your child may find the risks associated with online safety overwhelming, this could lead to them deciding against using social media entirely. Providing encouragement and positive feedback, whilst acknowledging their safe internet usage will help with their progress (Anonymous, 2012).

Be a good role model for children by setting a good example online. Regardless of the options for filters and parental controls, there is no better option than having honest and open conversations with your child (Open access government, 2019; thinkuknow, no date).

Set parental controls

Parental controls on devices:

Parental controls can be placed on your child's device, this will help filter out and block inappropriate content. Parental control also allows adults to:

- Set time restrictions on when your child can use their device, and how long they are able to use it.
- Ensure apps accessed by your child are age appropriate.
- Set personal profiles, that allow different individuals access to different content

(NSPCC, 2020).

Set online controls:

Setting online controls will allow search engines such as google and yahoo to eliminate inappropriate results, such as adult content like pornography. Advise your child to use *SafeSearch Kids* on google when surfing the internet (thinkuknow, no date).

Enable controls on social media and other websites:

social media and sites such as YouTube have privacy settings that can be altered to ensure children are accessing age appropriate content. However, it is important to be mindful that even with these filters in place it cannot prevent individuals sending offensive messages or comments directly to your child (thinkuknow, no date).

Encourage children to take a break from digital devices:

A lifestyle that balances screen time with offline activities, rather than revolving around it has to be healthier for everyone.

To create this balance try to:

- Plan activities that do not involve technology, create a good balance: one hour of technology use should equal one hour outdoors.
- Share your own experiences with your child from your childhood, play your favourite game.
- Find links from your child's digital habits, if they enjoy playing a football game online, then go outdoors and play football.
- Practice what you preach: if you encourage your child to turn off their device then you should do the same!

(Action for children, 2000; Welsh Government, 2019).

Get talking to your child:

Spend time talking to your child about the dangers of the digital world. Limiting certain online activities is not always the correct thing to do, instead parents/carers should try to portray:

- The importance of a person's digital reputation.
- Checking that what they are seeing online is factual.
- Good online safety and risk awareness.

Being supportive about your child's internet usage is important, encourage honest conversations surrounding online use. (Open access Government, 2019).

Take part in safer internet day:

Use the opportunity to have engaging conversations with your child about their digital habits, share tips and good practice with one another. More information and activity packs can be found at: <https://www.saferinternet.org.uk/safer-internet-day/safer-internet-day-2019/education-packs/activities-parents-and-carers>

(UK safer internet centre, 2020).



123RF (2020)

Create a family agreement:

Understanding the importance of positive family conversations regarding safe and responsible internet use, a great tool to agree clear and concise expectations and boundaries would be to create a family agreement that is created and signed by both children and parents/guardians (safer internet uk, 2020).

UK Safer internet centre (2019)

Section 3

Activity Plan		
Activity over view: Using Bee Bot within the construction area in the early year's classroom. Creating a path using the wooden blocks, then instructing bee bot to follow the path.		
Amount of children: 5 children.	Age of children: 4 and 5 years old.	Number of practitioners: 1
Where will the activity take place: Construction area within the classroom.	Preparation time: None required.	Duration of the activity: Child-led: for as long as the child is interested and engaged.
Resources required: Resources needed to undertake the activity would consist of: - Bee Bot. (practitioner to ensure batteries are charged within Bee Bot). - Construction materials: wooden blocks of varying lengths and different 3d shapes. - Pinecones.		
Practitioners role: - Encourage the children to take turns and share the Bee Bot. - Promote the use of coding language: forward, backward, left turn, right turn, pause, memory clear and start. - Model using the Bee Bot appropriately, reminding children of the 'clear' button, if the children require this support.		

- Allow the children autonomy of their own play and learning, if they choose to take a different direction with their play then the adult should support and encourage this.
- Allow enough time for children to experiment with the bee bot independently: testing the buttons and functions of the device, enabling them to understand what each button does.
- Encourage children to be confident in their own ability and remind the children not to be frightened to test the functions of Bee Bot.

