

THEATRE OF THE IMAGINATION

EXPLORING A PEDAGOGIC TOOLKIT FOR CREATIVE
DEVELOPMENT AND GLOBAL LEARNING IN PRIMARY
EDUCATION

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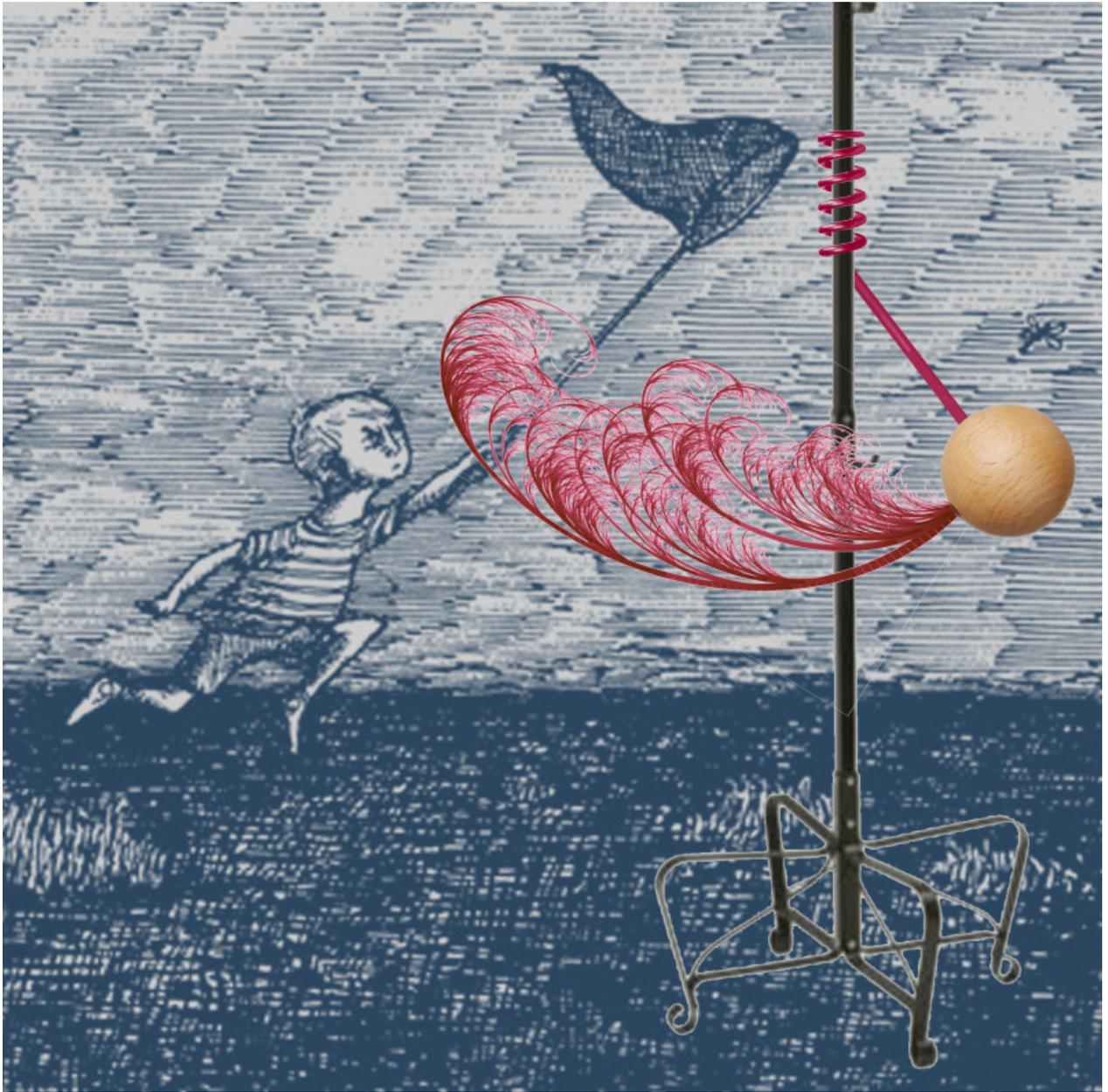
Abstract

'Theatre of the Imagination' sets out to explore how creative practice may help nurture personal agency and global citizenship in mainstream primary education. Signature pedagogies from art and design are transferred through a series of workshops created to foster design thinking and to cultivate haptic skills. The approach is constructivist in nature and encourages participants to depict lived experiences and generate imaginative ideas by articulating tacit knowledge through drawing, making and storytelling.

Transition design provides a framework for social transformation as it encourages activists to construct a vision of what might be possible in the future and to plan small interventions aimed at bringing about change. Theories of change link transition design to the efforts being made in primary schools to nurture responsible stewardship. I have adopted selected UN global goals to raise awareness of diversity and to help foster learners as socially aware, global citizens. Nurturing empathy and a 'care-full' attitude to others contributes to the constructivist epistemology and to a value-laden axiology.

The workshops set out to develop and test a series of creative tools through participatory action research aimed at accelerating learning in mainstream primary education. They are designed to foster personal agency through metacognition, creative ideas through practice, and engagement with global learning through discussion and storytelling. A series of constructivist learning design events produce compelling insights that suggest art and design in mainstream primary education has the potential to make a high impact on the development of cognitive and non-cognitive skills. These findings contest outcomes from the government-funded Education Endowment Foundation (EEF) research and require further investigation at a time when mainstream arts education is under duress.

KEYWORDS: primary education; personal agency; metacognition; creative practice; global goals; transition design; constructivist learning design; participatory action research



Kinetic Aesthetic (Pulley, 2014)

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- 2) 'Theatre of the Imagination': Workshop at UCA Farnham (Hylton and Pulley, 2014)
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1.0 Introduction

My research question in 'Theatre of the Imagination' is: **'How can creative practice help nurture personal agency and global citizenship in mainstream primary education?'** The aims of the research enquiry are to:

- develop the agency of children in primary education through co-designing;
- enhance metacognitive skills through creative thinking and practice;
- foster empathy by raising awareness of the UN global goals;
- apply design and making as a method to help change the perceptions of children.

I intend to involve mainstream primary children in creative workshops related to the environment and society, and to gather qualitative evidence through practice.

1.1 Motivation

Mainstream primary education is under duress because of funding cuts, a shortage of teachers, and the imposition of a curriculum structure and content which government advisors and teachers' unions accept are flawed (Boffey, 2015). The new curriculum overlooked priorities emerging from seminal research undertaken by the Cambridge Primary Review Trust. Alexander et al. (2009) stressed the importance of taking the curriculum seriously beyond 'the three Rs' (Timbs and Limbird, 1825, p.85) while recognising that schools must also insist on the necessity of literacy and numeracy.

Creative skills have the potential to nurture self-regulated learning and self-efficacy in mainstream education, characteristics of metacognition which help to develop confidence and greater equality of opportunity with peers from more economically privileged backgrounds (Burkitt, 2015). According to Burkitt, mainstream primary schools find it difficult to match specialist schools in teaching creative arts practice. This is, in part, due to the relatively low number of hours dedicated to developing creative skills in teacher education and limited opportunities for professional development in an increasingly marginalised area of the curriculum. The discrepancy is also due to the fact that national tests are compulsory in mainstream schools but are not in private schools where less time is spent on preparing children for tests.

Art and design interventions in primary schools have a rich history and tradition. 'Theatre of the Imagination' calls upon the work of seminal educators such as Malaguzzi's Reggio Emilia primary school movement in Italy (**Appendix Eight: Figure A8.10, p.270**). Malaguzzi was influenced by the work of Dewey (1938) and they both believed that learning and play are not separate activities and that children can form an understanding of their place in the world through interaction with others.

More recently, Thompson and Hall (2012) defined art and design pedagogy as: "... the shaping of the learning environment as a whole, in classroom settings, and more widely in the school and community." Their research is concerned to explore the differences between arts-related signature pedagogies, and the 'default pedagogy' established in schools by a standards agenda that defines excellence in terms of progress against a limited set of measurable indicators.

I have collaborated on art and design interventions in schools in the UK and overseas for more than twenty years. My work includes a project with Professor Ajanta Sen and Professor Ravi Poovaiah, researchers based at the Indian Institute of Technology in Mumbai (IITB). Sen (2009) helped to connect primary schools in Falmouth to primary schools in Mumbai, through a programme of arts activities which addressed a lack of cultural and ethnic diversity in Cornish primary education (**Appendix one: p.189**). I collaborated with IITB again in 2017 to test the effectiveness of my new creative toolkit. I adapted the Winterhouse Matrix (Irwin, 2015) to demonstrate how incremental steps enable projects to be scaled up to foster co-designing between actors from local communities across geographic space (**Appendix 4: p.236**).

While art and design interventions in primary schools have a rich history, few have developed a creative toolkit to support translocated practice (Hall, 2015) across three schools in the UK (Chapter 4) and one in India (Appendix 4), and few have applied the Winterhouse Matrix to support a change in the scale and ambition of such interventions.

1.2 Definitions of key words and terms

key words and terms	summary definition and references
education	Education is defined as the all-round development of the human personality and the cultural and economic progress of the community (see p. 18).
learning tools	A series of prototypes designed and tested by the researcher in collaboration with children to help foster agency and knowledge of the UN global goals through creative workshops (see Chapter 4, p. 96).
agency	The capacity of an individual to initiate and perform actions and bring about change, both in their own state and in that of the outside world (see p. 30).
global goals	The United Nations have adopted seventeen global goals for sustainable development (see Appendix nine, p 272).
cognitive acceleration	Refers to Vygotsky's Zone of Proximal Development when students are encouraged to make knowledge co-operatively and to reflect on their thinking and problem solving processes (see p. 46).
accelerated learning	Is a method of study that fosters attention and motivation and enables material to be learnt in a relatively short time (p. 48).
metacognition	Encourages children to think about thinking (p. 49 and p. 89) and includes building knowledge of a subject (declarative), perceiving the way forward (procedural), and selecting appropriate learning strategies (conditional).
learning circles	Small communities of teachers and others who come together to support each other in the process of learning and research (see p. 22)
constructivist learning design	CLD enables children to recall lived experience, co-design and reflect upon making . It is the meta-structure for all Tol workshops (see 3.4, p. 72).
mosaic approach	This Reggio Emilia method of data collection and analysis helps merge research and teaching. It proposes that there should be no dichotomy between practice and theory (see p. 82)
visual narrative inquiry	A method that fosters the idea that knowledge emerges from narrative data held in stories, drawings, models, videos, animations, and photographs (see p.84 and p. 164)).
constructivism and constructionism	<i>Constructivism</i> is the process whereby students construct unique systems of knowing based upon personal experience. <i>Constructionism</i> is the process where students produce physical models containing knowledge that others can see and critique. In this educational frame, <i>constructivism</i> is more cognitive and <i>constructionism</i> is more physical (see p. 42).

Figure 1.1: Summary explanation of key terms with page references.

1.3 A vision for primary education

The ILO/UNESCO recommendation on the status of teachers (1966, p.21) reflects the position I have adopted in 'Theatre of the Imagination' to help nurture creative thinking and empathy (Biddle, 2018) in primary school children:

Education from the earliest school years should be directed to the all-round development of the human personality and to the spiritual, moral, social, cultural and economic progress of the community as well as to the inculcation of deep respect for human rights and fundamental freedoms; within the framework of these values the utmost importance should be attached to the contribution to be made by education to peace and to understanding, tolerance and friendship among all nations and among racial or religious groups.

Change is required, as called for in a letter to the *Guardian* newspaper (House, R., Tuesday, 22 May 2018), away from 'the commodification of education and an emphasis upon league tables'. The current fixation on testing is having a detrimental impact upon the mental health of children (Weale, 2017).

1.4 Evidence collected in support of new knowledge

Areas of potential new knowledge (Phillips and Pugh, 2010) relevant to 'Theatre of the Imagination' (ToI) include:

- **Continuing a previously original piece of work:**

I have been involved in award-winning art and design collaborations between HEIs and primary schools, in the UK, India and Mexico over the past twenty years (**Appendix 1, p.189**). Building on 'Escuela de Artes' and 'Colours of India', 'Theatre of the Imagination' sets out to collect further evidence that demonstrates how creative practice can nurture compassion in primary education. A study by YouGov suggests 51% of people in the UK believe there has been less empathy towards others (Booth, 2018) over the past year. The role of education in developing empathy and changing the perception of children is also highlighted by Booth.

- **The creative toolkit can be transferred independently of the researcher:**

Participants, teachers and practitioners helped me to test prototypes of the learning tools at primary schools across geographic space. Children, teachers, fellow

researchers and members of the learning circles, from all schools involved, generated effective examples of the creative toolkit being deployed. Detailed accounts of the workshops are presented in **Chapter 4** (p.96) of this thesis and in **Appendices two, three and four** (pp. 190-237) The toolkit is designed to encourage children to connect declarative knowledge with innovative thinking through co-design. And through the actions of cooperation, children foster metacognitive skills and personal agency.

- **Constructivist learning design (CLD) provides a meta-structure for my research:**

The workshops adapted Gagnon and Collay's (1999) CLD model to transfer signature pedagogies in art and design to primary education while nurturing agency and metacognition. The model helped to scaffold procedural knowledge in children. When used in collaboration with the Winterhouse Matrix for strategic change, action at the local level helps to drive macro-level change. The UN global goals foster declarative knowledge concerning the environment and global citizenship.

- **Drawing and making helps the researcher to reflect upon theory:**

Thinking through drawing and the co-production of 'mosaics' as a method of analysis may help primary teachers to explore theory while making new connections to practice. Contributing additional evidence in support of drawing as an effective tool in practice-led research may help teachers engage with research that is immediately applicable to the classroom.

- **Art and design may become a 'third culture' in primary education:**

According to Cross and Archer (1979), there is a lack of understanding of 'design as a third culture', one as significant as science and humanities. 'Theatre of the Imagination' adds to the existing body of creative learning methods designed to explore the UN global goals. The creative toolkit brings together numeracy, literacy, science and global citizenship to help scaffold learning.

1.5 The value of creativity in the curriculum

Government advisor Richard Hudson (2017) accepts that recent primary education policy is flawed: "We started off with the primary curriculum, which we were a bit unconfident about as none of us had much experience of primary education and were looking forward to getting stuck into the real thing: secondary".

Primary school leaders are warning that a funding crisis will force them into cuts that will have a life-changing negative impact on a generation of children (Roberts, 2018). The Cambridge Primary Review Trust report suggested that creative skills have significant potential to nurture self-regulated learning and self-efficacy in mainstream education. These are characteristics of agency which develop confidence and equality of opportunity.

A complication arises from Education Endowment Foundation (EEF) research into the effectiveness of signature creative pedagogies. Winner et al. (OECD, 2013) conclude:

We did not find support for the kinds of claims that we typically hear made about the arts – that infusing the arts in our schools improves academic performance in the form of higher verbal and mathematical test scores...and makes children more innovative thinkers. It is here that we have to conclude: not yet proven!

The EEF research report (2015) on the benefits of the visual arts in primary schools, within which it includes design, describes more than twenty case studies from the UK and US and suggests that the evidence, in all cases, is weak. The report is critical of qualitative research methods used by teachers. The inference is that the EEF prefers statistically based, large-scale methods of data collection and analysis, designed to demonstrate a direct causal link between a particular subject and its teaching method's impact on learning.

The EEF position is not shared in 'Theatre of the Imagination'. When class teacher Isabel asked Matteo in what way 'Make Your Move' was different to the way he would normally learn in school his response was compelling (**Appendix two: p.217**):

It's kind of like bringing together DT, art and literacy. In school we don't normally bring those subjects together – in literacy you normally have an aim decided by the teacher, but this was more 'free' and more for us to decide. We had to decide on the story and on what our characters looked like. It made me feel kind of like a master. I dunno... in charge.

1.6 The value of interpretivism

Alexander (2017) established that individual autonomy is undermined when learners are subjected to knowledge transmitted in one direction, from the 'expert' to the learner, in preparation for tests used to assess numeracy and literacy. The interpretivist approach is

designed to help establish new practices, co-created by participants, to challenge the status quo and 'ways of being'. Nurturing responsible citizens with a developing sense of their identity and place in the world is at the heart of this investigation. At a time when actions in the realm of ideology, as in the realm of technology, have global effects, it is increasingly important for children to be given the opportunity to develop and express an independently constructed opinion.

The interpretivist approach has it that individuals are not just puppets who react to external social forces. The proposition is that individuals are intricate and complex, different people experience and understand the same 'reality' in very different ways and have their own reasons for acting in the world. The research methods derive from social action theory, which proffers that people's behaviour and life chances are not determined solely by their social background and emphasises the role of the active individual and interactions between people in shaping personal identity and, in turn, wider society (Given, 2008). To understand human action, we need to uncover the individual's own motives for acting. This requires empathy, to see the world through the actors doing the acting, and helps to define the ontological position of 'Theatre of the Imagination'. The interpretivist paradigm is committed to understanding the 'other' by learning to stand in their shoes and look through their eyes (Taylor and Medina, 2013). Interpretivism nurtures intersubjective knowledge construction which can be achieved through art and design practices in tandem with ethnographic methods and an explicit effort to co-construct ethically sound relationships.

1.7 Rationale for working with the UN global goals

The UN global goals framework was widely distributed to primary schools, including Halstow School, by local education authorities in 2015, which coincided with the introduction of the 'Make Your Move' workshop. This timely intervention provided me with a ready-made framework for exploring social and environmental issues through art and design in the curriculum. Hunt et al. (2015) found that global goals at primary level are linked to higher awareness of diversity and to developing learners as socially aware, responsible citizens. Hunt and fellow researchers at UCL also found that most respondents believe that global learning helps foster community cohesion, school ethos and 'pupil voice'. The global goals framework is congruent with the aims of my research as it encourages children to develop a

position related to social justice, poverty and climate change. The global goals, presented via a website, contain helpful examples and has the support of more than 150 world leaders.

The workshops introduced facts about the world we inhabit, and skills related to making thoughts visible. Creative workshops enabled primary students to articulate their thoughts and feelings through design and making. Students were encouraged to become agentive to help articulate personal ideas concerning complex environmental and social issues (Bruner, 1996, p.93) and to act in their local environment, at school and at home.

