Critical Approaches to Arts-based Research

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The UNESCO Observatory refereed e-journal is based within the Graduate School of Education at The University of Melbourne, Australia. The journal promotes multi-disciplinary research in the Arts and Education and arose out of a recognised need for knowledge sharing in the field. The publication of diverse arts and cultural experiences within a multi-disciplinary context informs the development of future initiatives in this expanding field. There are many instances where the arts work successfully in collaboration with formerly non-traditional partners such as the sciences and health care, and this peer-reviewed journal aims to publish examples of excellence.

Valuable contributions from international researchers are providing evidence of the impact of the arts on individuals, groups and organisations across all sectors of society. The UNESCO Observatory refereed e-journal is a clearing house of research which can be used to support advocacy processes; to improve practice; influence policy making, and benefit the integration of the arts in formal and non-formal educational systems across communities, regions and countries.

Critical Approaches to Arts-Based Research

Guest Editors Anne Harris
Mary Ann Hunter
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THEME

Arts based research (ABR), its products, processes and critical theorising have come a long way in recent times. Nuanced distinctions indicate the development of the field, as arts-informed research, arts-based research, practice-led research, applied research, and creative participatory action research all claim different relationships with the art and criticality present in such innovative scholarship. Finally, it seems, we are moving away from a defensive stance regarding arts based research and its 'validity', and toward a celebration of this proliferation of diverse ways of knowing, theorising and doing research. This 'coming of age' is evident in this special issue, which urges readers to move beyond binarised notions of scientific 'versus' arts based research that still at times dominates academic research environments and conversations, and outmoded practice/theory divides. For we co-editors and for the authors here, theorising is indeed a creative practice, and goes hand-in-hand with the epistemological and ontological potential of arts-making methods. This issue celebrates the opening of new doors in theorising innovative arts based research from a range of global contexts, theoretical and epistemological frameworks, and inter/disciplines. We avoid any attempt to codify or limit the parameters of what contemporary arts based research is or can be. Indeed, we seek the opposite: to highlight its ever-expanding possibilities.

The essays here aim to encourage critical analysis and dialogue about the objects and subjects of arts based research for contemporary times, poststructuralist, posthuman and other critical approaches to arts based research, and the interdisciplinary application of performative and practice-led research in transferable methodological models. We are pleased to be able to include digital assets with many of the articles in this special issue. Indeed, the layered and multimodal complexity of arts based 'outputs' or artefacts is one of its rich distinguishing features, and it requires commitment from editors and publishers to not always demand a 'reduction' back into text-based forms, a diminishment of many forms of ABR. For this we thank the UNESCO editorial and production team, and hope you enjoy this contribution to the critical development of the arts based research field.

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Seeing the world differently: Supporting autism spectrum expression and creativity through the use of technology in social spaces

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ABSTRACT

It has been said that the arts build upon our capacity for imagination and creativity, as well as for seeing things from different perspectives. However there appears to have been relatively little exploration of digital forms of expression in the field of arts based educational research (ABER), particularly as they relate to the creativity of individuals with perceived deficits in imagination and social cognition. Here we examine the creative potential of digital media practices popular with young people, including playing in multi-user 3D building environments such as Minecraft, gaming, and the creation of fan media. In particular, we look at the digital practices of young people diagnosed with autism who have perceived deficits in imagination and social cognition, yet produce singular expressions of creativity through that which sets them apart: their different ways of thinking.

Throughout this paper we refer to our intimate experiences with a project called *The Lab,* which promotes creative expression through social spaces where young people with high-functioning autism or Asperger's Syndrome meet peers with common technology interests and are mentored by IT professionals. We conclude by questioning deficit-based understandings of imagination and creativity in young people with autism, and propose that the digital traces generated by young people's computer-based creative activities can help ABER researchers to better understand young people's rich inner lives.

INTRODUCTION

In this paper we present a case for computers as catalysts for particular kinds of creative practice by a marginalised group of young people. We present the view that creative practice does not only occur in what might be deemed 'traditional' arts, but also through pursuits that are fundamentally digital: computer programming, the creation of simulated 3D objects, digital animation, collaboration via online social networking and the building of virtual environments in 3D multi-user platforms such as Minecraft. In particular, we restate the claim made by educational theorists with an interest in technology that some digital platforms offer possibilities for engagement that are different in type and character to other forms of the arts.

To do so, we draw on our intimate experiences of The Lab, an Australian network of technology clubs for young people with high-functioning autism or Asperger's Syndrome. We say intimate, because the authors of this chapter consist of a media academic and co-founder of The Lab, a parent with a son who attends a Lab, and an e-learning educator who has run a precursor to The Lab (a weekly technology club at a secondary school). We suggest that the very affordances provided by computer technologies are the key to their enthusiastic adoption by young people who have been diagnosed with autism, and whose brains are increasingly recognised as being wired differently to

'neurotypicals' (Nash 2002). In exploring this theme, we draw particular attention to the use of technology within social contexts, both in online and face-to-face settings. Participation in The Lab has enabled people on the high functioning end of the Autism Spectrum to 'find their voices' via computer-mediated forms of expression. These young people exist in a world that often rejects their attempts to engage with, or contribute to, 'neurotypical' society, due to their characteristic impairments in social interaction (Baron-Cohen 2008).