The activity:

The activity will take place in the early year's classroom, within the construction area. Children will have access to wooden blocks of varying lengths, shapes and sizes. They will be encouraged to create a path with two sides for bee bot to move in-between and follow, in order to reach the end goal: the 'beehive' (the beehive will be pine cones children have sourced outdoors previously on a different day). Children will be encouraged to create a path that includes right turns and left turns. They will then take it in turns to control Bee Bot, navigating the route and experimenting with the functions of the device. They will be encouraged to keep trying, even if they send Bee Bot the wrong way in the first instance, this will allow children to have a basic understanding of Bee Bots functions. The adult will demonstrate how Bee Bot works, if the children need this example. The adult will also remind the children to press 'clear' in order to set new instructions for Bee Bot, if they become frustrated with the process. Children will have the opportunity to work with their peers to return Bee Bot to his hive. If the children create an alternative way to play with the Bee Bot, this will also be encouraged by the practitioner. The activity would exercise elements of the digital competence framework, including:

- ***Collaboration: work together with a partner/partners on a piece of digital work:***

The children would need to work with one another to share the Bee Bot and create a path for Bee Bot to follow.

- ***Problem solving and modelling: control devices by giving them instructions:***

The children will have the opportunity to experiment with Bee Bot, testing the functions of Bee Bot and what the buttons instruct the robot to do (Welsh Government, 2018).

Section 4

The activity consisted of children experimenting with Bee Bot to follow a path of blocks that they had created, within the construction area of a classroom. Bee Bot is described by Attard (2012) as a robot that allows children to sequence up to forty paces by using forward, backward, left and right turn arrows, stating that playing with Bee Bot allows children to engage in a problem-solving process. Brito, Dias and Oliveira (2018) notes that the adoption of smart toys has allowed for enhanced opportunities for both play and learning. Palaiologou (2014) discusses that there has been a change to early year's pedagogy in terms of how digital devices can contribute to learning, allowing it to be meaningful, adding that it can potentially contribute to children's home digital habits. Danby et al. (2018) notes that there is a place for digital devices within the modern classroom, stating that the association amongst young children's participation in digital games and literacy practices demonstrates that using these types of games are a rich resource for learning. Yelland (2018) states that digital devices should be used to extend and enhance learning, as opposed to just using a digital device for the reason of using technology. Jack and Higgins (2019) more recently notes that research demonstrates that technology is being used across the curriculum in open and experimental ways, supporting early years philosophy. This indicates the changes taking place and how educators are moving on from simply using technology during free play sessions, or to purely show children how to run devices. Donohue and Schomburg (2017) state that when used appropriately, as one of numerous devices to improve exploration and learning, technology offers wonder and pleasure to ordinary learning environments. Welsh Government (2018) discuss digital competency and the importance of early year's educators within settings to understand the value of digital learning for children within their care.

The activity allowed for children to experiment with early coding skills, Campbell and Walsh (2017) note that coding is become a progressively significant digital literacy practice that children should become proficient with. They discuss that play-based digital education is a good way to present coding and robotics into early education, where children have the option to immerse into a technology rich environment, where they can play and experiment. When specifically discussing

Bee Bot Campbell and Walsh (2017) note it is important for adults to use praise and reinforce positive feedback when children manage to make Bee Bot move from one place to the next, this will encourage the children to continue experimenting, Strader (2019) supports this, stating that praising effort over intelligence and talent is vital as it is more specific and focuses on overcoming difficulty and persevering, as opposed to intellect. Strader (2019) adds that this will in turn lead to promoting growth mindset. Boylon, Barblett and Knaus (2018) states that by developing children's growth mindset it enables them to implement independence within their own learning, supporting them to form optimistic learning habits, that will help them throughout their lives. Welsh Government (2018) discusses effective teaching and learning within the new successful futures curriculum as allowing individuals to take ownership over their own learning. Baroutsis et al. (2019) note that Bee bot allows children to test the accuracy of their programming skills and is a pre-cursor to other coding platforms. Murcia, Campbell and Aranda (2018) note that when children learn a programming language they are resolving difficulties in an efficient way learning new, powerful thoughts and conveying themselves with a range of computational media. Shui Ng (2017) notes that coding is a computer science, involving abstract concepts and can be difficult for young children, demonstrating that it is essential that adults within education explore relevant learning contents, adding that Bee Bot is a suitable tool to aid with young children learning coding.