The project set out to transfer signature pedagogies from art and design tertiary education into primary schools. My purpose in combining signature pedagogies and global learning goals is to encourage aspects of responsible stewardship and care for others (Tunstall, 2016; Rogers and Bremner, 2017; Thompson et al., 2012) while building personal agency.

1.8 Writing in the first person

The interpretivist approach remains a constant throughout the thesis and I use the first-person to emphasise the participatory nature of the design process. This is particularly prominent in Chapter 4: 'Theatre of the Imagination' Workshops and in Chapter 6: Recommendations - to highlight the reflective nature of participatory interpretation and the qualitative approach used to formulate recommendations.

1.9 The composition and function of learning circles

Collay et al. (1998) describe learning circles as 'small communities ... who come together intentionally for the purpose of supporting each other in the process of learning'. In 'Theatre of the Imagination' this purpose embraces collecting and triangulating qualitative data in the process of research. Members of the learning circle co-operated with me by helping to examine the relationship between concepts generated by children from the starting point of a selected global goal, through the production of artefacts, stories and videos born out of those concepts. Learning circles examine aspects of agency, metacognition and empathy reflected in outcomes and comments made by participants. Central to this process of analysis is the time given to thinking about the effectiveness of the creative toolkit as an exegetic vehicle for practice-led research in schools.

Children, facilitators, teachers, governors and parents share visual, oral and written ideas in advance of workshops, during workshops, and after workshops. Learning circles take place in studios; corridors; exhibition displays; and local pubs, where I act as convener and host. 'Theatre of the Imagination' emphasises an interpretivist approach and may assist professional development. Exchanges take the form of a chat, a small-group seminar, or a critical appraisal of outcomes and thoughts emerging from the workshops (**Figure 1.2**).

The roles of members of the learning circle vary to include: generating data; collecting and presenting data; constructing mosaic tiles of data; interpreting data; critiquing tentative findings; suggesting revisions to future workshops; and reflecting on participants' ideas. The role of the researcher is as a composer and conductor of the performance, reflecting the role of the teacher-facilitator in the process of constructivist learning design.

Piaget (1955) suggested that to understand is to invent; the learning circles provide a platform for shared meaning-making and understanding. New conceptions of how design thinking and practice nurture agency, metacognition and global citizenship may help to foster more careful and responsible stewardship by children of their environment and greater compassion for all living things. If we want a whole community defined by the co-operation, equity and mutual respect of all members, then the relationship between individual and organisation must be reciprocal. Learning circles act as bridges between the research output and findings related to how design and making can impact upon cognitive and non-cognitive skills in primary education.

Lambert et al. (1996) refer to what they call 'constructivist collaboration':

There are the actions and interactions among willing participants that result in learning. Constructivist collaboration usually involves a combination of talking, listening, observing, doing, thinking and reflecting. Collaboration has a variety of purposes and is often initiated by a specific focus or need. The process of collaboration may lead to discovering emerging understandings and needs. (p.75)



Figure 1.2: Members of the Halstow School Learning Circle discussing data tiles (2017)

When teachers have the autonomy and personal support necessary to move away from the normal or institutional behaviours they can reconfigure notions of teaching, learning and leadership. Building theories of action in the company of like-minded practitioners helps to ensure an authentic voice and builds trust (**Figure 1.3**).

	Generating data	Collecting & presenting	Constructing mosaic tiles	Interpreting & analysing	Critiquing findings	Reflecting on findings	Suggesting revisions
Tom Gray: headteacher, Halstow						○	○
Isabel Pulley: teacher, arts co-ordinator, Halstow	○	○	○	○	○	○	○
Charlotte Stirling: class teacher, Halstow	○	○	○	○	○	○	○
Halstow children	○	○	○	○	○	○	○
Elle Garcia: student	○	○	○				
Gill Moss: headteacher, West Dean						○	○
Sharon-Michi Kusunoki: governor at West Dean	○	○	○	○	○	○	○
Robin Wilcox: class teacher, West Dean	○	○	○	○	○	○	○
Maria Garcia: art and design practitioner	○	○	○	○	○	○	○
West Dean children	○	○	○	○	○	○	○
Andy Carpenter: deputy-head, PSCA					○	○	○
Huw Jones: teacher, PSCA				○	○	○	○
Cass Bisco: link-tutor, PSCA				○	○	○	
PSCA children	○	○	○	○	○	○	○
R. Pulley: researcher	○	○	○	○	○	○	○

Figure 1.3: Members of learning circles with their contribution shown as a greyscale (2018)

1.10 The nature of the data and the workshop process

Drawing, making and storytelling were introduced to help participants depict personal experiences and to generate imaginative ideas related to cosmopolitan localism (Manzini, 2015) through the articulation of implicit knowledge. The situation for each workshop was established by a selected global learning goal and the exact nature of the creative exploration undertaken by participants was found and not simply given. Physical outcomes were considered to be critical artefacts (Bowen, 2009) and were used to provoke storytelling and good discussions in the context of participatory action research (Reason and Bradbury, 2008). The models and videos assisted teachers, practitioners and me with visual narrative inquiry (Connelly and Clandinin, 2006, p.375) related to children's ideas during 'crits', a signature pedagogy in art and design. According to Connelly and Clandinin, narrative inquiry is a way of understanding and inquiring into experience through 'collaboration between researcher and participants, over time, in a place or series of places, and in social interaction with milieus' (2000, p.20). And this helps to define the nature of studio-based inquiry and 'the crit' as a vehicle for visual narrative analysis through design.

Making mechanical models requires mathematical and scientific knowledge. When model-making and mechanics are also used as a foundation for translating lived experience into creative stories, art and design practices in primary schools begin to offer learner-friendly activities that are congruent with UK government aims for primary education. 'Theatre of the Imagination' offers a creative toolkit and an approach to teaching in primary schools which integrates numeracy, literacy and science to help explore axiological questions aimed at responsible stewardship of the environment and greater compassion in society.

Embodiment of this nature may be achieved through experiential learning (Kolb, 1984) when children move from having an experience in the world to abstract conceptualisation. What learners make of these stages will determine what they learn from the experience and so having time to reflect is crucial. Metacognition encourages children to engage in a second-think time, and to think about thinking. Dialogue with peers generates dissonance which often provokes reflection and new ideas. As concepts collide, they are dented and changed and, although informed by earlier thoughts, take on an entirely new slant. Chow

(2009) refers to this as case transfer, a kind of abduction, and this study emphasises the contribution thinking and making can make to abstract conceptualisation.

Gagnon and Collay (2006, p.3) note that ‘... most of us are familiar with learners who memorise well and can restate facts, but they still struggle to articulate the meaning because they do not understand the concept’. Yet, in recent years, instruction of facts has gained ascendancy in mainstream primary education and project-centred learning (**Figure 1.4**) has been subjected to increased criticism.



Figure 1.4: Project-centred learning and data analysis in ‘Theatre of the Imagination’ (2016)

Grehan (2016, p.272) believes that:

Due to the limitations in working memory children find it difficult to discover concepts first. It is essential they realise things for themselves, and have their lightbulb moment, but this is best brought about by a lesson that is heavily structured by a teacher, in which she builds up student knowledge and understanding through clear explanations,

open questioning, and modelling. Only when they've understood a concept can they think critically about it, make use of it to solve problems and be creative with it ...

Constructivist learning design (CLD) provided a robust structure for 'Theatre of the Imagination'. The theme for each workshop references a particular United Nations global goal and the modified CLD model comprises the following stages:

- (i) Situation** (approx. 20 minutes)
I present facts related to a global goal. Participants take part in a question and answer session and a general discussion.
- (ii) Groups** (groups are normally pre-planned)
Between four and 12 children work individually and together in duets and quartets, supported by a class teacher and by me.
- (iii) Bridge** (approx. 20 minutes)
Participants create drawings, models, videos and photographs to provoke discussions concerning experiential knowledge and imaginative ideas related to an event from everyday life related to a specific global goal.
- (iv) Task** (approx. 60 minutes each session, separated by a break)
 - (a) Models are developed from drawings and storyboards by transforming ideas on paper into three-dimensional wire 'sketches'.
 - (b) The second part of the workshop is spent making video animations.
- (v) Reflection** (approx. 30 minutes)
Participants complete a questionnaire before and after the pilot workshop and take part in critiques and 'good discussions' (Bradbury, 2001).
- (vi) Exhibition** (approx. 60 minutes and sometimes work is 'left up')
The drawings, automata, videos and stories are viewed by participants, teachers, peers and parents and provoke visual narrative analysis.
- (vii) Evaluation** (between 20 minutes and two hours)
Reflection and interpretation with participants and class teachers and by members of the learning circle help to highlight important evidence.

1.11 A 'mosaic' approach to data collection and analysis

Each workshop followed a unique path through the CLD process, depending on local circumstances and in response to unexpected events. I discussed outcomes with participants and teachers during the workshop, in front of displays of work, and in small seminar groups. The themes of the enquiry helped to organise the data using a mosaic approach (Clark and Moss, 2011).

The mosaic approach is designed to help children and teachers participate in data sharing and analysis. One example of how this worked can be seen in 'Bags of Fishy Stories'. Envelopes were constructed by folding and stitching images of the sea creatures designed by children at Plymouth School of the Creative Arts. The envelopes contained drawings, completed questionnaires, participant quotes and photos of models for critical analysis by participants and the learning circle. Children created stories which described the agency of their magical sea creature and represented imaginative ideas in a concrete way.

Data collection began with a pre-workshop self-evaluation. This took the form of a questionnaire designed with help from the learning circle at Halstow School. The questions focused on aspects of agency, metacognition and the global goals. Outcomes helped to highlight the difference between children's feelings and skills before and after each workshop. Feedback and the thoughts of children were also collected through one to one and one to small group question and answer sessions. During the workshop, I paused to ask individual participants, duets, quartets, and whole groups questions about their drawings, models and videos. The team, including children and members of the learning circles, took photographs and video footage to review alongside my field notes. This helped us to capture thoughts and reflections during and after the events (**Videos 5, 6, 7**).

The key themes related to the research question provided a structure for grouping data (**Figure 1.5**). Field notes, drawings, models, stories and video snippets then served as evidence in the process of analysis. When gaps in the evidence appeared, feedback through participatory action research (PAR) informed the process of workshop improvement. 'Mosaic tiles' of information were displayed in local exhibitions to inform further discussions with participants, teachers and members of the school community. This helped to determine what people considered to be insightful and why. Tentative findings were agreed

by members of the learning circle in such a way that can be affirmed or contested in future research studies by following the same process in other locations. This is a distinguishing feature of constructivist research undertaken by a specific group of people, in a specific cultural context, at a specific time.

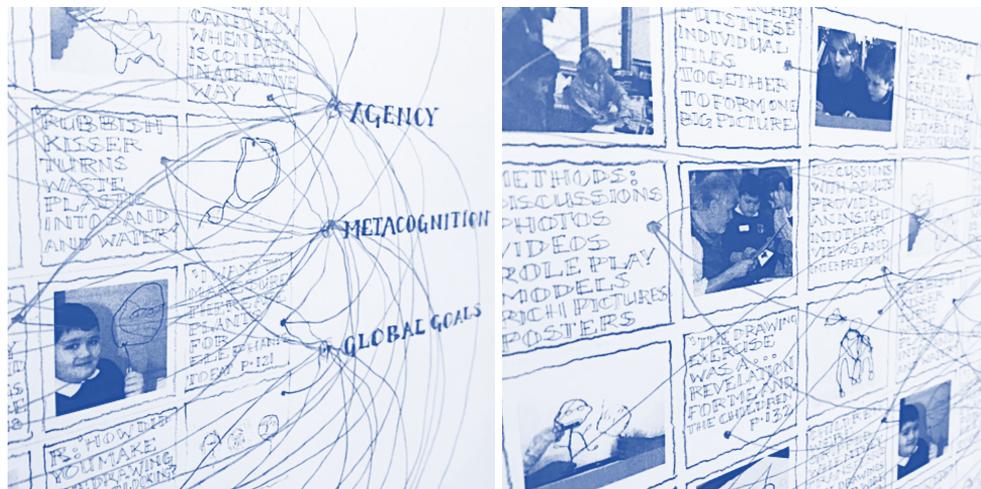


Figure 1.5: 2D mosaic tiles created by participants and the researcher (2017)

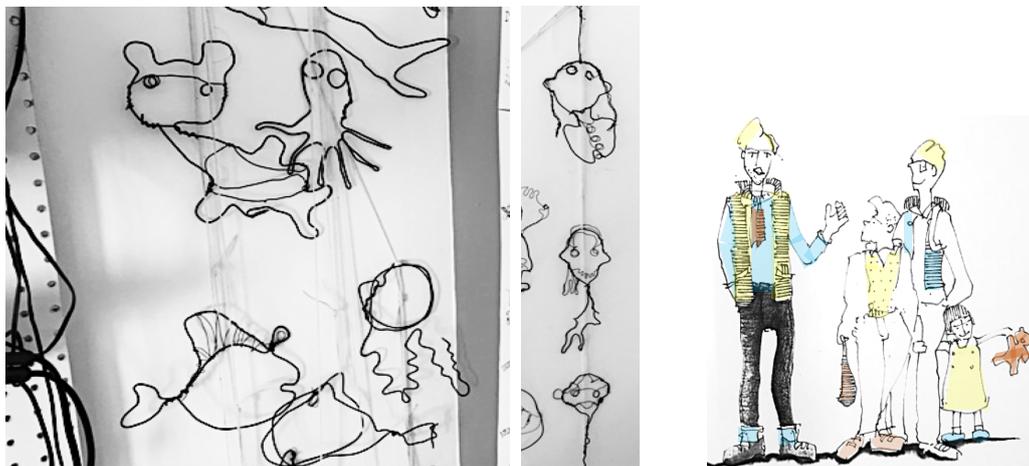


Figure 1.6: 3D Models as mosaic tiles – feedback on 'Life Under Water' (2017)

1.12 How visual narrative analysis can provide evidence of agency

Thematic and visual narrative approaches to analysis (Bach, 2007) lend themselves to the constructivist paradigm and support the process of interpretation through reflection by participants. My field notes and rich pictures were part of the process of collecting feedback from participants and reflecting through drawing and writing. Video and audio recordings also helped to capture the thoughts of children and members of the learning circles.

Visual data including drawings, 3D models, photographs and animations was used to elicit stories from children and teachers to demonstrate agency and design thinking related to the UN global goals. These visual representations also constituted critical artefacts, used as a starting point for discussion in critiques by members of the learning circles.

While artefacts can be the subject of reflective analysis and inquiry they also provoke insightful, visceral responses in the observer. According to Norman (2013, p.50) the visceral human response to an object is “ingrained, automatic and ‘animalistic...’”. In contrast, visual narrative analysis in ‘Theatre of the Imagination’ has the benefit of allowing the examination of agency evolving from interaction between the individual and social context over time (Archer, 2000). Sairanen and Kumpulainen (2014) suggest we lack research on how different activity settings and their sociocultural resources mediate the sense of agency in children. The activity setting of interest in this study is ‘the studio’ and by this I mean the combination of people, materials, tools, and spaces for creating and making in schools.

The subtext of a narrative is invariably more significant than what appears to be explicit. For this reason, reflecting on visual information goes beyond *what* is depicted or said and considers *how* it is depicted and explained by the narrator (Cousin, 2009). Applying visual narrative analysis in primary schools therefore demands ‘active listening’ in the process of participatory action research. Visual narrative inquiry is about the form and the content of the stories children tell, and their personal histories influence interpretations. My role, and the role of teachers involved in the workshops, was to help reveal a persuasive interpretation of the creative stories visualised and told by children through discussion and reflection. The purpose of the workshops was to pinpoint events and exchanges that demonstrate agentic actions by children in the process of learning through design and making (pp. 164-172).

Sairanen and Kumpulainen believe that children form their identities by integrating life experiences within an evolving story of ‘the self’. They suggest that visual narrative is a dynamic process that constitutes a way in which we organise events and experiences in our lives to make sense of them, and the way in which we participate in creating the things we make sense of, such as our identity. The visual narration of an individual’s sense of agency and identity integrates their reconstructed past, perceived present, and imagined future. To establish underlying meaning, and to uncover what was not explicit, I initiated informal

discussions during and after each workshop. Participants made drawings using different techniques and produced storyboards, models, and video animations of their ideas and wrote short stories related to the UN global goals.

The themes of 'Theatre of the Imagination' were implicit in the self-assessment questionnaires (p.91) and in the project aims (p.15). The aims and objectives of a session were discussed at the beginning of each workshop. Data was subsequently collated by participants, members of the learning circles, and by me in preparation for analysis. The process of clustering visual narrative information and other data, into cohesive groupings, is akin to constructing visual 'affinity diagrams' (Kawakita, 1960s, n.d.), with an emphasis upon sorting information collaboratively. A participant in Plymouth described the process as being "...like Dumbledore's pensieve...in Harry Potter" (Rowling, 2014, p. 490).

Children were encouraged to help document their feelings about developing new skills and nurturing problem exploration through creative practice. Visual artefacts helped to triangulate other evidence gathered from self-evaluations, and prompted discussions and design thinking. I supported children in their work and gained additional insights through their narrative accounts by taking an active part in the creative process. Children contributed to questions and answers sessions, informal interviews, and small group seminar discussions. During the exchanges I invited participants to explain their drawings, models, video narratives, and the mental connections they were making.

Our discussions were logged and members of the learning circles and other members of the school community, including parents and school governors, helped me to review the children's accounts of their work. Selected outcomes of the analyses are presented to help portray the children's sense of agency through: a) what they were able to do; b) what they felt and wanted; c) what they felt they could influence (**Chapter 4: p.164**).

Artefacts used in the visual narrative inquiry included automata and videos of the moving toys at Halstow School (**Appendix two, p.199; Video 5**); wire self-portrait puppets and talking peg videos at Halstow and West Dean Schools (**Appendix two, p.199; Video 6**), 3D storyboards and collages at West Dean School (**pp. 129-162; Videos 7, 8, and 9**), magical sea creatures and videos at PSCA (**pp. 98-126; Videos 11, 12**). The biospheres made by children and students at IITB (**Appendix four, p. 223; Video 13**) also provide evidence in support of a

nascent network of schools engaged in global learning using the expanding creative toolkit. When children explained what they had learned during the workshops, they referred to increased confidence in 3D making, skills in storytelling, and exploring new resources offered in 'the studio' environment.