We propose that the judicious deployment of technology can not only provide social, therapeutic and educational benefits for young people with high-functioning autism (Donahoo & Steele 2013), but can also reveal unique forms of creativity. The digital artefacts generated promise to provide new insights into the inner lives and workings of a group of young people who can be mysterious even to close family, because they find traditional forms of communication too difficult or intense to deal with (Attwood 1998). As Elliot Eisner states in relation to ABER: "deeds, not words, may be in the end the most persuasive source of support and the source that yields the highest levels of credibility" (2008, p. 19).

TECHNOLOGY AND ABER: PARALLEL LIVES

The term arts based research came into being in 1993, the year that the World Wide Web emerged from the halls of universities with the invention of the Mosaic web browser. Although the creator of the term, Elliot Eisner, points out that "there is an intimate connection between technology and expressivity" (Barone & Eisner 2012, p. 5), arts based education research and digital technologies have led largely parallel existences during the intervening two decades. Indeed, a 2010 review of arts education by the Australian Council of Educational Research states that "Interdisciplinary experiences, including digital and

other emerging art forms, need to be deemed important, not marginal" (Ewing 2010, p. 55). However this review does not go on investigate the digital arts in detail, an inadvertent sign perhaps of the very marginalisation it highlights.

Today computers are routinely used in classrooms for media creation - video editing, image manipulation, audio composition, document production - online publishing and, increasingly, collaboration via platforms such as wikis, blogs and online media sharing sites. But although computers are widely deployed as tools for manipulating media, they are not always recognised as catalysts for creativity in their own right. Indeed, they are sometimes viewed with suspicion, a force to either ignore or fear: an inscrutable, alien 'other' imbued with arcane or metaphysical power (Marx 2010). Perhaps working with two-dimensional screens is considered somehow at odds with the embodied, tactile experiences associated with the arts. Perhaps too, the skills required to navigate the digital realm are to some degree poorly understood by, or even entirely foreign to, arts educators; these skills may range from the operation of graphics software packages and games to advanced programming. And perhaps, the much-discussed sense of a digital generational gap remains between those who have grown up with computers and those who haven't.

Certainly, the networked digital age is disruptive and unsettling. For one, it is transforming the way we make and consume media, with media makers now able to effortlessly find, copy, alter and share content. A hybrid of consumption and production has developed, which has been called produsage (Bruns 2007), and which challenges existing notions of ownership, control and original creation. We will explore an example later in our case study. Traditional notions of sociality are also being turned on their head faster than we can keep up. Technology simultaneously isolates and connects in new ways: the modern combination of bubble-like isolation and mediated sociality has been referred to by Turkle as being "alone together" (2011), and with the rise

and rise of mobile devices that never leave one's side, as creating a "tethered self" (2008). Digital devices increasingly form part of the core fabric of life for young people; the notion of digital technologies as separate or apart from daily life no longer exists for young people in the US (Madden et al. 2013). As Thomas (2006) states: "For children, there is no dichotomy of online and offline, or virtual and real; the digital is so much intertwined into their lives and psyche that the one is entirely enmeshed with the other" (Thomas 2006, p. 1).

This is perhaps even more the case for young people with autism. Burke et al. (2010) point out that because young people with autism find face-to-face contact difficult to negotiate, and because they are often hypersensitive to environmental stimuli (Markram et al. 2007), communication mediated by computers provides a safe option due to the 'social distance' it creates.

THE SOCIAL DIMENSION

In recent years, arts educators have increasingly viewed learning and changes in understanding and behaviour as essentially social events, facilitated by collaborative processes that are embedded in social and cultural practices, and where the learner 'constructs' meaning from the world around them (Connery et al. 2010). As Ewing (2010) states, "Relevant cultural tools and artefacts of a particular culture therefore mediate any learning" (p. 33).

This is particularly so for young people with autism spectrum conditions, for whom long-term interaction and learning in groups has been found to be the most effective support. Martinovich (2006) writes: "Perhaps the greatest need for the adolescent is to make meaningful connections with other people, to feel they have something meaningful to offer and have skills to make positive choices about their future" (p. 13).

Educators with a constructivist orientation have long recognised the role of technology in this social process of learning, even before the advent of what has been called 'social media' (Allen 2004), or perhaps more fittingly, Judith Donath's term 'sociable media' (2004), defined as "media that enhance communication and the formation of social ties among people" (p. 1). A large body of educational literature focuses on the development of constructivist technology-based interventions and strategies. Kearsley and Shneiderman (1999) assert that technology can facilitate learning in ways difficult to achieve otherwise, elaborating this into a conceptual framework they call Engagement Theory. Others expand on Vygotsky's theory of the Zone of Proximal Development and its focus on activities that are non-controlling, optimally challenging, and that transfer the locus of control to the learner (Sivan, 1986). Papert's (1980) constructivism-inspired notion of 'Constructionism' discusses the use of computers for learning, including ideas about knowledge construction through the physical building of an object, model or game. This in turn has inspired Mitch Resnick, the developer of the 'Scratch' programming language and founder of the 'Computer Clubhouse' network of drop-in technology centres for underserved young people, one of the operational models for The Lab. More recently, media theorist Henry Jenkins (2006) has outlined the potential of technology-driven 'participatory cultures' for civic engagement and creative expression.