Welsh Government (2018) discusses the new successful futures curriculum that is being applied throughout Wales and the emphasis it places on become digitally competent, stating that in order to be fully involved in modern society and the workplace the demand to be digitally skilled is already high, with the future looking to increase this demand. This demonstrates the need for children to experience and learn digital skills from an early age. I feel the activity linked well with the new successful futures curriculum. Bee Bot allows for use of the Digital Competency Framework to be exercised, the strand: Data and computational thinking, where the skill is problem solving and modelling, more specifically to 'control devices by giving them instructions' (Welsh Government, 2018). Welsh Government (2018) define one of the four purposes as 'ambitious, capable learners who are ready to learn throughout their lives', within this purpose is the skill to 'use digital technologies creatively to communicate, find and analyse information'. I feel the activity was an appropriate way of beginning to build these skills to be improved upon as the children grow. Eteokleous (2015) discusses the great potential of using digital devices such as

Bee Bot to achieve specific learning objectives as well as increasing knowledge and skills, demonstrating that Bee Bot could be used in various activities to meet a range of skills and abilities.

As the activity was child-led the children were allowed to construct their own play with Bee Bot and the building blocks, with the adult there to offer support when invited by the child, 5rights (2017) state that children using technology who are between ages 3-5 should be guided by an adult. De Haan and Sonck (2012) discuss how research shows that digital skills are largely gained at home, with this in mind, Livari et al. (2018) notes that it is the practitioner's duty to ensure they are decreasing inequalities between children who have varying digital competency skills, usually created by their socio-economic backgrounds and status. Without setting a specific outcome for the activity I felt it would allow for exploration for all children, including those who may not have much experience with digital devices, at a pace that is comfortable for the individual, allowing children of differing abilities to access the same activity as their peers. Dinc (2019) discusses one of the main barriers to integrating digital devices into the classroom as the practitioners own confidence in technology, with this in mind it is important that young children have the chance to explore and make mistakes, in order to build their confidence with digital technology. Schmitt et al. (2018) discusses that block play within the activity allows for preparation, problem solving and discussions with other pupils to take place, children have the opportunity to exercise these problem solving skills with both the block play and also navigating Bee Bot, cementing this knowledge further. Some children may have found it difficult to move Bee Bot, however, the main aim was for them to experiment with the device and begin to understand some of its functions, Merton (2018) states that providing opportunities that foster decision making, problem-solving and making choices will help build resilience in children, which will allow children to have a positive sense of self identity and confidence. The activity was planned with only using one Bee Bot, this would have required turn-taking and team work to take place Kumpulainen and Wray (2002) note that when children have the opportunity to work in collaborative peer groups it is believed to allow for children to create and raise awareness of their own thought processes, as it allows them opportunities to share their views and perspectives and find new ways to solve problems, by building on their peers contributions. This collaborative working would allow for peer learning to take place, Cicconi (2014) discusses Vygotsky's zone of proximal development theory, where children rely on a more knowledgeable other to enhance their learning, adding that this could be an adult or peer within the setting.

A draw back to the activity could be the cost of such digital tools, Brown (2016) state that in education many school rely on industry to fill the gaps relating to ICT within the curriculum, however this can become an issue when teachers have concerns that there is lack of training, time and resources input with digital training, also adding that lack of funding has become an issue for schools who are unable to purchase digital devices such as Bee Bot. Willis and Exley (2018) and Lynch and Redpath (2014) state that digital equipment is a potential tool that could be used to mediate a divide between home and schools, and also to encourage parental engagement. They add that this could then support cultural participation and learner identity for children within their setting. However more recently Gillen and Kucirkova (2018) states that evidence suggests that there are still many wasted chances for families and education to work closely to uphold effective practices with technology.

Moving forward I would allow children to access the Bee Bot within any area of the classroom as opposed to specific activities and set times, understanding now the cross-curricular opportunities this digital tool could provide. With digital devices being readily available within the setting it will hopefully enable children to experiment with the technology in their own time, when they feel ready to do so. Previously children within the setting would have been shown how to use an iPad, computer and Bee Bot for the sole reason of using a digital device, however now I have a deeper understanding I am aware that technology can be used in order to enhance other activities and resources, in different areas of learning.

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