1.13 Findings

Evidence suggests that normative quality assurance procedures in the 'broken' primary sector (Burkitt, 19 November 2016) need to be eased to give teachers in mainstream schools an equal level of control to that of teachers in private education. Under these circumstances, adapting creative pedagogies from tertiary education may help to reset the balance between teaching to tests and developing agency and metacognition in children. An analysis of qualitative data arising from the creative workshops indicates that exploring the UN global goals through design and making can help nurture agency and empathy in children. Their contribution, collected and assessed through discussion and self-evaluation has been fundamental to the interpretivist nature of my study.

1.14 Implications

Thompson and Hall (2014) explain that the production of artefacts and experiences is a mechanism through which we can create changes in the world that influence our sense of who, where and what we are. 'Theatre of the Imagination' adds weight to this assertion. New approaches to nurturing cognitive skills through creative practice may also enhance 'pupil voice' in mainstream primary students. Research undertaken for the Education Endowment Foundation Toolkit (EEF, 2017) suggests that the arts do not have a significant impact on accelerating learning in UK primary education; 'Theatre of the Imagination' workshops demonstrate that this conclusion is inaccurate and potentially damaging.

Manzini (2017) explains that diffuse design is performed by everybody and expert design is performed by those who have been trained as designers. Working together may help foster meaningful social changes within local communities (**Figure 1.7, p.62**). Cosmopolitan localism is founded upon values and meanings which echo those made explicit through the United Nations global goals: social justice and responsible stewardship. The ethical threads that connect 'Theatre of the Imagination' and social innovation may also help to promote transition design thinking, as Irwin (2015) suggests:

Fundamental change at every level of our society is needed to address the issues confronting us in the 21st century. Climate change, loss of biodiversity, depletion of natural resources and the widening gap between rich and poor are just a few of the wicked problems that require new approaches to problem solving.

Taking responsibility for the stewardship of our planet, according to Bremner and Rodgers (2013), is fundamental to the pressing question of our time: how can we make the world a better place? The drive to integrate humanities and science through design provides fertile ground to foster a 'third culture' (Cross, 1979) in primary education.

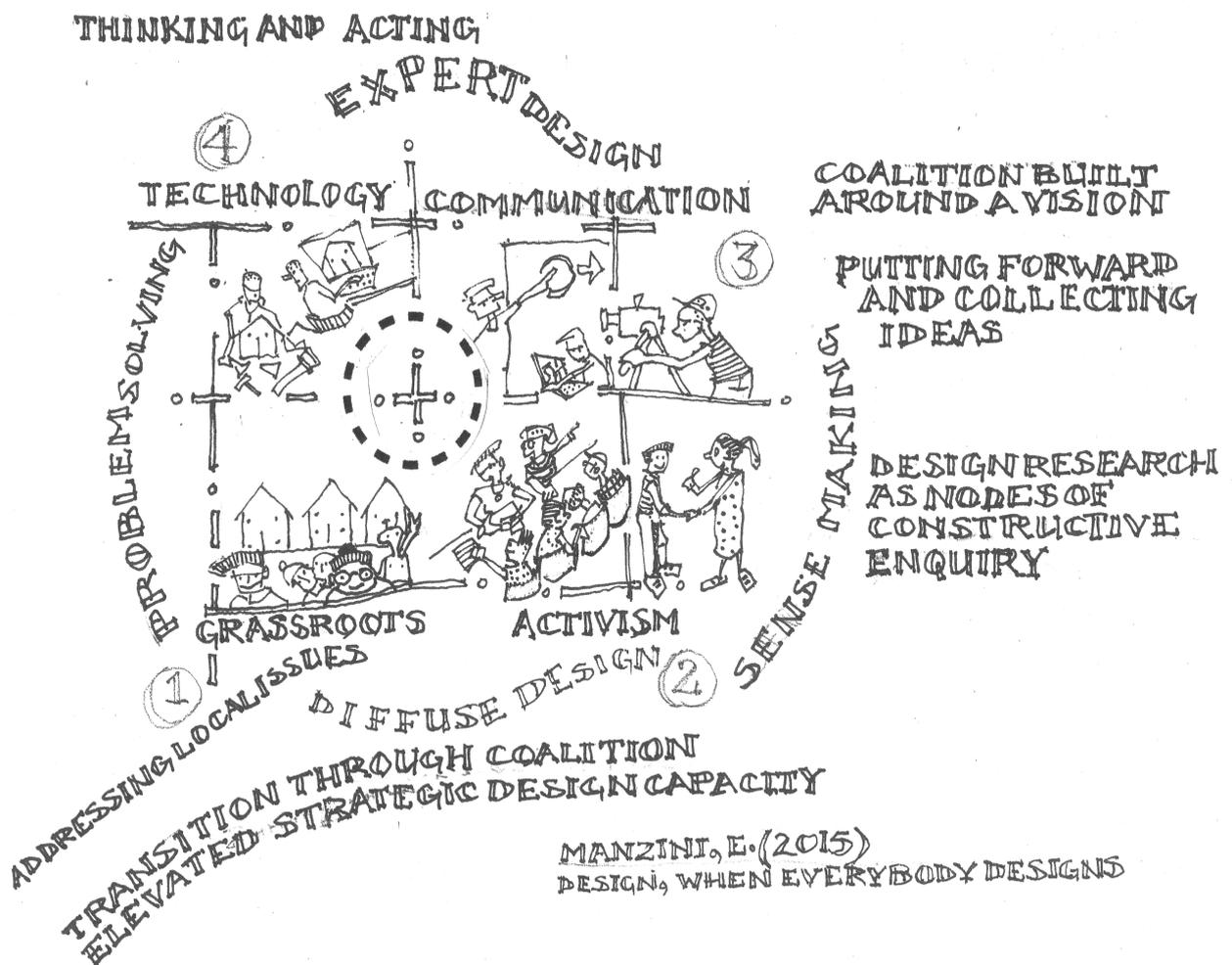


Figure 1.7: Design: When Everybody Designs (from Manzini, 2017)

2.0 Key concepts and literature

'Theatre of the Imagination' explores global citizenship, personal agency, metacognition and design education. Readings have helped to integrate theory and practice and have enabled me to develop, implement and report on a series of educational workshops that set out to explore interactions and behaviours at Key Stage 2 in primary schools in the UK. This research journey explores the terrain of transition design and sets out to conceive a series of steps towards a new paradigm for transition design primary schools. The theoretical concepts are applied to the development of a creative toolkit, aimed at helping to build agency through creative practice.

2.1 Research through creative practice

Jonas (2007) framed 'research through design' as a holistic integration of knowledge from other disciplines: iterative in nature, leading to deeper insights; focussed on the future; aiming towards innovation; and an interaction between learning through making and reflection on the context. The tools for research through design are objects, designs, prototypes and mock-ups (Koskinen et al., 2011), which enable information and insights to arise that differ from information resulting from observations or interviews alone. While Friedman (2008) criticised the term for lacking a strong theoretical foundation, Koskinen et al. (2011) helped clarify 'research through design' as constructive research, concerning the creation of something as 'a legitimate method in its own right'.

The creative workshops in primary schools set out to encourage the creation of objects and mock-ups. The 'toing and froing' of thinking and making is antithetical to research methods which make a distinction between theory and practice. Art and design researchers continue to develop their methods in the face of those of a more traditional nature accepted by the academy. Cannatella (2015, p.7) suggests:

An art production can express and develop our understanding of who we are and of what matters to us - a thought that Hegel developed in his idea of art as the articulation of a culture's self-understanding. Gaut's (2007, p.6) account of art certainly signifies the common good since we see the value of art at times when it explores moral issues ...

2.2 Concerns about general education in the UK

Ken Baynes and Eddie Norman (2013, p.11) despaired at the nature of the government's proposal for the National Curriculum for Design and Technology, introduced in 2013. They explain:

It is not simply that Mr Gove's team have ignored leading figures in the design, engineering and media industries, employers, organisations and specialist teachers' associations: it is also that they have completely failed to recognise the value of Britain's contribution to design education ... [we] encourage young people to use their imaginations, consider the needs of others and look to the future.

The concern is that there is a complete lack of understanding of 'design as a third culture' (Cross, 1979), one as significant as science and humanities. In 1974, Bruce Archer led the Design in General Education programme at the Royal College of Art. The program aimed to increase awareness of design by integrating design activities into the curriculum of secondary schools. Archer explained (1979, pp.18–20):

Science is the collected body of theoretical knowledge based upon observation, measurement, hypothesis and testing, and the Humanities is the collected body of interpretive knowledge based upon contemplation, criticism, evaluation and discourse, the third area is Design, the collected body of practical knowledge based upon sensibility, invention, validation and implementation. ... In Design, the repository of knowledge is not only the material culture and the contents of the museums but also the executive skills of the doer and maker.

Phil Roberts (Baynes and Norman, 2013, pp. 13-19)) outlined the characteristics of design in general education (pp.13–19), and some of his ideas are woven into the structure and content of the 'Theatre of the Imagination' workshops, such as designing as a medium of cognitive modelling and of acting on and in the world. Roberts believes that design education has the capacity to enhance the capability, knowledge and understanding of the learner who is thereby empowered to bring about desirable change in some aspect of the world. According to Roberts (2013), people who develop design skills such as making images and models of a world seen 'in the mind's eye' have the capacity for engaging in cognitive

modelling. He explains that the activities related to 'designing as learning' can be referred to as the design dimension of the school's entire curriculum, and how agency fosters metacognition.

The question, according to Roberts, is not whether it is possible for this way of thinking and doing to be introduced into primary education but whether sufficient funding, know-how and support for such far-reaching changes can be garnered in the present climate of austerity and fear. These proposals require a visionary leap of faith by a government that is embroiled in a destructive process of attrition with the teaching profession. Roberts concludes the argument for his proposals in the following way:

The design and production of things is a particular case of designing, not the general case. Designing can be described, at a high level of generality, as to do with change or better, with changing: change in the agent of the activity and change brought about through the activity. Artefacts are means, not ends, the required ends consist in change.

(2013, p.19)

According to Baynes (2013), design occupies a key position in a 'satisfying lifestyle' because it is concerned with the future and, he warns, concepts of growth need moderating by a vision of the possible repercussions. Essential to this problem is imagination, creativity and practical skills in making and management. This journey can begin in primary education.

2.3 The potential for new knowledge

Robin Alexander (2014), director of the Cambridge Primary Review Trust, collected extensive evidence and summarised his team's findings through a set of priorities for future curriculum development. The findings stressed the importance of taking seriously the arts, science and lived experience (van Manen, 2016). Lived experience emphasises interpretivist models that place human situatedness centrally and suggests that we may best understand individuals through experiential and thoughtful praxis. 'Theatre of the Imagination' workshops set out to develop and test tools that foster ways of helping primary students and teachers by exploring pedagogies used in art and design higher education (Thompson et al., 2012). The proposition is that these pedagogies may help to nurture agency and insights

related to global citizenship. Transferring 'ways of being' and skills from art and design to primary education also has the potential to foster independent learning and to develop 'pupil voice'. This is based on the belief that 'design thinking' fosters a set of values that may be shared in the studio. Kitchin and Blades (2002) remind us that any research that studies behaviour must take into account the knowledge that an organism has its environment.

Theodore Lewis (2005) suggested that there is some way to go before creativity becomes a core feature of teaching art and design and, therefore, for creative behaviour to be a central theme in education from primary to tertiary levels, new pedagogical approaches may be useful. New knowledge emerging from a qualitative analysis of the effectiveness of transferring pedagogies may help to develop a more holistic and creative approach. Reviewing the concept of a worthwhile education is advocated by headteachers involved in 'Theatre of the Imagination' and researchers such as Hunt (2013). If my research discovers that creativity has a significant impact on cognitive acceleration through the development of metacognition in mainstream primary education, this tentative finding would be crucial to restoring the balance between knowledge and skills in future research.

2.4 Three pillars of theory

Three major concepts help inform 'Theatre of the Imagination', and their counter-positions are considered in parallel. The first theoretical territory relates to constructivism in mainstream education. Selected learning and teaching methods will be tested in workshops to determine if personal agency and metacognitive skills can be fostered through creative practice at Key Stage 2. The relativist approach will be compared to other approaches, including the positivist approach, promoted through the Programme for International Student Assessment (**PISA, www.oecd.org/pisa**) and through government policy intervention in the UK (Oates, 2010; Christodoulou, 2014).

The second conceptual landscape, transition design (Irwin et al., 2015), helps to determine how long-term visioning on the part of the researcher informs action at the tactical level and change at the strategic level, aimed at fostering responsible stewardship for the next generation. Transition design embraces cosmopolitan localism (Manzini, 2015) and reflects Schaar's axiom:

The future is not some place we are going, but one we are creating. The paths are not to be found but made. And the activity of making them changes both the maker and the destination.

(1981, p.321)

The third area of interest underpinning the research relates to global citizenship in primary schools and the introduction of the United Nations Global Goals for Sustainable Development. On 25 September 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development (<https://www.globalgoals.org>), hailed by the secretary-general as a universal, integrated and transformative vision for a better world. While these goals are contested, and the concept of sustainability has come under increasing scrutiny, the United Nations has made a significant investment in creating and promoting an international framework for dialogue concerning empathy, social justice and conservation of the natural environment. The theme of each 'Theatre of the Imagination' workshop reflects a UN target and a global goal such as 'Reduced Inequalities', 'Life below Water' and 'Life on Land'.

2.5 The education landscape

The first 'pillar of theory' relates to signature pedagogies in art, design and making (Orr and Shreeve, 2018; Thompson et al., 2012). The theories underpinning the 'Theatre of the Imagination' workshops reflect a constructivist epistemology and seek to introduce practices capable of helping to heal the 'broken' primary school system (Burkitt, 19 November 2016).

'Theatre of the Imagination' is engaged in making things and counters the demise of learning through making in primary education, as emphasised in the Crafts Council Manifesto (2014) and decried by many educationalists across a spectrum of disciplines. One example of this, of considerable concern to society, is Kneebone's (2017) call for early years education to redress the loss of haptic skills required by medical students who progress to become surgeons.

Constructivists argue that individuals experience the world based on what they already know and believe. New experiences are perceived through the lens of old knowledge, so we

make different meanings from the same event. The creative workshops are conceived to encourage children to collect ephemera, co-design, make artefacts and enter into dialogic discussions around objects and videos in the manner of ‘constructionism’ (Papert, 1993, p.181). Seymour Papert (**Figure 2.1**) advises educational innovators “to adopt dynamic cultural trends to carry out their educational interventions, through the process of constructionism”. Papert supports Piaget’s proposition that learning happens most effectively when people are active in making tangible objects in the real world (Piaget, 1955; also see pp. 41-43). He also advocates that such learning take place in a participatory way and ‘Theatre of the Imagination’ sets out to follow his example.

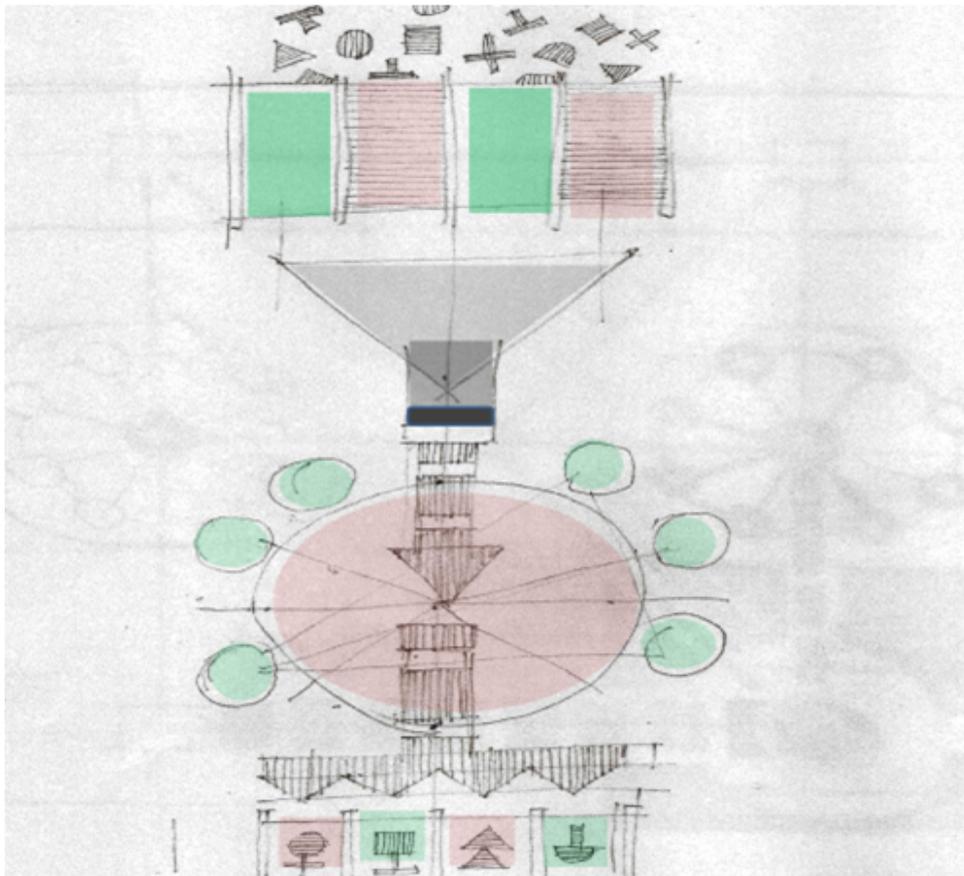


Figure 2.1: ‘Constructionism’ (Papert, 1993) in ‘Theatre of the Imagination’ (2016)

Critics of constructivism suggest that it is impossible to make comparative judgements about statements made by those holding contrasting world views if such views are incommensurate. The argument questions how communication about ‘truth or falsity’ could be established within such an epistemology. Constructivism compels people to respect the alternative world views of oppressed people (Kincheloe, 2008) and presupposes that there

is a tendency for the hegemonic views in a society to constrain dissonance and determine a mindset. Kincheloe explains that knowledge is socially constructed and the knower and the known are inseparable. He promotes the value of the insights of those who have suffered as the result of existing social arrangements when trying to make sense of the world by acknowledging personal experiences.