AUTISM, SOCIALITY AND CREATIVITY

Autism Spectrum conditions are generally understood to consist of difficulties in perceiving social and communicative aspects of everyday interactions and environments, and implicit meaning in written or spoken language (Baron-Cohen 2008). Many people on the spectrum also experience differences in ascribing mental states, intentions and feelings and thoughts to

other people and things, as well as differences in sensory and perceptual experiences of the world around them, such as the intensity of their responses to sounds, light, smells, colours, textures or tastes (Bogdashina 2003).

Much of the research into autism and children has tended to focus on the difficulties experienced in social development. This has resulted in the generation of a wide range of approaches focusing on scaffolding social experience so that young people can learn from otherwise missed critical developmental stages.

Some experimental research has also focused on perceived deficits in imagination and creativity. Indeed, a lack of 'normal' creativity has been one of the diagnostic symptoms of autism (APA 2000). One of the first such studies that sought to demonstrate evidence of imagination and creativity deficits among children with AS conditions was published by Craig & Baron-Cohen (1999). They concluded that creativity in autism tends to be reality-based, rather than imaginative: participants perform better in tasks based on rules or real world observations compared with tasks requiring pretence in which non-real or fantasy-based responses are acceptable.

In contrast, Liu et al (2011) investigated creativity in autism from an opposing direction. This was based primarily on a report that one in ten people with autism show some savant skills in various areas (Treffert 2009), as well as associations between autism and a variety of talents and aptitudes made by previous researchers (e.g. Gillberg 2002). Mottron, Dawson and Soulieres (2009) suggest that autism involves "an entirely different processing system, rather than as a collection of negative cascade effects resulting from one or many major impairments" (p.1385). This dovetails with a general tendency by education scholars such as Egan (2007) to see 'thinking differently' in positive rather than deficit terms. Interestingly, some years after undertaking a study of savantism in the arts and undertaking further observation, Treffert (2009) reversed his original thesis that savants were

remarkably talented in areas such as replication but lacked creativity. Liu et al's study reported that children with autism scored higher than neurotypical peers in the areas of elaboration and originality, but lower in the areas of openness and flexibility: in other words, they were more creative within the areas of their special interests. The authors concluded: "Considering that a crucial part of creativity is a deep love for and enjoyment of the tasks undertaken (Torrance 1995), children with AS have an advantage. However, in order to go further than repetition, opportunities to develop expertise in their absorbed subjects may need to be provided" (p. 298).

A child's development of remarkable expertise in their special interests is a characteristic feature of high functioning autism (Assouline et al. 2009; Attwood, 2003; Carrington & Graham 1999). Combined with their (by definition) average or higher IQ and concomitant weaknesses in other areas such as social skills and fine motor coordination, they can be identified as gifted, according to definitions of giftedness by Gardner (2000b) and others. Baum et al. (1989) found that when gifted children on the autism spectrum were allowed to learn in domains other than the predominant linguistic mode of schooling, they were highly motivated and successful. Those channelled into traditional learning support or special needs programs were not so fortunate (Norris & Dixon 2011). Unfortunately, these children are usually identified by their disability and not by their gifts (Davis & Rimm 1998; Lovecky 2004).

The first large-scale Australian study to describe the life experiences, aspirations and support needs of adults with high-functioning autism (Autism Spectrum Australia 2012) highlights that "educational experiences for people in this group are characterised by social isolation, failure to meet learning support needs, and harassment and bullying which results in years of struggle with ongoing mental health issues."

Before personal computers became accessible to virtually all, many young people on the autism spectrum sought refuge and developed distinctive abilities in a narrow range of activities or interests such as drawing, calculating and mechanical skills. Then (as now) they displayed the ability to construct complex models or structures with great accuracy and perform map making and direction finding with great mastery (Cardinal 2009). These days, such 'special interest areas' tend to be closely tied to computers and their use (Putnam & Chong 2008).

In terms of social development and autism, many researchers have explored the ways in which young people with autism might develop their social skills through forms of socially-based interventions (Portman & Semrud-Clikeman 2012; Baron-Cohen 2007, 2008). However until The Lab, there had been few opportunities created for autistic young people to combine their social and technological interests in relaxed and accepting settings. Here, it appears that LAN cafés - commercially-run spaces where people gather to play computer games - have long taken up the role of providing havens for all kinds of gamers and 'geeks'. These cafés are techies' versions of what Oldenburg (1989) called the 'third place', providing "liminal spaces situated at the margins of…culture and located at the junctions between home, school and the street, online and offline spaces, work and play" (Beavis et al. 2005, p. 1).