In contrast to constructivism, a positivist curriculum is based on securing a selection of 'objective facts'. In relationship to primary education, it is designed to inform the attitudes of students through a set of cultural values which determine a world view. A post-positivist approach promotes greater interaction between teacher and participants and aims to produce generalisable knowledge about social patterns, while the interpretivist paradigm is committed to understanding the 'other' by learning to stand in their shoes and look through their eyes (Taylor and Medina, 2013). The interpretive paradigm, applied in 'Theatre of the Imagination', nurtures intersubjective knowledge construction through a process of interaction using art and design practices in tandem with ethnographic methods of informal interviewing, participant observation and ethically sound relationships.

Design and making embrace the senses and promote learning through thinking and doing. This is, in a literal sense, an embodiment of knowledge. Embodiment of this nature may be achieved through experiential learning (Kolb, 1984). Constructionism focuses on the art of learning, or 'learning to learn', and on the significance of making things in learning which supports the idea of developing metacognitive skills through design and making. Papert is interested in how learners engage in a conversation with artefacts, how these conversations boost self-directed learning, and facilitate the construction of new knowledge. Integrating constructionism and constructivism highlights the processes by which individuals make sense of their experience as they foster new interactions through making.

And this critical stage informs active experimentation when learners plan and try things out. Ironically, sticking to the plan may not be the productive option and may be set aside. Working in the design studio is to practise in a social world where 'studio pedagogies become embodied in the culture' (Orr and Shreeve, 2017, p.30). And declarative knowledge is also fundamentally important, but it is not in lieu of embodied or arrived-at knowledge through the 'stickiness' of materials and the feeling children might get from using a pencil as

a tool for wire bending for the first time. And neither does it need to be polemical to learn facts about the world before using a new tool to create and discuss the result of synthesising a multitude of different forms of knowledge, across disciplines.

2.5.1 Constructivism and constructionism

Constructivism and constructionism are connected but distinct viewpoints concerning the nature of knowledge (Ackermann, 2001). Both are important to 'Theatre of the Imagination' and the approach I have taken to learning through the use of the creative toolkit.

Constructivism offers a 'gateway' into what children are interested in, and able to achieve, at different stages of their development. Piaget (1967) describes how children's ways of doing and thinking evolve over time and he believes that children have good reasons not to abandon their worldviews just because someone tells them they're wrong. Constructionism (Papert, 1980), focuses on 'learning to learn', or metacognitive thinking, and the significance of making things. He also demonstrates how conversation can be 'mediated' through artefacts to help learners construct new knowledge.

Ackermann suggests that if we believe that knowledge is actively constructed by the child in interaction with her world, then we offer opportunities for children to engage in hands-on explorations. According to Piaget, children have their own coherent views of the world which differ from those of adults. Their views of the world change through contact with others and with things, and children interpret what they hear through the filter of their own knowledge and experience. Papert suggests knowledge is experience that is acquired through interaction with the world, people and things. Piaget is criticised by some educators because, unlike Papert, he appears to overlook the role of context in human development. But it is important to note that Papert's 'constructionism' is a theory of learning based upon Piaget's constructivism. This is not coincidental as they worked together in Geneva in the late 1950s.

Papert (1991, p.1) explains:

Constructionism—the N word as opposed to the V word— shares constructivism's view of learning as 'building knowledge structures through progressive internalization of actions'... It then adds the idea that this happens especially

feliculously in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe.

Because of its emphasis on learning through making, Papert's approach helps us understand how ideas get transformed and made in particular contexts using particular media, by individual minds. Making ideas tangible and shareable helps children to communicate with me as the researcher through the visual artefacts and related narratives we share.

Vygotsky focussed his attention on the role of cultural artefacts—tools, language, people—as a resource for drawing the best out of every person's cognitive potential and his work sits alongside the 'two giant Ps' of education theory. Ackermann suggests that Papert's constructionism is 'more situated and more pragmatic' than Piaget's constructivism or Vygotsky's socio-constructivism. Papert believes knowledge should not be detached from the situations in which it is constructed and made. This perspective on knowledge, that it lives and grows in context, has led to looking at individual people's 'ways of knowing'. Situated approaches to human learning and development suggest that individuals develop 'tailored' ways of thinking in given situations (Papert and Turkle, 1991).

Papert (1991, p.10) contests:

Traditional epistemology gives a privileged position to knowledge that is abstract, impersonal, and detached from the knower, and treats other forms of knowledge as inferior. But feminist scholars have argued that many women [and/or scientists] prefer working with more personal, less detached knowledge... they prefer the more concrete forms of knowledge favored by constructionism to the propositional forms of knowledge favored by traditional epistemology.

Piaget and Papert believe children build their own cognitive tools, as well as their external realities. Knowledge and the world are constructed and reconstructed through experience and are not merely commodities to be transmitted. Their common objective is to foster learning so that people outgrow their current view of the world, and construct deeper understandings about themselves and their environment.

Piaget and Papert define intelligence as adaptation - the ability to maintain a balance between assimilation and accommodation. They see psychological theories as attempts to

model how people handle such difficult balances. Piaget's interest was in the construction of internal stability, whereas Papert was more interested in the dynamics of change. Papert believed in 'diving into' situations rather than looking at them from a distance - becoming one with a phenomenon and applying empathy to the service of intelligence. He was concerned with how different people think once their convictions break down and expanding their current view of the world becomes necessary. Papert's 'child' is relational and likes to get in tune with others and with situations and learns from personal experience rather than from being told. Only when a learner has travelled through a world, by putting on 'different shoes' can a meaningful dialogue begin.

Both 'dwelling in' and 'stepping back' help learning through cognitive dissonance. According to Kegan (1982), human development is a lifelong attempt on the part of the subject to resolve the tension between getting embedded and emerging from embeddedness. Cognitive growth is an attempt to form and constantly reform some kind of balance between change and continuity.

Papert's work on constructionism is particularly important to 'Theatre of the Imagination' because of its active engagement with making and with change. My research is seeking to develop the agency of children to bring about change in schools and generational change in behaviour related to society and the environment. I believe that engaging at the local level can help change the attitudes and behaviour of children in primary schools if the context and environment are receptive to values fostered through global citizenship in contrast to the current, heavy-handed, culture of division.

2.5.2 Overview of the educational approaches

Research undertaken by the Royal Society of Arts (Astle, 2017) flags up current issues and feelings around primary education. One dilemma is the importance of numeracy and literacy, which is set against subjects that are not subjected to national tests in mainstream education. The impact of reduced investment in mainstream primary schools, in real terms, is teachers leaving the profession, or moving to the private sector, and not being replaced. The secondary impact is that subjects not measured are afforded less time:

Literacy and numeracy are fundamental. They provide the foundations on which all other academic enquiry stands. Without them, a child cannot access the broader

secondary curriculum – the natural sciences, humanities and the arts – that is their right. For it is within these disciplines that they will develop a fuller understanding of themselves and the world in which they live, and by doing so, enter into the ‘great conversation of mankind’.

(Astle, 2017, p.47)

The polemical debate about the purpose and character of primary education rages on. These are divided, unhelpfully, into two approaches with minor variations: education to develop skills, capabilities and character through student-led, project-based learning; and education that seeks to expand student knowledge and cultural literacy through instruction. The Education Endowment Fund (EEF) suggests that teachers should strike a balance between didactic instruction and independent enquiry to ensure that students develop knowledge and skills. Peter Hyman (Astle, 2017, p.45) explains:

At School 21 ... many of our teachers do more direct instruction and lectures with PBL [project-based learning] – to ensure the knowledge is properly understood – than they did previously. PBL is a series of techniques rather than one method of teaching. And we do not promote skills over knowledge.

Cognitive psychologists, such as Meyer and Land (2012), believe that there is sufficient research evidence to make any reasonable person sceptical about the benefits of discovery learning (PBL) and they believe that the constructivist view of learning may be best supported by methods of instruction that involve cognitive activity rather than behavioural activity, instructional guidance rather than pure discovery, and curricular focus rather than unstructured exploration. ‘Theatre of the Imagination’ includes methods of instruction that involve cognitive activity alongside discovery learning supported by skills development. Knowledge and skills are fostered in tandem, as is the case with many schools engaged in nuanced variations of discovery learning, such as project-centred learning (Orr and Shreeve, 2018). The current debate concerning knowledge or discovery tends to entrench well-meaning people in opposing camps and this irony is highlighted by the fact that cognitive acceleration develops through cognitive dissonance. Meyer et al. also suggest that there is a consensus in cognitive psychology that it takes knowledge to gain knowledge. But it is

equally important to consider the limitations of cognitive science (Willingham, 2013). Willingham explains why, like the bureaucratic instinct to measure educational outcomes, science can only take us so far towards the essence of education. He reminds us that the prerequisites for the application of the scientific model are that it needs to be something from the natural world and it needs to be something that you can measure in some way. You cannot undertake scientific method in the absence of measurement and therefore lots of things fall outside the view of science in education. Education, on the other hand, sets out to change the world by equipping students with the tools they use to realise their vision of what the world could be like and this is beyond the scope of science. The objection to teacher-led education was summed up by John Dewey (1938, p.19):

Theirs is to do – and learn. ... Learning here means acquisition of what already is incorporated in books and in the heads of the elders. Moreover, that which is taught ... is taught as a finished product, with little regard to the ways in which it was originally built up or to changes that will surely occur in the future. It is to a large extent the cultural product of societies that assumed the future would be much like the past, and yet it is used as educational food in a society where change is the rule.

Hyman (School 21) shared the concerns of Dewey in an interview with Astle (2017):

Regimentation and compliance is the way of getting people through a system they don't enjoy. So, more schools opt for the silent treatment. Silence in corridors, silent classrooms, stricter rules. Detentions are regular and relentless for those who transgress. ... Authoritarian regimes also lead to unthinking young people, afraid to question authority, even when that authority is heading off the rails.

2.5.3 The antithesis of government-funded research

The EEF (2017) research report on the benefits of the arts in primary schools stated that its findings have low security and therefore require further research. The report goes on to propose that the arts are important 'in their own right' and that students who gain a mastery may discover their life's passion. In 'Theatre of the Imagination' workshops, design and making help to connect the arts, mathematics and science and provide pedagogies that harness innovative thinking. A discordant and cynical note is struck when budgets for

mainstream education are being cut in real terms and many teachers feel they are being undermined by the imposition of metrics which ignore research that does not support the dominant political view.

Tough (2012) argues that the problem for students from low-income backgrounds is a relative lack of resilience, perseverance, self-discipline and self-confidence and not a lack of learning power. Hirsch (2013; <http://educationnext.org/primer-on-success>) explains what he sees as the key intellectual flaw in Tough's argument:

The critical missing element in Tough's otherwise informative book is the phrase 'other things being equal'. He effectively shows that people who have more grit, character and persistence will succeed better than those who have less, other things being equal.

Hirsch suggests that knowledge and vocabulary are the 'other things' that are required to make other things equal. He adds fine motor skills and, in third place, non-cognitive features. The ranking of these aspects of learning as a universal order of things comes into question because there can never be agreement on the political construct of 'universal'. What is agreed, by many on either side of the epistemological divide, is that cognitive and non-cognitive factors are important in education. An emphasis upon the scientific conclusion is founded upon what has been selected, by whom, and how it is defined.

Constructivism nurtures a holistic education that attends to each child's head, heart and hand, with teaching methods carefully selected to develop not just knowledge but an interest in gaining knowledge through cultivating skills, capabilities, attitudes and character strengths that address complexity as an antidote to overly simplistic debates or the imposition of a narrow body of knowledge.

2.5.4 Accelerating learning through the arts

Accelerated learning is an intensive method of study which enables material to be learnt in a relatively short time. The Social Mobility Commission (2014) established a summary of key factors that schools should consider when supporting disadvantaged students and to accelerate learning. Their research established that a lack of cultural and social values and resources, along with weak non-cognitive skills, were key contributors to poorer outcomes. Primary schools seek to broaden ambition and build upon student experience, not just for those with low ability, as there are high attainers who are underperforming, and current data does not always tell an accurate or reliable story.

Headteachers in primary education have contributed to findings emerging from the Education Endowment Foundation Toolkit (2012) for teaching and learning, which is a summary of international evidence on teaching five- to 16-year-olds. School leaders invariably refer to these findings when making decisions concerning the allocation of income, such as pupil premiums. The EEF Toolkit indicates that increased arts participation has a low impact compared to other approaches but also concedes that learning gained from arts programmes is not straightforward and needs further exploration (See and Kokosaki, 2015, pp.9–12). Six approaches to teaching and learning are highlighted in the EEF framework (**Figure 2.2**), related to primary education (2017). ‘Theatre of the Imagination’ embraces all six methods and questions the veracity of findings that suggest the low impact of arts participation, which, in the EEF report, is narrowly and inaccurately defined.

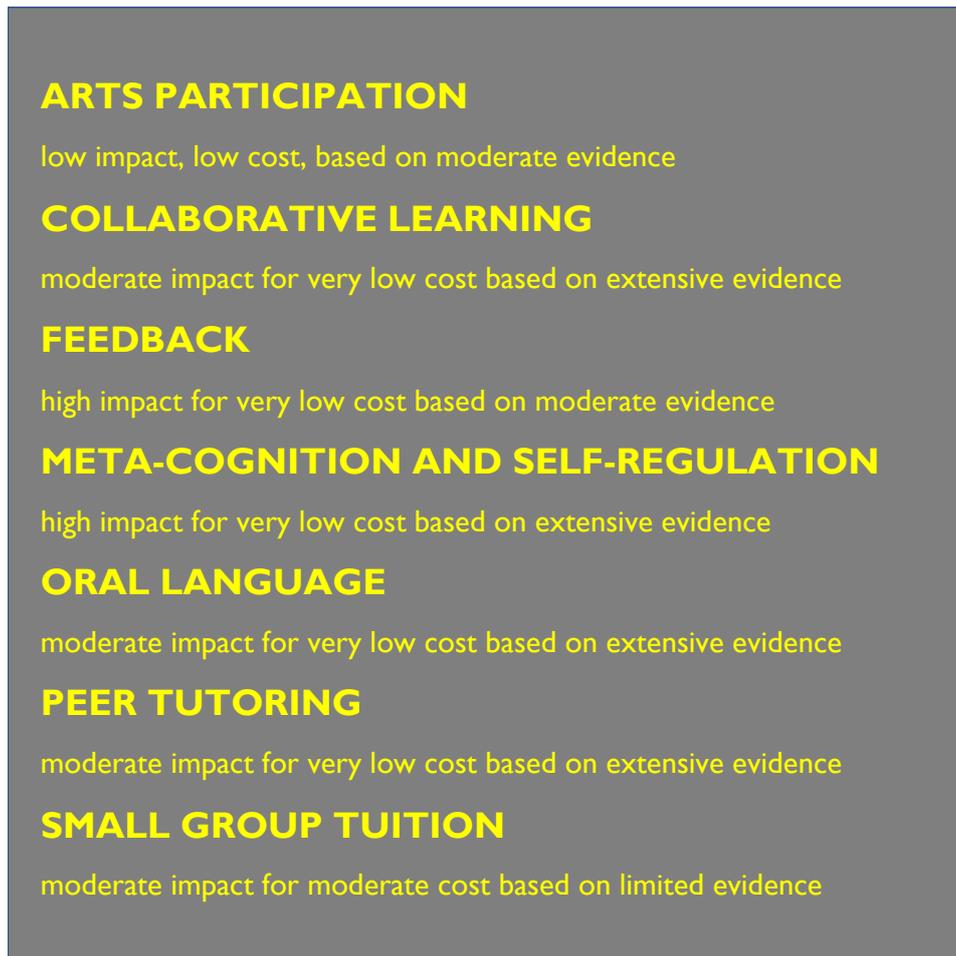


Figure 2.2: Seven approaches to learning highlighted in the EEF framework (2015)

The report questions how pupils can be encouraged to apply their learning through arts participation to more formal contexts. ‘Theatre of the Imagination’ sets out to demonstrate the value of creative practice in areas the EEF highlights as being of ‘high gain’, including: feedback, metacognition, peer tutoring, oral language intervention and small-group tuition. Their definition of visual arts is narrow and does not illustrate how signature pedagogies in art and design can develop knowledge and skills in tandem across the curriculum.

Hargrove (2011) reports that there is little indication that deliberate creative thinking strategies are being taught at tertiary level, let alone primary level, and holds that deliberate training in creativity is rare in the US and UK. He advocates a metacognitive approach to help designers think strategically to help improve explanation and interpretation, application and perspective, and empathy and self-knowledge. Lewis (2005) suggests that there is some way to go before creativity becomes a core feature of the teaching art and design and therefore, for creative behaviour to be a central theme in

education from primary to tertiary levels, new pedagogical approaches might be productive. What is unknown is whether primary school children are able to develop and apply creative practice as a metacognitive strategy and whether or not this helps to foster agency and self-regulation. Does the cognitive nature of design allow it to be transferred across levels and can an effective skill set support creative thinking and practice?

explanation and interpretation	application and perspective	empathy and self-knowledge
developed reflective revealing nuanced	skilled competent insightful self-efficacious	sensitive sees situations circumspect self-regulatory
intuitive reflective perceptive instructive	able limited strategies considered thinks critically	helpful empathic thoughtful aware of 'other'
basic superficial literal borrowed	novice needs coaching single perspective No alternatives	egocentric little empathy innocent un-self-regulatory

Figure 2.3: Adapted from Hargrove’s rubric for metacognition (2016)

Hargrove’s (2011) research determined the positive impact that selected instructional interventions, based on metacognition, had on undergraduate students (**Figure 2.3**). His rubric outlines the factors that support the development of creativity in undergraduate students: explanation and interpretation, application and perspective, and empathy and self-knowledge. ‘Theatre of the Imagination’ sets out to establish whether Hargrove’s rubric can be applied to primary education through design and making.

Hargrove (2015) suggests that creativity appears as a taught module in education and business but is less common in faculties of art and design, where it has been considered an

integral part of studio practice learnt through a kind of dialogic osmosis during the 'crit'. He believes that developing explicit knowledge of creative methods and developing skills to support creativity through abductive thinking are not mutually exclusive. Hargrove explains that design is a sequential process of description and redescription, and designs are transformed through a visual and mental transaction between the designer and the representation in which reflection upon that visual representation becomes a series of actions, resulting in transformations as the idea emerges.

The model of re-representation is highly relevant to theories of creativity in design. Cross (1990) describes design as an exploratory, rhetorical, emergent, opportunistic, reflective and risky endeavour. He suggests that it is expected that design institutions will develop these attributes in their students. A starting point for this transformation is the cognitive processes that students naturally go through in exploring problems and Hargrove has found that strengthening metacognitive skills improves thinking about and practising design in students. Teaching children to explore their own cognitive processes in a systematic way may help to develop design thinking skills (Noel, 2017) alongside metacognitive knowledge. Identifying 'drawing, making and telling' as cognitive processes may also provide the scaffolding for an educational model that fosters agency and self-efficacy when exploring the global goals. Evidence for these attributes is sought through the workshop case studies.

Hargrove stresses the importance of self-evaluation as a metacognitive skill which supports creative thinking, which is the basis for developing the 'pre' and 'post' self-evaluation questionnaire for workshop participants. Paying attention to thought processes and taking responsibility for thinking may encourage children to reflect upon how to apply their strengths to generate design ideas (Nickerson, 1999). Schön's (1993) seminal work on 'reflective practice' in which a designer has a 'conversation' with the situation can, according to Hargrove, be classified as self-regulatory metacognitive thought. Schön's work underscores the idea of encouraging children to discuss thoughts in duets and quartets around their projects.

I set out to nurture concurrent reflection on creative skills (reflection-in-action) and to encourage rethinking outcomes in collaboration with peers (reflection-on-action), to discover how creative practice may nurture agency through metacognition.

2.6 Transition Design

The first European Transition Design Symposium, which took place at Dartington Hall in June 2016, brought together designers, academics, environmentalists, performance artists, social entrepreneurs and economists to discuss a series of presentations on social, economic and environmental issues. The symposium was jointly organised by academics from Schumacher College, Devon, and academics from Carnegie Mellon University, Pittsburgh. Transition design has a distinct advantage over some other approaches to societal transition as it provides a continuum which embraces service design and social innovation (Irwin et al., 2015). A counterargument is whether such a broad span of methods promotes a superficial engagement with theory. Rogers and Bremner (2017) propose that design is an alterplinary activity that provides a flux between disciplines and traverses many theoretical territories to make and find new connections. Dilnot (2017) celebrates such an approach to conceptual thinking, which he refers to as vulgar theory, 'like a check suit', because it deconstructs traditional territories and fosters new thinking.

A legitimate concern within any research environment is to ensure the establishment of a countervailing voice and the encouragement of disruptive interventions. Such a climate of testing and questioning helps to ensure hegemonic tendencies are confronted. In the case of transition design, direct opposition exists in the form of the dominant social, political and economic model and through its transdisciplinary nature, which actively seeks out a multiplicity of discourses (Irwin, 2015). Ezio Manzini (2017) suggests that resistance can take place through the formulation of counterproposals and the construction of legitimate alternatives, and suggests that designers are well positioned to explore these.

Transition design is an area of design study, research and practice that builds upon the established subdisciplines of design for service and design for social innovation. 'Theatre of the Imagination' calls upon aspects of this spectrum of related approaches by positing a long-term research aspiration to help develop a new paradigm for mainstream primary education that challenges the current curriculum. Social innovation, according to Manzini, often embraces a process of co-design in which designers work as facilitators and catalysts within transdisciplinary teams. There is a growing consensus of opinion that design can be a mode of innovation that provides a set of skills, tools and methods that guide people to new solutions or improvement of existing ones (Emilson, Seravalli and Hillgren, 2011).

Irwin (2015) believes that transition design takes service design and design for social innovation further because its aim is to develop radically new socio-economic and political paradigms. Irwin shares Manzini's commitment to design-led societal transition and the re-conception of lifestyles. Manzini calls for a democratic rebalance between freedom and equality through cosmopolitan localism, a place-based lifestyle in which solutions to global problems are designed for local, social and environmental conditions. In this research study, workshops are designed to introduce mainstream primary children to practices that help promote the 'student voice' in the context of social and environmental issues impacting upon future generations. Transition design helps to frame the research by promoting change, by adopting a posture of social equity, and by fostering design thinking through making. The concept of transition is central to a variety of contemporary discourses and initiatives within academia, non-profit organisations, and community sectors which are often disconnected and unrelated to the field of design. The following transition design discourses, as proposed by Tonkinwise and others, help to map out common ground shared in 'Theatre of the Imagination':

'Living systems theory' explores phenomena in terms of dynamic patterns of relationship and what Geels (2002, pp.1257–1274) describes as the multi-level perspective. He defines three overlapping perspectives:

- Macro factors impact upon the sociotechnical landscape. The changing landscape puts pressure on the status quo and creates 'windows of opportunity' for innovation. Primary education is under duress because of underfunding, a contested curriculum and a shortage of teachers. The effectiveness of the creative arts has been brought into question in recent research into the impact of arts education on learning in primary education (Education Endowment Fund, 2017).
- Niche innovations feed into small networks to support change. Learning processes are co-constructed, and efforts are made to link elements of the new proposition to influence the wider landscape. 'Theatre of the Imagination' transfers pedagogies from tertiary education to mainstream primary education.
- Current situations, in which the sociotechnical environment is relatively stable, take on new configurations through niche innovation and adjustments occur in the landscape. Halstow School have adopted the global learning goals as a theme to

connect subjects in the KS2 curriculum. The Royal Danish Academy of Fine Arts (<https://kadk.dk/en>) have made engaging with the UN global goals an aim in all degree programmes.

‘The Winterhouse Matrix for Social Change’ illustrates how incremental steps related to scale of change and the range of actors involved have been re-envisioned and communicated to participants and schools in the ‘Theatre of the Imagination’ network with an interest in supporting design thinking and making in primary education.

‘Cosmopolitan localism’ describes a place-based lifestyle in which solutions to global problems are designed for local circumstances and globally connected in their exchange of information. Manzini’s contribution to the transition design curriculum at Carnegie Mellon is, in part, through his work on cosmopolitan localism which embraces diversity through active feedback and continuous experimentation. He describes this as the meta-culture of a society in which diversity flourishes and in which places and communities are not isolated but become nodes in a multiplicity of networks. ‘Theatre of the Imagination’ emerged from exchange projects with India and Mexico and through local and regional exchanges across primary schools. These project exchanges were intended to provide tentative steps towards the development of a ‘Blueprint Exchange’ network (**Appendices one, p. 189; three, p. 219; and four, p.217**).

Transition designers believe that there is a crisis of perception, ‘a reductionist world view’, inadequate for understanding the nature of complex systems. Capra and Luisi (2014) believe that a shift to a more holistic world view is one of the most powerful leverage points for transition to sustainable futures. An alternative system of primary education which embeds design thinking may help to nurture a new paradigm in mainstream schools. ‘Theatre of the Imagination’ sets out to provide a space for good discussions and to cultivate ‘care-full’ and playful learning methods. Irwin promotes ‘transdisciplinarity’ as a holistic conceptual framework that goes beyond the narrow scope of a local world view. She believes that some questions are best approached by combining the methods and techniques of one discipline to help pose and answer questions generally associated with another. Turning the lens of creative practice onto the field of primary education may create a new transactional analysis, where students are encouraged to become independent learners and can, at times,

take the lead in decision-making. This may help to define a space for design as a flux for other subjects including literacy, numeracy and science in primary education (Cross, 1979).

2.6.1 The transition design framework

The transition design framework promotes interconnections between vision, models of change adapted from strategic management theory, the need for reconceptualising the potential of primary education, and new ways of exploring the UN global goals across geographic space (**Figure 2.4**). Transition design outlines mutually reinforcing areas of knowledge, action and self-reflection. These areas are: vision; theories of change; mindset and posture; and new ways of designing.

Vision

Tonkinwise et al. (2015) argue in favour of motivating visions that can serve as measures against which we can evaluate design moves – and visions that are modifiable according to changing situations. This requires participants to suspend disbelief and wonder about how things could be. This type of visioning is an iterative process used to generate new ideas for the future that serve to inform even small, modest solutions in the present. Manzini and Jegou's 'Sustainable Everyday' (2003) is based on answers we can conceive of today concerning the future. 'Theatre of the Imagination' proposes a future scenario which transfers creative pedagogies into primary education to cultivate social innovations, delivered in physical and digital studio workshops. As creators of models, prototypes and propositions, children contribute to a dialogical space and plan for a common good.

Theories of change

According to Irwin et al., this is a key area of the transition design framework for three important reasons:

- A theory of change is a prerequisite for a planned course of action.
- Transition to a more responsible future will require change at every level of society.
- Our outmoded ideas about change lie at the root of many wicked problems.

Discoveries from fields such as physics, biology, sociology and organisational development have revealed that change within open, complex systems is manifested in counterintuitive ways. Although change within such systems can be catalysed and gently directed, it cannot

be managed or controlled, nor can outcomes be accurately predicted (Capra & Luisi, 2014). 'Theatre of the Imagination' takes seriously Gardner's (1999, p.180) idea that children have different kinds of intelligence and what is considered valuable needs to reflect diversity within a transition design primary school network.

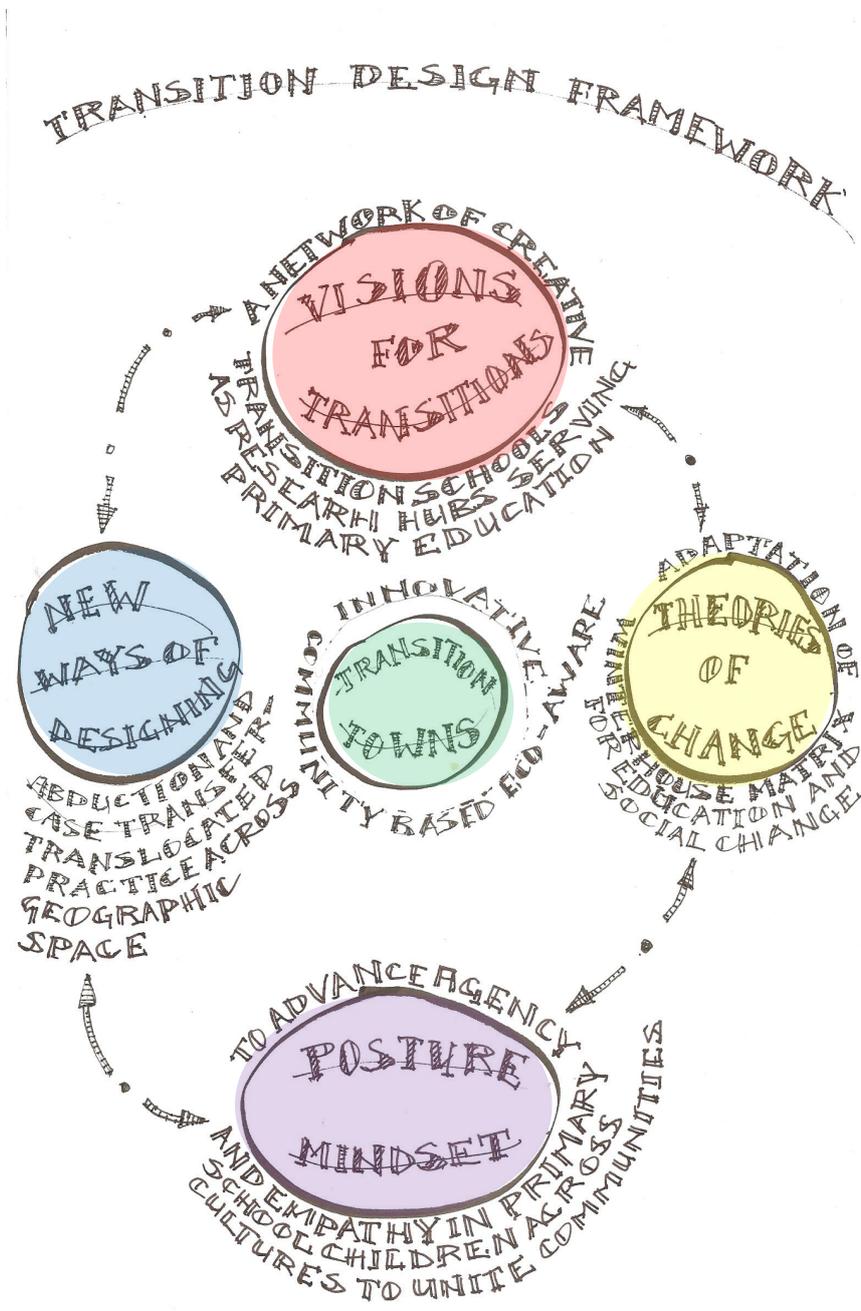


Figure 2.4: potential for a transition design primary school network

Posture and mindset

Changing a mental state and position requires a macro account and reason to think and act differently:

Ultimately, these (systematic) problems must be seen as just different facets of one single crisis, which is largely a crisis of perception. It derives from the fact that most people in our modern society, and especially our large social institutions, subscribe to the concepts of an outdated worldview, a perception of reality inadequate for dealing with our overpopulated, globally interconnected world.

(Capra and Luisi, 2014, p.xi)

The current education system, based upon competition for scarce resources, is part of an incoherent impasse. David Kynaston (2019) explains:

Consider these three fundamental facts: one in every 16 pupils goes to a private school; one in every seven teachers works at a private school; one pound in every six of all school expenditure in England is for the benefit of private-school pupils.

Our democracy is rendered a sham under these archaic conditions.

New ways of designing

Transition designers develop a vision of 'the long now' (Brand, 1999) and view a design proposal as a single tentative step in a longer journey that may be reversed with minimal trace. Critics of transition design argue that visions of what life might be in, for example, 2030 may delay important changes that are needed today. Proponents of social transformation share a belief that design can be adopted as a vehicle for political and social activism through multiple, iterative interventions over time. Critics such as Norman (2010) question 'design' as a solution to an unsustainable state of global political, social and economic systems because designers are woefully undereducated for the task. The adapted Winterhouse Matrix (2017) addresses these concerns.

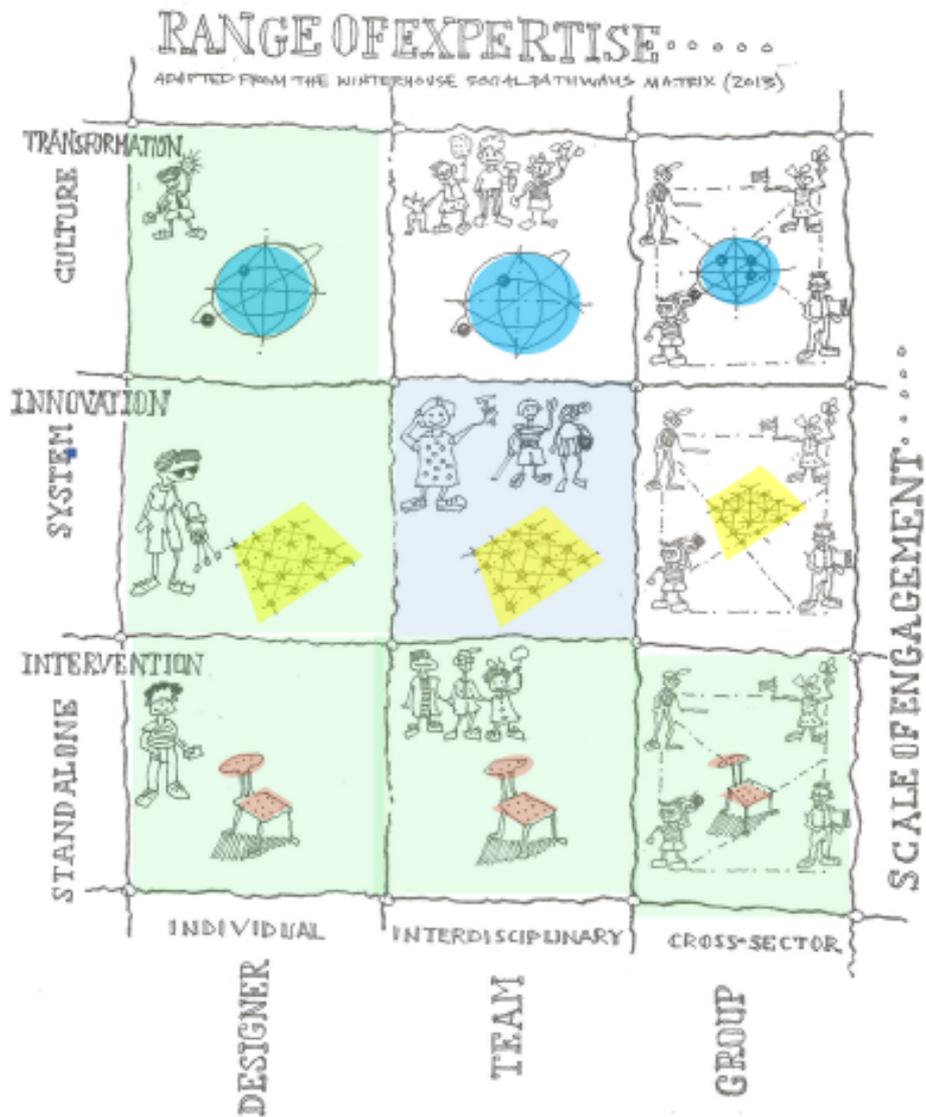
2.6.2 The Winterhouse Matrix

A long-term goal of 'Theatre of the Imagination' is to construct a primary school network that aims to change our perception of design in schools and what is possible through

collaboration. History has shown that meta-level sociotechnical change can be achieved through incremental and small-scale interventions.

Transition designers in the US provided the model for planning and organising incremental steps for design and making as a method for changing mindsets and policy in primary education in the UK. 'Theatre of the Imagination' workshops are conceived to be an important first step towards a long-term vision of translocated learning and research aimed at developing the voice of children locally and fostering a good conversation globally. The Winterhouse Matrix provides a framework to assist the construction of a map for others to follow who wish to engage with the project, or for those who would prefer to develop their own creative toolkit for primary education (**Figure 2.5**). This approach may help to build the 'Blueprint Exchange' network of ideas for the creative toolkit designed to help explore the global goals through design and making.

The Winterhouse Matrix provided the researcher with a transition design model for planning and organising incremental steps, through practical workshops, to foster agency and to help nurture compassion in primary education. The workshops are conceived to be a step towards a longer-term vision for an international network of transition design schools in mainstream primary education.