In such places and in the context of their specific interest, Attwood (2003b) believes that high-functioning autistic people may demonstrate strengths in social, communication and emotional skills. In a LAN café or technology club, for example, participants are valued for what they bring to the group and are not judged on their social rank outside it. Here, their shared interests and ability to 'talk tech' may reduce or dispel the social awkwardness and isolation they experience in mainstream school or public settings, with a corresponding effect on their anxiety levels.

These and other factors appear to combine to allow people on the autism spectrum to be at their best socially, productively and creatively.

ABOUT THE LAB

It is in this context that we introduce The Lab in more detail. The Lab concept is relatively simple, consisting of an internet-connected interaction space for young people aged 10 to 16 with high-functioning autism or Asperger's Syndrome who like computers, with a separate space for parents and carers to meet. Weekly two-hour Lab sessions are held at donated partner spaces after school or on weekends. Two software developers or designers work as mentors for between twelve and 20 young people, who bring their own laptops.

Since its founding in early 2011, The Lab has evolved into a growing network, with (currently) eight Labs around Australia catering to 150 young people and their families. Each Lab is different in context and character: some are based at donated company offices, some in community centres, one in a Returned Services Leagues club, and one in a LAN café.

Activities and technologies at each Lab vary, and are based on participants' interests. A typical Lab session may see participants setting up and running Minecraft servers, creating computer games, learning programming, building websites, designing comic strips or experimenting with Arduino hardware kits. The Lab is deliberately unlike school: structured group activities are limited to 'maker' competitions and a suite of 34 permanently available online programming lessons (see: www.thelab.org.au/lessons). The Lab aims to be more like a club where young people can unwind after an (often difficult) school day, meet one another, play games, swap information or learn new skills: it recognises that creativity is a social process existing not only

in the individual, but through interaction with others (Sawyer 2006). To put it in activity theory terms, the Lab is, like LAN cafés, a form of a 'third place' that plays host to what Engeström (2001), elaborating on Vygotsky's theories, calls 'interacting activity systems', involving participants, families, mentors, Lab staff and a smorgasbord of technologies (Rizzo, Schutt & Linegar 2012).

At The Lab participants may choose to work alone, but can also move around freely with their laptops and sit with others without restrictions or obstructions. Some choose to share their screens with others, whereas others are intensely private: this level of control is important. In a 2011 interview for a video about The Lab, co-founder Dale Linegar summarises the essential elements as:

> *open spaces for easy interaction where everybody can see everybody else's monitor, chairs sliding across floors, easy access to peers who are not only technically capable but also young enough to understand the culture of the lab participants for a quick question, facilitators 'hovering', no parents, a local network kids can connect through, no set or forced lessons.*

In a post to the Lab's private research data blog, Linegar outlines the reason for this non-controlling and flexible approach: "It's hard to know what they are actually interested in, so you can't plan - all you can do is follow your nose a bit based on what they are showing you." Mentors and participants engage in a process of negotiation, working together to obtain a goal that is understood as important by both. As several parents have noted in a recent evaluation of The Lab (Donahoo & Steele 2013), it creates the opportunity for children to form comfortable peer groups and to gather in a social system, something that they tend not to experience elsewhere.

At the time of writing, the multi-user building game Minecraft has proven particularly popular with many younger

Lab participants, illustrating the opportunities offered by technology to engage young people with autism in creative and unique ways. Minecraft (http://www.minecraft.net/) allows users to build constructions out of textured cubes in a 3D world and shelters in a fixed grid pattern representing materials such as dirt, stone, various ores, water, and tree trunks. The primary goal is to survive attacks by monsters, and users create their own (often elaborate) environments that can be traversed - and altered or destroyed, depending on the server permissions - by themselves and others. Users can set up their own local Minecraft servers, create elaborate worlds in their Minecraft server or others', and invite others to join them. It appears that this combination of control, demonstration of creative and technical skill and mediated sociality has proven highly attractive for participants, and offers promising possibilities for future research. To date we have seen Minecraft host the development of new friendships, the negotiation of power relationships, the learning of practical skills (e.g. 3D building, setting up and managing local servers) and much jointly directed collaborative activity. Some screenshots of Lab-generated Minecraft environments follow:

Indeed, educators around the world are recognising the platform's potential. Minecraft environments customised for educational use have begun to appear, such as the Massively Minecraft environment (http://massively.jokaydia.com/) created by Australian technology educator Jo Kay, and MinecraftEd' (http://minecraftedu.com), a collaboration between educators and programmers from the United States and Finland, and Swedish Minecraft creators Mojang. Of particular note is Autcraft (http://www.autcraft.com/), a recently established Minecraft server for young people with autism by a US-based father of an autistic child.

Next, we present a case study that outlines some of that ways that a participant's creativity and skills have been fostered by the Lab environment.