1. study begins with me as a stand alone individual designer
2. 'Learning Circles' help transform the study into an interdisciplinary endeavour
3. working between HE and primary education helps make the study cross-sector
4. applying a CLD approach nurtures system innovation and creative exchange
5. working across geographic space may help foster cultural exchange

Figure 2.5: Winterhouse Matrix process for 'Theatre of the Imagination' (2017)

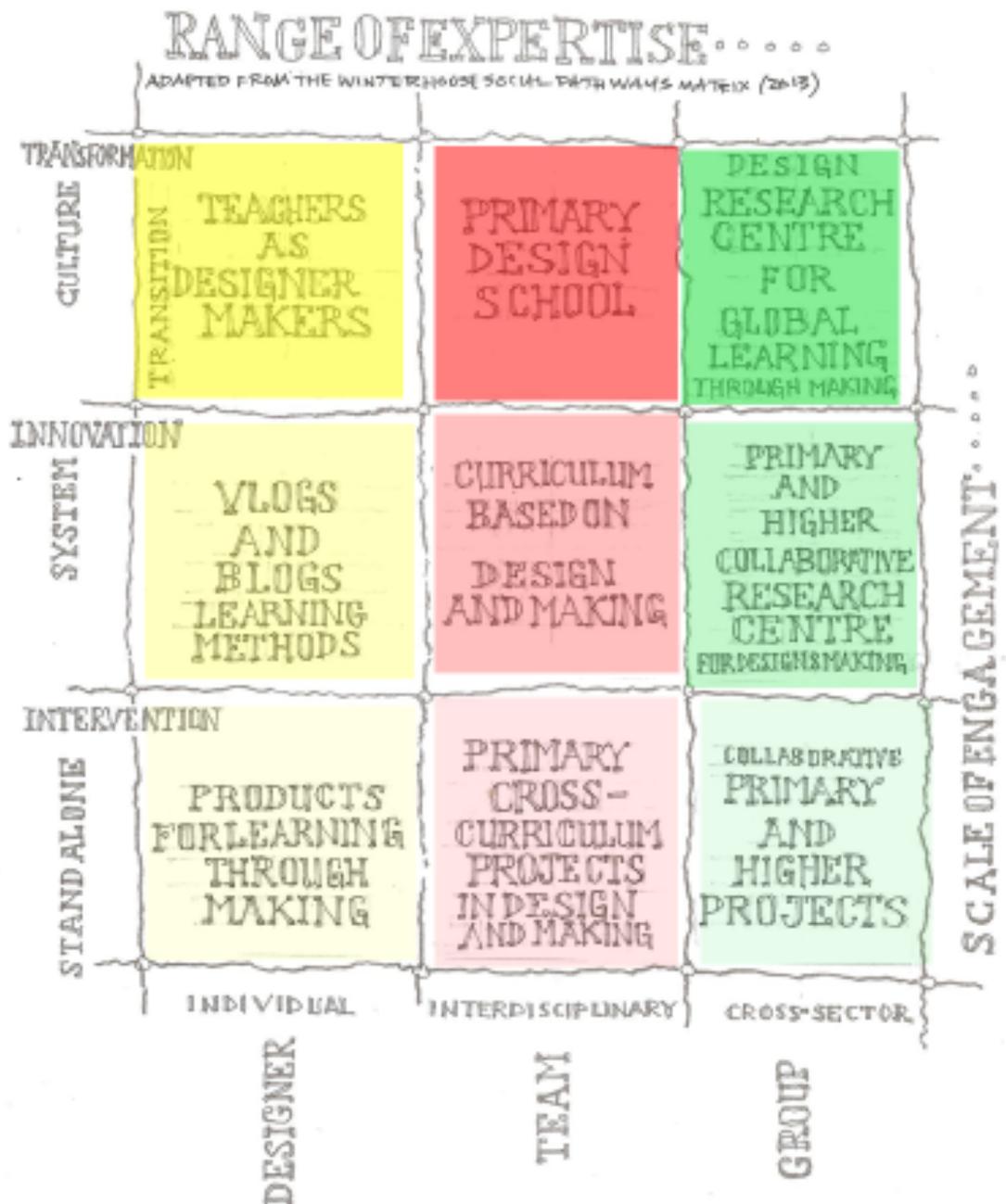


Figure 2.6: Winterhouse Matrix initiatives for ‘Theatre of the Imagination’ (2017)

An incremental model such as the Winterhouse Matrix may help the researcher to plan and organise the development of design education in primary schools, beginning by generating ideas for a single project, to a systematic approach for exploring the UN global goals across geographic space (creative toolkit). Each initiative is designed to change the perception of how design thinking and making can help to connect subjects in the curriculum and develop

the scale of collaboration within a school and between schools. It also serves as a model to help researchers and teachers to build an independent and customised version of 'Theatre of the Imagination' in their school.

2.6.3 Blueprint Exchange

A network is defined as 'a group or system of interconnected people or things' and the definition of a blueprint is 'something which acts as a plan, model, or template for others' (Oxford English Dictionary, 2018). The concept of 'Blueprint Exchange' was first mooted in 2012 as a research process for developing artefacts and stories created by primary school children through a series of co-design projects facilitated by researchers in India, Mexico and the UK. The original purpose of collaborating with researchers and children across geographic space was to share local stories concerning everyday life across three continents (**Appendix 1, p.189**).

In 'Theatre of the Imagination', the purpose of 'Blueprint Exchange' was modified and became the starting point for developing an open-source website for children and teachers to share stories, artefacts and declarative knowledge about responsible stewardship, in order to foster empathy through creative practice. The plan was to incrementally build a creative toolkit to enable members of the network to navigate a pathway through the Winterhouse Matrix to a global research centre for creative practice in primary education. The vision of an international network of schools remains a research ambition in its infancy.

2.7 Global citizenship

United Nations Secretary-General Ban Ki-moon (2012) declared:

We must foster global citizenship. Education is about more than literacy and numeracy. It is also about citizenry. Education must fully assume its essential role in helping people to forge more just, peaceful and tolerant societies.

Globalisation and global citizenship represent subjects of controversy among academics, activists and policymakers at all levels. Lagran (2016, p.2) observes that the meaning of these concepts is debated, academic institutions offer related courses, activists question the value of global citizenship, and politicians argue about the scope of global learning goals. At the heart of this debate are factors related to the political, economic, social and cultural realms

that are part of how we view globalisation and its possibilities. Some critics emphasise the negative impact of globalisation on the environment and communities and others consider it a source for wealth and progress.

Global citizenship invites similar dissonance as there are commentators who have faith in its ability to address global problems and view it as the only viable solution to save the world from war and environmental destruction. On the other hand, there are those who see global citizenship as imperialist, a threat to state interests, and a contradiction in terms – if citizenship is defined by states, how is it possible on a global level? One attempt at an answer to this was the development and publication in 2015 of the ‘United Nations Goals for Sustainable Development’, which provide a ready-made framework for design thinking and making in ‘Theatre of the Imagination’ workshops.

2.7.1 Global goals

In September 2015, the United Nations adopted seventeen Global Goals for Sustainable Development to achieve three things by 2030 (**Appendix nine, p.271**): an end to poverty; combatting climate change; and fighting injustice and inequality (**Figure 2.7**). These goals help set the values to build a more creative culture for learning and discussion and those that have figured highly in the workshops, selected to reflect current curriculum and school location in collaboration with teachers, include:



Figure 2.7: UN Global Goals for Sustainable Development

The decision to apply the global goals framework emerged from a learning circle discussion with teachers at Halstow School in 2014. Following the first ‘Theatre of the Imagination’ pilot workshop at the school, the arts co-ordinator and team leader of upper Key Stage 2 applied this framework as the theme for the whole Years 5 and 6 curriculum:

Children at upper KS2 are ready to ask and discuss difficult questions. This happens whether or not the school curriculum encourages children to discuss issues, so we bring knowledge and skills together from across the curriculum to explore these

questions in a creative way ... art, design and making provide inspiring ways for exploring complicated issues which have no single, right answers. I have found that it also helps to set the right tone – friendliness and caring for others.

Tunstall (2011) recommends we stimulate the adoption of a trans-modern value system and suggests that successful cross-cultural exchange helps to foster compassion. The UN Global Goals for Sustainable Development framework promotes a value system negotiated and agreed in 2015 by the 193 members of the United Nations General Assembly. The seventeen global goals are thought by some members to be too many, too vague or too prescriptive, too attached to an anthropogenic world view, too long-term, too individualistic and too celebrity-centred. Such criticism raises questions for debate related to what constitutes a desirable and feasible intervention in a local community, across generations.

There are also eminent scholars, politicians and world leaders who question the concept of sustainability and the ambition of the SDGs. Bremner explained his position in a discussion with me at Lancaster University and subsequently through the following email (2017):

... sustainability first erased stewardship, which had recognised that the infinitely possible went hand in hand with the infinitely responsible. Under stewardship, possibilities and responsibilities were continuous. Under sustainability, continuous consumption guaranteed that responsibilities, like packaging, were carefully disposed of.

‘Theatre of the Imagination’ raises concerns about the ‘unsustainable sustainable’ and encourages primary students to consider the pros and cons of the UN global goals. Discussing difficult problems in primary schools requires an articulate and respectful approach. Appiah (2015) explains that any discussion concerning creed and culture is possible if it is carried out in a respectful manner and he believes that good intention is the key. Kleinsmann and Valkenburg (2008) emphasise the importance of different actors within a co-creative process. Each actor can contribute specific knowledge to create shared understanding. This idea reflects Steen’s (2013) definition of co-design as collaborative design thinking in which all actors are stimulating the process. Steen suggests that co-design is a process of abduction or ‘something that may be’. Peirce (1931) explained abduction as something that has potential

to happen and contrasted it with deduction, which proves that something must be, and with induction, in which something is already operative. Prior experience indicates that when primary children depict their thoughts and ideas through drawings, models and stories they understand that their propositions are something that might be.

Dewey (1938) noted that knowledge should be concerned with exploring alternative futures. He promoted processes in which people are empowered to jointly reflect on their practices and experiences and to communicate and co-operate to improve their own or other people's situation. When he suggested that inquiry is the controlled or directed transformation of an indeterminate situation into a unified whole, he was describing, in part, what global citizenship aims to achieve.

2.7.2 Extending a global view on learning

Oxfam promotes 'Education for Global Citizenship' (2015) because children, they suggest, are trying to make sense of a world marked by division, conflict, environmental change, extreme inequality, and poverty. Learners are entitled to an education that equips them with the knowledge, skills and values they need to create the kind of world that they would prefer to live in. Global citizenship, according to the research team at Oxfam, involves engaging with distant places and different cultures, but this is never undertaken in isolation from our own lives and communities. The focus is on exploring what links us to other people, places and cultures, the nature and equality of those relationships, and how we can learn from and about, those people and places. Such knowledge and skill are recognised as being essential in the twenty-first century.

Many teachers aspire to provide such an education, but it can be difficult to work out where to start in translating aspiration into everyday classroom practice. 'Theatre of the Imagination' sets out to provide practical creative learning tools to support mainstream primary school teachers in their endeavour. The intention is that members of the 'Blueprint Exchange' network can share new learning tools so that others can adapt these ideas and make a positive contribution to a more 'care-full' society (Rogers and Bremner, 2017).

2.7.3 The nature and impact of global learning

Research undertaken by the Development Education Research Centre focussed on the nature and impact of global learning on primary school children in England (Hunt, 2013). It identified factors which both encourage and limit global learning and explored how thinking at a global level can impact on children's knowledge, skills and values. Qualitative data was gathered via interviews with pupils in three schools at different stages of engagement with global learning. The study established a set of insightful and inspiring results, including:

- Global learning at primary level is strongly linked to awareness of other cultures and diversity and developing learners as socially aware, responsible global citizens.
- Global learning enhances pupils' awareness and interactions with diversity and can support mutual respect and responsibility.
- Schools that practise global learning include it in subject knowledge and curriculum content – particularly in geography, personal social and health education (PSHE) and citizenship.
- The role of motivated individuals is most important in enabling global learning in schools. Demand on staff time is identified as the biggest inhibitor to global learning.
- The large majority of respondents think global learning has had a positive impact in their school. Benefits to schools include enhanced community cohesion, school ethos and pupil voice.
- The inclusion of global learning in curriculum content, topic-based learning and certain award schemes are perceived to have a positive impact on pupils.
- Staff see global learning as having a positive impact on pupils' subject knowledge, skills and values.

'Theatre of the Imagination' encourages learners to think about other cultures and instigates discussions about what can be done locally to help conserve our shared global habitat. The belief is that knowledge and understanding, supported by thinking and making, can generate innovation and empathy. The research attempts to bring subjects together as instruments to help explore projects. Small-scale lifestyle changes are encouraged through

surfacing tacit knowledge and recounting personal stories in the belief that relating global issues to the way we live and think may help people to reflect upon their assumptions and their behaviour.

‘Theatre of the Imagination’ workshops are designed to test the new learning tools for exploring the global goals through design and making in primary education. The workshops test how these skills can be used to nurture new ideas and to determine if such ideas can help to shift ‘ways of being’. Nurturing responsible citizens who understand their own and others’ cultures with a developing sense of their place in the world is at the heart of my research investigation.

2.7.4 Contesting government-funded research

Ezio Manzini’s seminal work on design for social innovation informs all three theoretical strands of ‘Theatre of the Imagination’: design in mainstream education; transition design; and global citizenship. Manzini has extended his thesis on social innovation to include political factors related to design and democracy. His purpose is to encourage the rebalancing of freedom and equity through design-led activism:

Therefore, the emerging cosmopolitan localism can be seen as a creative balance between being rooted in a given place and community, and being open to global flows of ideas, information, people, things and money (Appadurai, 1990, 2001). A delicate balance. ... Nevertheless, when this balance is successfully achieved, it creates a new idea of place that, in our view, is very contemporary: a place that is no longer an isolated entity, but that becomes a node in a variety of networks where short networks generate and regenerate the local social and economic fabric, whilst long ones connect that particular place, and its resident community, with the rest of the world.

(Manzini, Design for Sustainable Culture, 2017, p.35)

‘Theatre of the Imagination’ sets out to address the concern that mainstream education is too narrowly focussed on league tables. The proposition is that primary children have the capacity to develop personal agency and understanding of who they are and of what matters to them. Weaknesses in the mainstream system reflect a wider concern about how

individuals work together to address pressing social and environmental problems for the common good. Transition design, through its focus on the future and social innovation, points to the need for incremental change in our policies for primary education.

A critical issue emerging from the literature review indicates that EEF research suggests the impact of arts education on learning is low. Findings are based upon research that overlooks design education altogether and ignores the fact that many teachers in primary education are not specialists in the arts. 'Theatre of the Imagination' workshops may suggest that this critical issue needs to be revisited for the benefit of children and society as a whole.

3.0 Methodology

The research methods I have selected are action-based. The systematic approach to prototyping, pilot testing, redesigning, re-testing, and disseminating calls upon signature pedagogies in art and design (**Figure: 3.1**). Learning circles provide a forum to discuss and review outcomes resulting from using the creative toolkit during the process of action research. Participants were invited to critique artefacts and videos emerging from the workshops and to consider how the creative toolkit, and the workshops, might be improved.

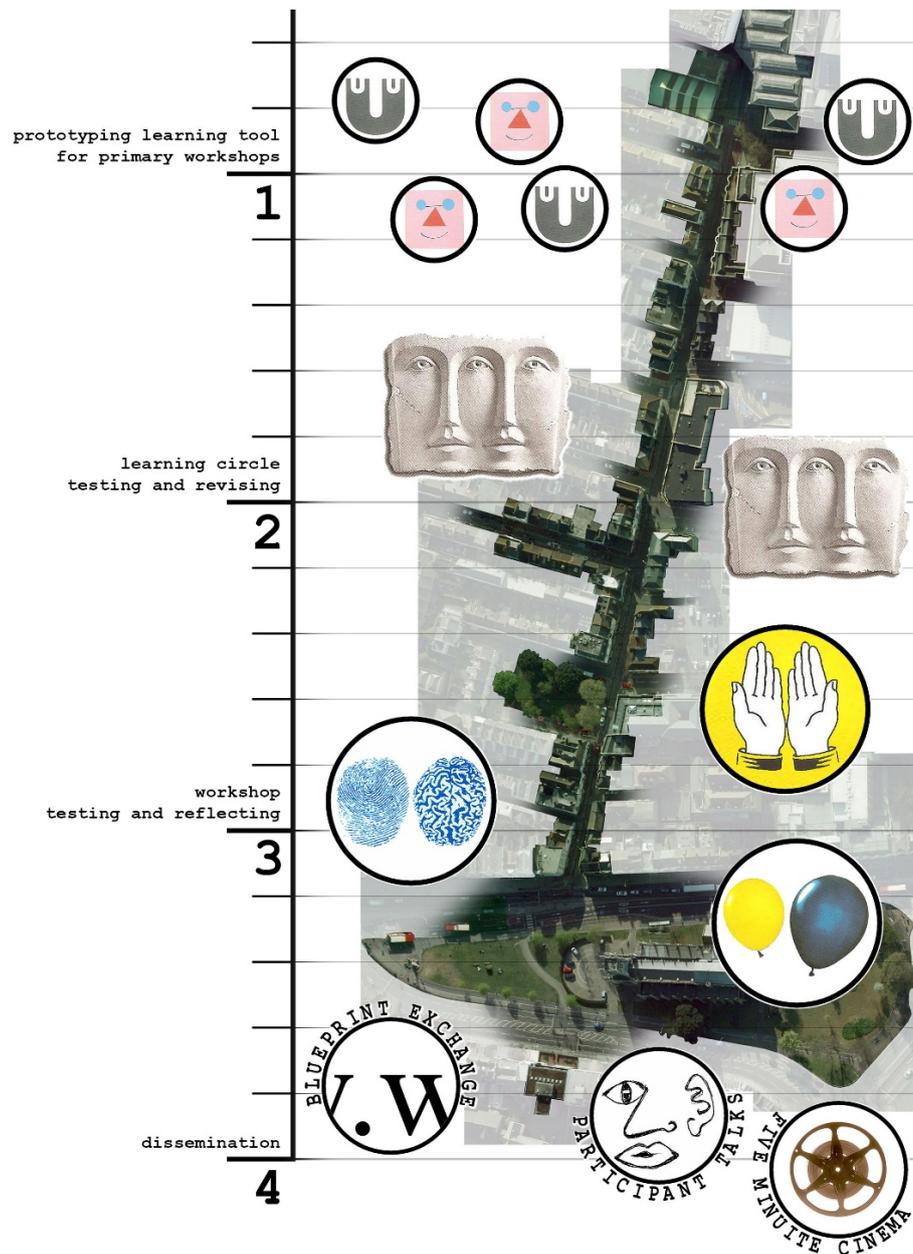


Figure 3.1: PAR method of developing and testing learning tools (Pulley, 2017)

3.1 Methods match motivation

The research utilises methods of data collection and analysis synonymous with constructivism. The analysis looked closely at visual narrative data emerging from the workshops, the pre- and post-self-evaluations by children, learning circle discussions, and field notes produced by me. This data was clustered around key themes: the development of personal agency in children; the effectiveness of art and design pedagogies and their relationship to metacognitive practices; and the UN global goals as a framework for fostering empathy and compassion.

3.2 The interpretivist paradigm

Interpretivism is a humanistic paradigm influenced by anthropology which aims to understand a culture from the inside. Interpretive knowledge of participants is normally produced through a process of interaction undertaken by researchers who immerse themselves within the culture they are studying. In the case of 'Theatre of the Imagination', this enabled me to build a rich local understanding of the life-world (Husserl, 1970) experiences of teachers and children and, to a lesser extent, the schools and the communities they serve. Such orientation pointed towards participant-centred research.

The interpretivist paradigm is about intersubjective knowledge construction through a process of interaction using ethnographic methods of informal interviewing, co-designing, participant observation and self-evaluation. When coupled with participatory action research (PAR) the methods help to provide 'symmetric reciprocity' (Heller, 1989) between children, teachers and me as the researcher. In response to the lack of generalisable evidence in such research, Guba and Lincoln (2007, p.25) developed standards of 'trustworthiness and authenticity' that are different from, but parallel to, the validity, reliability and objectivity standards of positivism. Collecting data from children, teachers and the learning circles is designed to foster such authenticity.

According to Guba and Lincoln, trustworthiness includes: credibility gained from immersion in the field to check interpretations with informants and to display a process of learning; engagement in open-ended or emergent inquiry; transferability and sufficient rich

description for the reader to compare their own social context with the social setting of the research; and confirmability to ensure research data can be tracked to its source.

Authenticity focuses on the ethics of the relationship established by me (**Appendix seven, p.250**) with participants to ensure informants are represented justly. These criteria are: educative, to ensure participants benefit by learning about their social world; catalytic, to ensure participants benefit by identifying issues associated with society and the environment; and tactical, to ensure the research empowers participants to improve their situation through action-based learning tools.

The interpretivist researcher reflects upon the influence of their own values and beliefs in interpreting the thoughts and feelings of other participants. Deep understanding requires a focus on the social, political, historic and economic forces shaping the pedagogies, curriculum policies and schooling system in which teachers are immersed. Kincheloe and McLaren (2000) suggest that by building upon the interpretivist paradigm it is possible to identify and transform unjust social practices and power imbalances.

This investigation is designed to explore the concepts of responsible stewardship of the planet and through a process of design thinking and making, to encourage children to critique the social and environmental state of things. I set out to raise consciousness in collaboration with children, teachers and others by adopting the role of a participant-facilitator in action-oriented inquiry (Reason and Bradbury, 2008).

3.3 Constructivist epistemology

The creative workshops are intended to actively prepare young people with social and cognitive skills so they may engage critically and imaginatively in ethical decision-making concerning complex issues facing society. Constructivism suggests that there is no such thing as an objective truth that can be measured or captured through research inquiry. In response to this, Charmaz (2003, p.250) suggests that the constructivist assumes the relativism of multiple social realities, recognises the mutual creation of knowledge by the viewer and viewed, and aims towards an interpretive understanding of meaning. Charmaz also suggests that data and analysis are created through an interactive process whereby the researcher and participant construct a shared reality. 'Theatre of the Imagination' aims to

enable the thoughts of children to be constructed as data through a combination of constructivist learning design (CLD) and an adaptation of the 'mosaic approach' (Clark and Moss, 2011).

3.4 Constructivist learning design

Constructivist learning design (CLD) helps to synthesise PAR and participatory design (PD). According to Gagnon and Collay (2006, pp.195–198), 'the researcher acts as choreographer, teaches basic steps and shares cultural traditions to organise the production'. 'Theatre of the Imagination's' adaptation of the CLD process (**Figure 3.2**) consists of seven stages which support an abductive and metaphorical approach to design and storytelling. Through CLD, teachers and pupils are encouraged to scrutinise the present to help create the future. Constructionist Seymour Papert (1993, p.181) advises that educational innovators use dynamic cultural trends as a medium to carry their educational interventions. Transition designers argue that a deeper understanding of what constitutes a sustainable future is the most relevant cultural trend for the next generation. This is supported by Manzini's ideas on design thinking for social innovation, which is both value-laden and forward-looking.



Figure 3.2: The constructivist learning design model (from Collay and Gagnon, 2006)

Reflection is added as a seventh stage of CLD to include the ‘learning circles’ as a forum for critical appraisals of students work. Each workshop has a detailed timetable reflecting the seven stages of the CLD event in which educational activities are designed to flow like a dance which children practise together.

3.5 Participatory action research

Participatory Action Research (PAR) builds on models of research and group dynamics developed by Lewin (1946), who coined the term 'action research' in his seminal work aimed at helping practitioners and researchers to jointly address social, political and economic problems. Borda (2011) suggests that action research challenges traditional social science by moving beyond knowledge developed by outside experts who sample a range of variables, to an active moment-to-moment reflection and inquiry occurring in a living, emergent community. According to Reason and Bradbury (1991), PAR has been promoting the use of strategies in which participants are actively involved as co-designers over many decades. Numerous object-based research methods foster reflection about our current world views, values and societal and economic models that are speculative, but are less oriented towards action and change than PAR sets out to be.

When applied in 'Theatre of the Imagination', PAR is based upon my experience and philosophy in collaborative research locally and globally (**Appendix 1**). Central to many descriptions of action research is the concept of a participative, collaborative approach to problem exploration, change and learning (Archer, 1995; Reason and Bradbury, 2011). I intend to exploit this flexibility by synthesising PAR, with its roots in social innovation, and constructivist learning design (CLD), with its roots in primary education, to promote personal and collective empowerment, as advocated by Manzini, who believes that design can help to highlight the complexity of the continuum between freedom and social justice.

Dunne and Raby (2013, p.92), the developers of speculative design (SD), are suspicious of the potential for hidden ideologies in design that can harm the public. But the idea of an agenda-neutral design process is considered impossible by design theorists such as Manzini (2015) and education theorists such as Robinson (2015). 'Theatre of the Imagination' has an explicit agenda to change policy in primary education and the range of artefacts emerging will differ from those emerging from SD as they are co-designed - not created exclusively by me - and the project is overtly activist in nature.

'Theatre of the Imagination' is based upon participation where outcomes are shared, worked through, reconfigured and discussed throughout the process prior to being exhibited in local schools and shared with partners. Dialogic exchange with members of

learning circles and members of primary school communities support the process of reflection through action. Concern that participatory action research can never be truly participatory and may serve to exploit is addressed to a significant extent through the common structure that the CLD approach promotes at its heart.

Dunne and Raby (2016) advocate 'the power of ambiguity', and this aspect of their work shares a common thread with 'Theatre of the Imagination'. They suggest that creating ambiguity and openness is central to creating tools of surprise to trigger other people to think differently and to trigger natural curiosity. But there is a significant gap between the value of abstract thinking and the intention to inform change through collaborative action. PAR and participatory design have their roots in movements dedicated to social change, including the Swedish trade union movement. Kurt Lewin's ground-breaking work related to action research was also directed towards social improvement.

An explicit intention of 'Theatre of the Imagination' is to foster policy change in mainstream primary education and to nurture independent learning and thinking. A question addressed in the creative workshops was whether primary school children have the aptitude to develop the cognitive and non-cognitive skills needed for co-designing and making in response to the UN global learning goals.

3.6 Symmetrical reciprocity

Bradbury-Huang (2015) linked organisational transformation through participatory action research (PAR) to the nature of change called for in sustainable development. She linked practices at the micro-interpersonal level with macro-institutional structures. Structuration of this nature, according to Bradbury-Huang, allows potent leverage points for change to become visible when change at the micro level shifts macro-dynamics through stakeholder engagement. Bradbury-Huang worked with Karl-Henrik Robert at MIT, where she set out to discover if participation and good conversation could create an architecture to support sustainable development that would engage leaders from the cultural and economic sectors. The process of action research that emerged became known as 'learning history' and this shares similarities with the 'learning circle' discussions I introduced to engage educators in 'good conversation'. Bradbury-Huang (2008, p.237) explains:

I wanted to write a jointly told tale in which the interviewees voices could not be overshadowed by mine. I wanted to develop a shared text for discussion among all the interviewees, as a form of feedback to the organisation, which would offer a basis for enfolding relevant theory for further generalisable conceptualisation. To be engaged in action research for me meant being involved in work that redistributed action and reflection among all people engaged in this challenge initiative concerning environmental education ... for the common good.

The combined PAR and CLD process helped in the transfer and testing of art and design pedagogies into primary education as a common good that holds the views of the researched and the researcher jointly into account (**Figure 3.3**). Navigating a difficult pathway that was mindful of local people, supported a process of co-design and afforded me the space and opportunity to act as co-creator and risk-taker suggests the creative toolkit fostered new ways of working and learning in primary education.

ORLANDO FALLS BORDA ON PARTICIPATORY ACTION

... IT SEEMED COUNTERPRODUCTIVE
FOR OUR WORK TO REGARD THE
RESEARCHED AND RESEARCHER,
THE TARGETS AND THE EXPERTS
AS TWO DISCRETE, DISCORDANT
OR ANTAGONISTIC POLES. RATHER,
WE HAD TO CONSIDER THEM BOTH
AS REAL THINKING FEELING PERSONS
WHOSE DIVERSE VIEWS ON THE SHARED
LIFE EXPERIENCE SHOULD BE TAKEN
JOINTLY INTO ACCOUNT... LOOKING
FOR 'SYMMETRIC RECIPROCALITY'...
FOR MUTUAL RESPECT AND APPRECIATION
AMONG PARTICIPANTS, AND ALSO
BETWEEN HUMANS AND NATURE,
IN ORDER TO ARRIVE AT A SUBJECT-SUBJECT
HORIZONTAL RELATIONSHIP

IN: THE HANDBOOK OF ACTION RESEARCH (2011)
CHAPTER 2, p. 30
EDS. PETER REASON AND HILARY BRADBURY
LONDON: SAGE

EZIO MANZINI'S BOOK, 'DESIGN, WHEN EVERYBODY
DESIGNS',
2015©
APPLIES PARTICIPATORY DESIGN
TO SOCIAL INNOVATION THROUGH
A COMBINATION OF 'DIFFUSE DESIGN',
'EXPERT DESIGN' AND 'CO-DESIGN',
TO SUPPORT SOCIAL CHANGE THROUGH
EMERGING FORMS OF COLLABORATION



Figure 3.3: Mixed methods applied in 'Theatre of the Imagination' (2017)

3.7 Student voice and social justice

James and Prout (2014) believe that theories of socialisation have viewed children as passive objects of social, biological and psychological processes and structures rather than as active agents. Traditional theories of socialisation do not take into account children's present-day views as legitimate subjects of study (Prout, 2005). Scholars from the field of the 'new social studies of childhood' have reframed children as 'competent agents' in the everyday social world who are capable of contributing to its transformation. Children are viewed as experts in their own lives and there is recognition that they may see different

issues to adults and see issues differently. James and Prout suggest that the views, everyday experiences and knowledges of young students should be researched directly and first-hand, while Morrow and Richards (1996, p.100) assert that respect for children's competencies needs to become a methodological technique in itself. Researchers concerned with understanding children's views are therefore drawn towards participatory action research (Kemmis and McTaggart, 2005).

I am committed to enabling primary students to be heard to help foster equity, as far as possible, in the context of the studio workshop. In recent years, arts-based educational research has flourished, making available many new forms of representation such as impressionist writing, autobiographical writing, storytelling, visual imagery, film and video, drawing and painting, prototyping and making. Interpretive and critical enquiries apply alternative modes of reasoning such as metaphorical thinking, dialectical thinking, abductive thinking, poetic thinking and reflective thinking (Taylor, Taylor and Luitel, 2012). Such creative methods stretched the imaginations of participants and my imagination.

3.8 Participatory design

Complexity begins with the need to foster an open, creative climate in the workshops, where knowledge of primary pedagogic skills is required at any given moment. Participatory design requires a constant cycle of 'giving and taking' in the form of planning, acting, observing and reflecting. Cultivating participation demands the 'ebb and flow' of reflection and knowledge generation through drawing, making and storytelling. The process of participatory design and making assemblages in collaboration with teachers, students and children also illustrates how this may be tested across geographic space with other schools. By paying close attention to participant views, PD may be a productive partner for PAR and foster Papert's ideas concerning constructionism (**Figure 3.4**).

The creative workshops are designed to promote collaboration with educators who have an interest in testing new learning tools. Sanders et al. (2010) define PD as a practice that involves non-designers in various co-design activities throughout the design process. Manzini and Rizzo (2011) highlight the importance of social innovation as the outcome of participatory design and suggest, "...it is a constellation of design initiatives aiming at the construction of socio-material assemblies where social innovation can take place". Foth and

Axup (2006) classify participatory design as immersive research in which participants are asked to critically reflect on their own behaviour and seek to collaboratively improve it through multiple iterations. They found that the purpose of PAR is to understand how a group interacts socially and to explore the circumstances of participants to create a richer picture. In the context of primary schools, a combination of PAR and PD enabled me to test the aims of the study and allowed sufficient flexibility to change the focus of an event and thereby maintain an open climate of innovation that responded to the ideas and preferences of children. Things ‘revised out’ were picked up in subsequent workshops, without significant disruption, to allow events to flow.

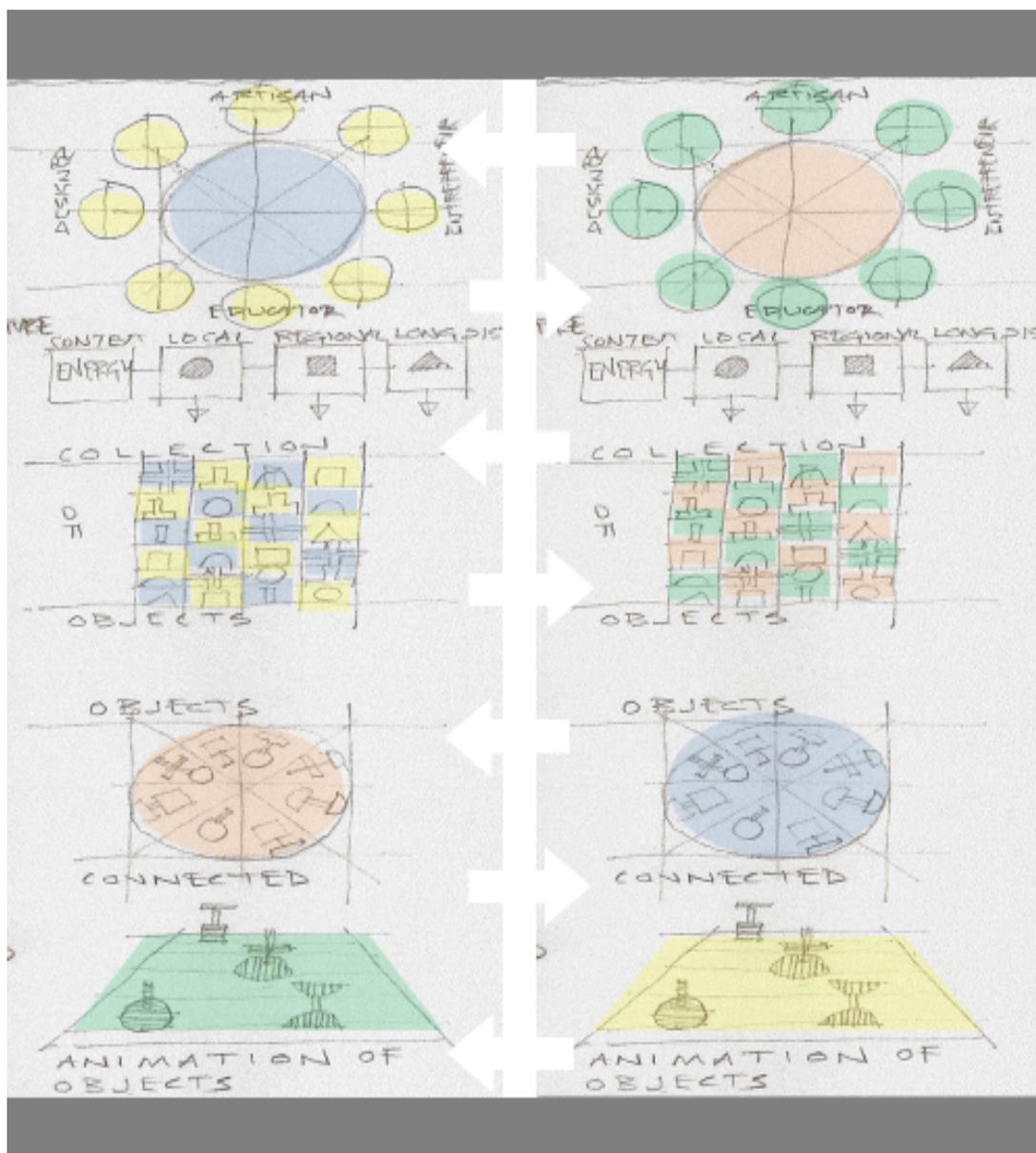


Figure 3.4: The process of synthesising PAR and participatory design

3.9 Potential weaknesses in methods of participation

As participatory development has gained importance, so critiques have grown in number. Cooke and Kothari (2001) warn of participatory development's potential for tyranny and the unjust and illegitimate exercise of power. They argue that development practitioners and organisations are not passive facilitators as they shape and direct the processes. The misuse of research methodology is not confined to PAR and it is reasonable to assume that misapplication of this nature is more likely to be noticed with the inclusion of teachers, practitioners and 'learning circles'.