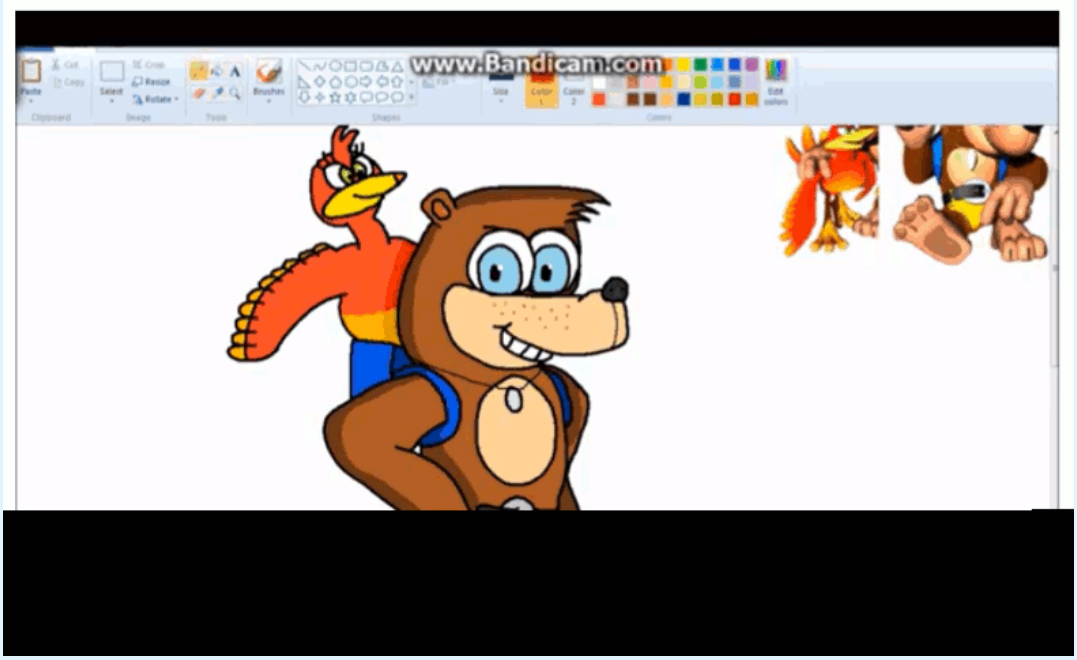
'WILLIAM': A CASE STUDY OF A LAB PARTICIPANT

> *I think his confidence has definitely grown. He now realises that things he might have thought of as difficult or hard, he can achieve those things if he works at them. His passion has definitely grown as a result.*
>
> *William's mother, video interview, 2011*

'William' is 13 years old and has been a participant in The Lab since 2011. He has a longstanding and exclusive interest in the computer game Super Mario Brothers. This special interest has been at the core of William's creative activities, which include music, graphics, video making and programming. William often comes to Lab sessions in his favourite Super Mario hat and t-shirt. William plays the piano and started lessons approximately a year before he joined The Lab. After joining, William became interested in making his own Super Mario games, including creating his own soundtracks. His parents supported his musical interest by buying books of piano sheet music that included the soundtrack for the game Mario Brothers and the Legend of Zelda. Since then, William has amassed a collection of gaming music CDs and gaming and animation books. In early 2013, William began violin as part of his Year Seven music class. He spent much time practicing so he could teach himself the music to Mario Brothers and the Legend of Zelda.

The Lab has another long-standing participant, 'Adam', who is highly adept at drawing, comic making and video creation. Adam has his own YouTube channel that receives thousands of

views. William and Adam have become friends through The Lab. William has been greatly inspired by Adam's artwork, as well as the artwork in Super Mario games. This inspired William to undertake an art course in 2012. Since then William has created a number of "speed draw" animated video clips on his YouTube channel, which use time-lapse video tools to demonstrate William's prowess in drawing Mario-related characters using standard free drawing and graphics programs such as Microsoft Paint. Some of these video have also received thousands of page views:



William's YouTube channel also includes a range of other videos, including animations with voice-overs and soundtracks, animation tutorials and tips for Minecraft, which William also spends time playing at The Lab. William has received a number of encouraging comments from other users around the world, including Adam, who is a subscriber to William's channel. An example of a comment follows:

Your videos are amazing and awesome! keep up the good work! you deserve way more than just 23 subs (including me) ill try to shout out your channel when i can! Jeep on drawing bro from your artist online friend, W ;D

It should also be noted that we have read only positive and encouraging comments in William's YouTube channel.

William has also used the web graphics program Fireworks to create alternative Super Mario logos and versions of Wii game covers, which he has posted to the Lab blog:

Lastly, in the previous year William has been busy programming his own Super Mario computer games using the Game Maker program. He is currently creating his third game, and is developing advanced coding skills.

William's ongoing digital adventures reveal his engagement with the popular creative 'produsage' practice known as 'fan fiction' or 'fanon' (McCardle 2003). These practices are a creative response to a culture of consumption: in Henry Jenkins' words, they are part of the public desire of fan communities "to participate within, rather than consume, media" (2006b, p. 150).

Through the tools available in the digital realm - from programs like Game Maker or MS Paint to distribution mechanisms like Tumblr or YouTube - fans of original content (the canon, or source) make and post their own content. When this happens

en masse, the distinction between the canon and fanon becomes blurred, with fanon (fan contributions) influencing the development of the canon (the source material). When this happens, the fan content is known in online circles as 'ascended fanon' (Vasicek 2013).

William's works indicate an active involvement with worldwide online networks of creator communities and their emergent practices - connections and practices that are not always known or understood by others who may dismiss works like William's as derivative or unimaginative. To the contrary, we believe they point to a sophisticated understanding of the online ecosystem: a complex web of information gathering/processing and interaction undertaken using a variety of platforms, incorporating informal systems of peer tuition and support. A 13 year-old child with autism like William or Adam may sit quietly alone looking at a screen, yet be immersed in a secret and expansive world that is both rich and rewarding for him and the others with whom he engages online. Artefacts such as the ones above provide the rest of us with some clues about these secret lives. Further, they demonstrate how catalysts in supportive social contexts can help spur young people with autism to discover new forms of expression and develop new skills.

But not only those with an artistic bent are served by the possibilities of the digital age. Whereas William and others at The Lab are naturally adept at drawing and other artistic practices, there are those who, due to problems with fine motor skills, have never found the arts 'within their grasp'. One can imagine the frustration felt by the 'visual thinkers' among this latter group: Grandin (2010) proposes there are three different types of specialised minds: music and math thinkers; verbal logic thinkers; and visual thinkers. While some may lack the motor skills to write, paint or sculpt, they may be adept at using a mouse and keyboard. For some, using computer graphics and coding programs are the only ways to produce representations

- *in pictures* - of their way of thinking. For example, several Lab participants with poor fine motor skills can somehow use specialised gaming mice with up to 17 buttons with remarkable dexterity.

CONCLUSION

This paper discusses the use of computers for creative learning and research through the example of a technology program for young people with autism. We believe there are useful things to be learned from the experience of The Lab, not just for those working in autism, but also for arts educators working with young people in general.

The first point here is a general and perhaps obvious observation that it is often better to focus on capacities and passions instead of perceived deficits. As Treffert states of people with autism, it is better to "train the talent! And as one does so, some of the 'defect' subsides" (2009, p. 1355). And as many parents know, those with autism are not the only young people passionate about technology, either for its own sake or as a tool to achieve specific ends: interaction with others, the development of specific interests and skills, or, like William and Adam, both in tandem.

To allow these capacities to emerge, the example of The Lab reminds us that the setting can make a tangible difference. In the case of The Lab, this has been in a form that, to again cite Sivan (1986), is non-controlling, optimally challenging, and that transfers the locus of control to the learner.

Our second point relates to the place of technology in ABER. We believe that coding, gaming, the creation of fan media and other digital pursuits can be as creative as non-digital painting, music or drama, and a useful complement and catalyst to these

pursuits. For some young people, digitally-based activities align closely with their existing everyday practices, which may make the task of engagement easier, especially for those who prefer social connection to be mediated in some form (such as is the case for many with autism). However, some of these digital practices still appear to be under-explored in arts education.

Thirdly, we believe that as objects of study, the range of digital traces generated as end products (and/or by-products) of young people's technology endeavours offer important research insights into their inner lives and the lives of those with whom they interact. These traces may be generated as part of specific interventions (such as The Lab), or as part of young people's existing everyday practices. They illustrate the point made by Black (2011) about arts based methods' ability to,

> *incorporate practice, process, and product all at once...arts based methods can reveal tacit knowledge and make knowledge and meaning construction visible. They offer representational forms and products to communicate stories of experience and to support reflection and action (p. 67).*

The embodied richness of these traces promises to generate new kinds of knowledge about the intricate lives lived by young people in the digital age - lives that are not always apparent at first glance to those who don't live inside those digital worlds themselves. And so we end with Barone and Eisner's inspiring words about the aim of ABER, which seems to us to align closely with the themes of this paper:

> *...the contribution of arts based research is not that it leads to claims in propositional form about states of affairs but that it addresses complex and often subtle interactions and that it provides an image of those interactions in ways that make them noticeable. In a sense, arts based research is a heuristic through which we deepen and make more complex our understanding of some aspect of the world (2012, p. 3).*

REFERENCES

Allen C 2004, 'Tracing the Evolution of Social Software', *Life with Alacrity* blog, viewed 19 September 2014, http://www.lifewithalacrity.com/2004/10/tracing_the_evo.html

American Psychiatric Association (APA) 2000, *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition (text revised), APA, Washington DC

Assouline, SG, Foley Nicpon, M, Colangelo, N & O'Brien, M 2008, *The paradox of giftedness and autism: Packet of information for professionals (PIP),* University of Iowa, The Connie Belin & Jacqueline N. Blank International Center for Gifted Education and Talent Development, Iowa City

Attwood, T 1998, *Asperger's Syndrome: A Guide for Parents and Professionals*, Jessica Kingley Publications, London

Attwood, T 2003, 'Understanding and managing circumscribed interests', in M Prior (ed.), *Learning and Behavior Problems in Asperger Syndrome,* The Guilford Press, New York, pp.126-147.

Attwood, T 2003b, 'Is There a Difference Between Asperger's Syndrome and High-Functioning Autism?', *Tony Attwood* website, viewed 19 September 2014, http://www.tonyattwood.com.au/index.php/publications/by-tony-attwood/new-resource-papers/69-is-there-a-difference-between-aspergers-syndrome-and-high-functioning-autism

Autism Spectrum Australia – Aspect 2012, 'We Belong: Investigating the experiences, aspirations and needs of adults with Asperger's disorder and high functioning autism', *Autism Spectrum Australia* website, viewed 19 September 2014, http://autismspectrum.org.au/images/Final_We_Belong.pdf

Baron-Cohen, S 2007, 'Theories of the autistic mind', *The Psychologist*, vol. 25, no. 2, pp. 112-116.

Baron-Cohen, S 2008, *Autism and Asperger Syndrome: The Facts*, OUP, Oxford

Barone, T & Eisner, E 2012, *Arts Based Research*, Sage Publications, New York

Baum, S, Emerick, LJ, Herman, GN & Dixon, J 1989, 'Identification, programs and enrichment strategies for gifted learning disabled youth', *Roeper Review*, vol. 12, no. 1, pp. 48-53.

Beavis, C, Nixon, H & Atkinson, S 2005, 'LAN cafes: cafes, places of gathering, or sites of informal teaching and learning?' *Education, Communication and Information*, vol. 5, no. 1, pp. 41-60.

Black, A 2011, 'Making meaning with narrative shapes: what arts based research methods offer educational practitioners and researchers', *Studies in Learning, Evaluation, Innovation and Development*, vol. 8, no. 2, pp. 67–82.

Bogdashina, OBG 2003, *Sensory perceptual issues in autism and asperger syndrome: different sensory experiences - different perceptual worlds*, Jessica Kingsley, London

Bruns, A 2007, 'Produsage: Towards a Broader Framework for User-Led Content Creation', *Proceedings of the 6th ACM SIGCHI conference on Creativity & Cognition*, ACM, Washington, DC

Cardinal, R 2009, 'Outsider Art and the autistic creator', *Philosophical Transactions of the Royal Society*, vol. 364, no. 1522, pp. 1459-1466.

Carrington, S & Graham, L 1999, 'Asperger's Syndrome: Learner characteristics and teaching strategies', *Special Education Perspectives*, vol. 8, no. 2, pp. 15-23.

Connery, M, John-Steiner, V, Marjanovic-Shane, A 2010, *Vygotsky and creativity: a cultural-historical approach to play, meaning making, and the arts*, Peter Lang Publishing, New York

Craig, J & Baron-Cohen, S 1999, 'Creativity and imagination in autism and Asperger syndrome', *Journal of Autism and Developmental Disorders*, no. 29, pp. 319-326

Davis, GA & Rimm, SB 1998, *Education of the Gifted and Talented*, Allyn and Bacon, Boston

Donahoo, D & Steele, E 2013, 'Evaluation of The Lab: A technology club for young people with Asperger's Syndrome', *Young and Well Cooperative Research Centre* website, viewed 19 September 2014, Young and Well Cooperative Research Centre, Melbourne, http://www.youngandwellcrc.org.au/wp-content/uploads/2014/03/Evaluation_Report_The_Lab_Final_240913.pdf

Donath, J 2004, 'Sociable Media', in WS Bainbridge (ed.), *The Encyclopedia of Human-Computer Interaction*, Berkshire Publishing Group, Great Barrington, MA, pp. 627-633

Egan, K 2014, 'A brief guide to imaginative education', *Imagination in Education Research Group (IERG)*, viewed 19 September 2014, http://ierg.ca/about-us/a-brief-guide-to-imaginative-education/

Eisner, E 2008, 'Persistent tensions in arts based research', in M Cahnmann-Taylor & R. Siegesmund (eds.), *Arts based research in education: Foundations for practice*, Routledge, New York

Engeström, Y 2001, 'Expansive Learning at Work: toward an activity theoretical reconceptualization', *Journal of Education and Work*, vol. 14, no. 1, pp. 133-156

Ewing, R 2010, *The Arts and Australian Education: Realising potential*, ACER Press, Melbourne

Grandin, T 2010, 'Autism - The Way I See It: Different Types of Thinking in Autism', *Temple Grandin* website, viewed 19 September 2014, http://www.templegrandin.com/article.html

Gillberg, C 2002, *A guide to Asperger's syndrome*, Cambridge University Press, Cambridge

Jenkins, H, Puroshotma, R, Clinton, K, Weigel, M & Robison, AJ 2006, *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*, viewed 19 September 2014, John D. and Catherine T. MacArthur Foundation, http://www.newmedialiteracies.org/wp-content/uploads/pdfs/NMLWhitePaper.pdf

Jenkins, H 2006, *Fans, Bloggers, and Gamers: Exploring Participatory Culture*, NYU Press, New York

Jordan, R & Libby, S 1997, 'Developing and using play in the curriculum', in S Powell & R Jordan (eds.), *Autism and Learning: a Guide to Good Practice*, David Fulton, London, pp. 118-157

Kearsley, G & Shneiderman, B 1999, 'Engagement Theory: A Framework for Technology based Teaching and Learning', *Educational Technology*, vol. 38, no. 5, pp. 20-23

Liu, M.-J, Shih, W-L, Ma, L-Y 2011, 'Are children with Asperger syndrome creative in divergent thinking and feeling? A brief report', *Research in Autism Spectrum Disorders*, vol. 5, no. 1, pp. 294-298.

Lovecky, DV, 2004, *Different minds: Gifted children with AD/HD, Asperger syndrome, and other learning deficit*s, Jessica Kingsley Publishers, London

Madden, M, Lenhart, A, Duggen, M, Cortesi, S, Gasser, U 2013, 'Teens and Technology 2013', *Pew Internet & American Life Project*, viewed 19 September 2014, http://www.pewinternet.org/Reports/2013/Teens-and-Tech.aspx

Markauskaite, L 2011, *Methodological choices and research designs for educational and social change: Linking scholarship, policy and practice*, Springer, Dordrecht

Markram, H, Rinaldi, R & Markram, K 2007, 'The Intense World Syndrome – an Alternative Hypothesis for Autism', *Frontiers in Neuroscience*, vol. 1, no. 1, pp. 77–96.

Martinovich, J 2006, *Creative Expressive Activities and Asperger's Syndrome: Social and Emotional Skills and Positive Life Goals for Adolescents and Young Adults*, Jessica Kingsley Publishers, London

Marx, L 2010, 'Technology: The Emergence of a Hazardous Concept', *Technology and Culture*, vol. 51, no. 3, pp. 561-577.

McCardle, M 2003, 'Fan Fiction, Fandom, and Fanfare: What's All the Fuss', *Boston University Journal of Science and Technology*, vol. 9, no. 2, pp. 433-458.

Nash, MJ 2002, 'The Secrets of Autism', *Time*, vol. 159, no. 18, pp. 46-57.

Mottron, L, Dawson, M, & Soulieres, I 2009, 'Enhanced perception in savant syndrome: patterns, structure and creativity', *Philosophical Transactions of the Royal Society*, vol. 364, no. 1522, pp. 1385-1391

Oldenburg, R 1989, *The Great Good Place: Cafes, Coffee Shops, Community Centers, Beauty Parlors, General Stores, Bars, Hangouts, and How They Get You Through the Day*, Paragon House, New York

Portman, M & Semrud-Clikeman, M 2012, 'A social competence intervention for young children with high functioning autism and Asperger syndrome: a pilot study', *Autism*, vol. 16, no. 6, pp. 586-602.

Putnam, C & Chong, L 2008, 'Software and technologies designed for people with autism: What do users want?'*Proceedings 10th International ACM SIGACCESS conference on computers and accessibility*, ACM, New York, pp. 3–8.

Rizzo, A, Schutt, S & Linegar, D 2012, 'Imagine That: creating a 'third space' for young people with High Functioning Autism through the use of technology in a social setting', *Proceedings of the 24th Australian Computer-Human Interaction Conference*, pp. 513-516

Sinner, A, Leggo, C, Irwin, RL, Gouzouasis, P & Grauer, K 2006, 'Arts based educational research dissertations: Reviewing the practices of new scholars', *Canadian Journal of Education*, vol. 29, no. 4, pp. 1223-1270.

Sivan, E 1986, 'Motivation in social constructivist theory', *Educational Psychologist*, vol. 21, no. 3, pp. 209–233.

Thomas, A 2006, '"MSN Was the Next Big Thing after Beanie Babies": children's virtual experiences as an interface to their identities and their everyday lives', *E-Learning*, vol. 3, no. 2, pp. 126-142

Treffert, D 2009, 'The savant syndrome: an extraordinary condition. A synopsis: past, present, future', *Philosophical Transactions of the Royal Society*, vol. 364, no. 1522, pp. 1351-1357.

Turkle, S 2008, 'Always-On/Always-On-You: The Tethered Self', in JE Katz (ed.), *Handbook of Mobile Communication Studies*, MIT Press, Cambridge, MA

Turkle, S 2011, *Alone Together: Why we expect more from technology and less from each other*, Basic Books, New York

Vasicek, J 2013, 'Trope Tuesday: Schrödinger's Gun, One Thousand and One Parsecs', *One Lower Light* website, viewed 19 September 2014, http://www.onelowerlight.com/writing/?p=8622

Vygotsky, LS 1978, *Mind in Society: The Development of Higher Psychological Processes*, Harvard University Press, Cambridge MA