An issue of concern raised by critics is the balance of time spent creating and appropriating new ideas and time spent caring for the lives of participants in the user group. It is important for design researchers to reflect upon their position and adopt an ethical understanding. The privileged nature of working with children, whose world view is culturally and contextually relative, can never be fully understood.

In 'Theatre of the Imagination', I engaged the support and knowledge of teachers, artists, designers and makers to help mediate and ensure the voice of participants and children was placed at the centre of our deliberations. My experience in working with postgraduate students and academic colleagues on collaborative art and design projects in the UK, India, Mexico and Spain helped to build a climate in which transactions between participants were based upon a culture of mutual respect and care for others in the process of co-designing.

Manzini and Rizzo (2011) highlight the focus that is given to big projects and believe participatory design can be equally relevant, or more relevant, to small local projects. The gains can be more direct and easier to assess with a portfolio of different tools. Researchers can help to make sure participants who take part in the process as non-professional designers have a greater say and become designers of their own reality as the lens is focussed upon the voice of children and teachers.

It is important to note that participant involvement does not guarantee participatory design (Iversen et al., 2012). Iversen underlines the importance of negotiating values. In many cases, participatory methods suggest that they deal with power divisions, while in fact they do not. Classroom management in primary education is beyond my experience and the

support of experienced teachers who shared similar values was crucial. Balka (2010) points out that outcomes of projects that are based on participatory design are seldom discussed and notes that information is shared informally during or after a project, but an analysis of the gains experienced by the participants is mostly lacking. 'Theatre of the Imagination' set out to address this weakness through the self-evaluation questionnaire and dialogic discussion with children and in 'learning circles' to help inform research findings for publication. Without a democratic focus, in which all parties are aware of issues of power-balance, there is no participatory design, so it was important to reflect upon when and how equal participation was achieved and to reflect upon moments when it was not.

Participatory design's emergence from Scandinavia through a culture of social democracy is unlikely to be congruent with the culture of all schools. The linguistic barriers between the researcher and participants is also an issue, as the diversity of students with different skills, and various stages of development, influences the level of collaboration and communication. Certain methods of communication may be ineffective and codes that influence flows of participation (Hussain and Sanders, 2012) need to be selected and tested with other approaches to hand and ready to use. Communication barriers can be prevalent locally and globally and ready access to a portfolio of strategies throughout the process was a key feature of successful participation. This was moderated by the involvement of teachers, other researchers, designers, artisans, governors, headteachers and teachers in residence from South Korea.

3.10 Participation in primary education

The workshops accessed children's representations of the world through participatory methods of communication and mutual respect. Primary students' ability to participate in research and to communicate their views may be dependent upon the social network available. Lee (2006) argues that children become more agentic as more 'actors' are added to their network. The methodological challenge for researchers collecting the views of children is to consider how competence is nurtured.

Prout (2005) holds that we are mutually dependent in social and research processes and therefore, to enable a process of knowledge co-construction, we must acknowledge that both children and adults are competent–incompetent participants in the research process.

He identifies several difficulties related to accessing young students' views: lack of time, lack of confidence, lack of skill in talking with young people, fear of losing control, anxiety about causing distress, and prejudice. I experienced such difficulties during my research, but these difficulties were not restricted to working with children and also applied to research with adults and discussions with colleagues.

The child's 'voice' is a product of social interaction and the process of accessing views becomes one that focuses on meaning-making rather than truth-finding (Dahlberg et al., 1999). It involves a process of co-construction between the research participant and the researcher and the process involves more than verbal and textual communication. Research interactions with children should be based on a respect for the unknowability of other people. There is a danger in trying to homogenise children's views or of seeking children's views simply to confirm established prejudices. Research which seeks to access the views of students involves relating with participants in a mutually dependent way, one that recognises commonality and honours difference. Alderson argues, 'To involve children more directly in research can rescue them from silence and exclusion, and from being represented, by default, as passive objects' (2001, p.142). The judicious use of participation can be an egalitarian experience for children and adults.

The 'mosaic approach' (Clark and Moss, 2005) was inspired by the work of the Italian preschools of Reggio Emilia (Cagliari et al., 2016). This approach encourages communication through a combination of participatory methods including taking photos, drawings and model-making in combination with traditional research tools of observation and interviewing. 'Theatre of the Imagination' adopts a similar portfolio of participatory methods and believes that what is needed in research with children, as in research with adults, is 'participant friendly' rather than 'child-friendly' methods. Christensen and James (2000) argue that the methods chosen should reflect the particularities of the persons involved and should be appropriate to the cultural context and appropriate to the research questions. Fostering personal agency is best served through diverse forms for presenting multiple voices.

Participant observation is a favoured approach in participatory research because the researcher seeks to join in with the activities as a familiar person while observing and

recording the interactions of participants and interpreting actions in context. The advantage of participant observation is that 'part of the agency can be shared with the child' (Clark et al., 2003, p.30). Postmodern understandings suggest that all observational accounts are a social and linguistic construction containing possible contradictions and provisional truths. Young students can be easily distressed, and are over-literal in interpreting the wording of questions. But young students can comment meaningfully about their experiences, thoughts and feelings when questioned, if the researcher recognises that the interview is a process of mutual construction of meaning.

Toys and puppets were used to engage participants in research conversations, along with images, sound, speech and video. When students have the support of their peers it may diffuse the normal adult-child power relations but dependency on words alone will inhibit some participants (Bragg, 2007). 'Theatre of the Imagination' reflects Alderson's (2001, p.147) assertion that play methods can enhance research imaginations along with short stories or vignettes, usually about imaginary characters in problematic situations, such as those depicted by children in response to the UN global learning goals.

3.11 The mosaic approach

The advantage of creative practice is that it can be used to capture more abstract concepts, experiences or phenomena. Drawing is a popular medium that many children are familiar with and frequently engage in, but drawings may be popular with some children and inappropriate with others. Individuals' perceptions of their ability to draw may limit what they depict, and the use of drawings is easy to misinterpret. Barker and Weller (2003) make the point that it is necessary to discuss the drawing with the participant to ensure that it comes closer to representing the child's meaning and interpretation than that of the researcher. The process of turning drawings into models and models into puppets used in the production of stories helped to capture the authentic voice of children.

Photographs can stimulate conversations in the data generation and analysis stages and have the potential to engage children in a meaningful way, not just as subjects of research but as researchers or co-researchers. Like drawings, cameras enable children to control how they represent themselves and provide an emic perspective (Gabhainn and Sixsmith, 2006). In the mosaic approach there are two stages: in stage one the children and adults gather

data; in stage two the data is pieced together by adults and children for dialogue, reflection and interpretation (Clark and Moss, 2005). This approach places a strong emphasis on listening to children's interpretations of data and on using their reflections as a springboard for affecting change, but students are not involved in every aspect of analysis. This makes reflexivity on the part of the researcher ever more crucial.

The methods of data collection and analysis chosen have the potential to silence, patronise or misrepresent children. Participatory methods may offer the possibility of eliciting diverse perspectives, but they are not impartial. Participation is aspirational in its attempt to access young students' views through a methodological process that assumes co-construction, interdependency and methodological equality between adults and children. I came to accept that there is only so much we can know about the 'Other' because the process of representation always involves selection and interpretation. Denzin and Lincoln (2000, p.1053) suggest that researchers give up 'a positivist ideal of textual and researcher authority by becoming reflexively aware of the limited portraits we are crafting in our research presentations by making ourselves visible in our texts'.

Warming (2005) argues for reflexive re-presentations and suggests that our re-presentations of children's narratives, drawings and photographs could present different, not necessarily congruent, perspectives on the same subject. What children say depends on what they are asked, how they are asked it, and who is invited to participate.

A combination of methods that reflect children's multimodal communicative practices offers the possibility of accessing diverse and nuanced views, including mine. This requires the rejection of the idea of an essential, authentic representation in favour of multifaceted, reflexive re-presentations of what is meaningful through the co-production of mosaic tiles.

3.12 Visual narrative inquiry

What use is research without image and story? Visual narrative inquiry is a way of being in the world (Bach, 2007). Seeing is about being in relation with people, nature and self. Visual narrative, according to Bach, is about simultaneously living a life and living a life narratively, a being that engages fully with the senses of the body and the mind.

Arguments for the use of narrative inquiry come out of a view of human experience in which humans, individually and socially, lead storied lives (Connelly and Clandinin, 2006, p.375). People shape their daily lives by stories of who they and others are and they interpret their past in terms of these stories. Story, in this sense, is a portal through which a person enters the world and by which their experience of the world is interpreted and made personally meaningful. Such stories are elicited through the 'bridge' stage of CLD workshops.

'Theatre of the Imagination' follows an iterative and reflexive process of moving from the telling of stories to collecting data and ultimately to research findings. Temporality, sociality and place create a conceptual framework within which different kinds of field texts and different analyses can be used. Visual narrative inquiry in the context of this research project, sets out to highlight ethical matters and shape new theoretical understandings of people's experiences (Clandinin et al., 2006) through the UN global goals. Narrative, as a form of qualitative research, focuses on the organisation of human knowledge more than merely the collection and processing of data and implies that knowledge is considered valuable and noteworthy even when known by only one person. Children will be encouraged to share their stories with me and others, by designing and making artefacts using the creative toolkit.

Clandinin believes that narrative is a powerful method of transferring knowledge; in this study it is intended to transfer knowledge by introducing creative tools that provoke memory, imagination and storytelling. Bruner's (1996) approach places the narrative in time that captures the emotion of the moment described, rendering the event active rather than passive (**Video 9**). Two concepts are thus tied to narrative storytelling: memory and notions of time, both as time found in the past and time as relived in the present.

Lakoff and Johnson (1999) encourage researchers to challenge how knowledge is seen as embodied and embedded in a culture based upon narrative unity. Storytelling nurtures rhetorical skills of persuasion and gives authenticity to the account. Collaboration enables storytelling to maintain dynamic relationships between partners and teams. Development psychologists utilise narrative inquiry to depict a child's experiences in areas such as self-regulation, problem-solving and development of agency. Storytelling is used to remember past events, reveal morals, entertain, relate to one another, and engage a community.

3.13 Signature pedagogies

Shulman (2005, p.52) explains that signature pedagogies are the types of teaching applied to educate practitioners for their new professions. A signature pedagogy has three dimensions: surface structure which consist of concrete, operational acts of teaching and learning; deep structure which reflects a set of assumptions about how best to impart a certain body of knowledge and know-how; and implicit structure with a moral dimension that comprises a set of beliefs about professional attitudes and values.

I believe signature pedagogies are therefore epistemological – they deal with things that researchers know and know how to do. And they are ontological, about the way people orient themselves to being and making meaning in the world. 'Theatre of the Imagination' also has an axiological commitment to the value of collaborative and co-operative ways of working to help nurture self-regulation and empathy. This combination of knowledge, being and values becomes a kind of 'indwelling' (Polanyi, 1966), conveyed through the researcher's stance and progressed through a set of pedagogies.

According to Thompson et al. (2012), the essential components of art and design pedagogies are: the approach to inclusion; the importance of choice and agency; the challenge of scale and ambition; the role of the absurd and the carnivalesque; and the lived experience of the present. Difference in school populations makes it increasingly difficult to assume that all children are the same and should be taught the same things in the same way and there is a need for schooling to support flexibility, the growth of peaceful communities, co-operative work practices, compassion and mutual respect. The pedagogies employed in 'Theatre of the Imagination' reflect Thompson's findings:

Practices

This was a means of engaging students in challenging tasks which required patience, practice and investment of time. Tinkering, experimenting, generating and trying out ideas with humour and disruptive intent was every bit as meaningful as learning through quiet contemplation (Sutton-Smith, 2006). Combinations of practices generated second and third thinking time (**Videos 8 and 9**).

Provocations

Provocations took the form of objects, images, sounds, people, events and actions which often appeared ambiguous and unexpected. They provided signposts to UN global goals as a stimulus for meaning-making, a trigger for individuals and teams to draw on their own knowledges and experiences. Provocations were designed to elicit stories and children's thoughts about global goals (**Videos 7, 8 and 9**).

Artefacts

The creative workshops fostered the use of found objects and the treasuring, display and curation of ephemeral material and creation using everyday resources. Artefacts produced during the workshops functioned as a record and reminder of children's thinking, as objects in their own right, and as transitory experiences. Ideas and reflections were collected through sketches, models and notes. Visual and written elements contributed to tiles of data for critique (**Videos 1–14**).

Moving out of the classroom

The creative workshops changed the climate of the traditional classroom. The learning spaces were re-designated as studios, and work also moved into external spaces including the garden, a garden pavilion and a boat on the Regent's Canal in London. The 'studios' were complemented with specialist technical resources. In this way, the spaces became a pedagogy in their own right (**Videos 8 and 10**).

Making an occasion

Performances and exhibitions were central to the processes. The readiness to celebrate, appreciate and reflect upon the artefacts and ideas of children was a key feature of the CLD process. The stories were linked to global concerns and the

memories of children, participants embraced ideas related to local people and environments, often beyond the boundaries of their school (**Videos 9, 12 and 13**).

Different classroom discourse patterns

Children, teacher and researcher dialogue tended to 'go with the flow', to try things out and to trust that events would take a positive and unexpected turn when approached in an open and creative manner. Exchanges may take place among peers and children at different levels of experience as well as with practitioners and teachers. These discursive situations prompt critical thinking and self-evaluation. I encouraged teachers and members of learning circles to focus on the potential meaning of artefacts and child-led interpretations of stories (**Videos 5, 6 and 7**).

The use of analogy, anecdote and personal history, combined with a freeing-up of the classroom atmosphere, a widely shared interest in local and community stories, and a readiness to improvise, supported the creation of rich narrative environments. This seemed to expand the horizons of possibilities for children (**Videos 5, 7 and 11**).

Ambiguity and abduction

Learning through design and making is a process of thinking, making and thinking again. This provokes ambiguity, dissonance and creative leaps which students learn to manage. The end goal of the process often continues to move until very late on. The ability to change direction helps to make sure that emergent ideas, or ideas imported from other domains and transformed, are given an equal platform throughout the process of CLD and PAR (**Videos 3, 4, 8 and 12**).

Alignment with disciplinary expectations

Some sessions were professionally framed with a focus on individual skill development. The 'rules of the game' were laid down through the organisation of space and sometimes more explicitly, through direct instruction. Within this disciplinary framing, methods of design and making were a frequent point of reference, with students looking at work by seminal practitioners (**Videos 5 and 7**).

The valorisation of collective endeavour

The work was both individualised and constructed as a team endeavour, products of a 'studio environment' where practice flourished. There was a multifaceted

approach to achievement, different to many other lessons with an equal interest in collective and individual accomplishment (**Videos 12 and 14**).

Building commitment to the community

As well as building sociality within the group, the tasks were about the remarkable nature of everyday life. For children, creative practice offered new connections with the community, bringing the worlds of school, the home and the world into closer contact with one another (**Videos 5 and 6**).

Paralleling

In tandem with the teachers, I simultaneously engaged in practice and in teaching-related activities. My intention was to demonstrate that it is possible to engage children in conversations and questions by undertaking activities that constitute co-design practice. Students were the co-constructors of learning (**Videos 8 and 12**).

Design thinking

The design thinking process of Stanford's d.school starts with 'empathise', a skill that needs to be nurtured to ensure people's success and well-being. The five steps of the d.school's design thinking process are: empathise, define, ideate, prototype and test. And the five steps of the design thinking model promoted by Ideo are: discovery, interpretation, ideation, experimentation and evolution. When these two models were considered together, a process resembling a synthesis between CLD and PAR emerged (**Videos 5 and 8**).

The sticky curriculum

Orr and Shreeve (2018) present the idea of the 'sticky curriculum' in art and design. Sticky is a term which has multiple meanings to convey the challenges, conflicts, dilemmas and ambiguity in the creative curriculum. Art and design pedagogies can be uncomfortable and destabilising. These pedagogies offer a model for a 'sticky curriculum', one which is global, connected and concerned with social justice with a focus on creativity and resilience (**Videos 6 and 9**).

Collaborative research

Co-design projects with Mexico and India (**Appendix 1**) provided the motivation for 'Theatre of the Imagination'. Enquiry-based learning, and the creation of original

creative tools to call upon signature pedagogies, draws upon the studio culture to foster design thinking and nurture a transdisciplinary co-production of knowledge. This research study demonstrated the feasibility of transferring art and design pedagogies from higher to primary education and helped to embed Cross and Archer's idea of 'art and design as a third culture' (**Videos 1–14**).

Wood (2011) reminds us of some basic principles we might wish to bear in mind when teaching design: empathy with the audience and the situated context; adaptability more than strategy; fairness and integrity in transactional relationships; emphasis upon notions of 'discovery'; collaborative compromise; accommodation of global issues; and placing equal value on the judgement of all participants. Wood's stance helped to define the climate I set out to foster in all the primary school workshops.

3.14 Metacognition in practice

When teaching metacognitive skills, I adopted the language of thinking through questions. The constructivist learning design (CLD) model provides a structure for metacognitive questions and thinking because it encourages students to probe deeply. The workshops need to allow time for written, oral and visual reflection. This approach builds upon Ogle's (1986) 'know; what to know; and learned strategy' (KWL) approach to metacognition and adds the question 'how?', as suggested by Mooney (1990):

Prior knowledge	participants fill in a pre-workshop evaluation and produce storyboards and drawings based upon previous experiences and knowledge and information introduced through seminar discussion based upon slide shows
What I want to know	children discuss ideas, provoked by photographic images and videos about the global goals to consider how environmental and social factors impact upon everyday life
What I have learnt	participants fill in a self-evaluation, post-workshop, and use mnemonics, drawings and models to share and explain facts and ideas conceived, related to the global goals

What I need to find out	students may search for further information or pose questions to develop new propositions in the form of drawings, models, assemblages and videos
How can I learn more?	students share stories and skills with others and collaborate on new projects within the 'design studio', across geographic space through the 'Blueprint Exchange' network

3.15 A 'triadic model' of participation

The CLD process underpins all 'Theatre of the Imagination' workshops. When 'reflection' is added to the process, CLD connects participatory action research (PAR) and participatory design (PD). By developing 'symmetrical reciprocity', PAR places the voice of children at the heart of this research process and provides the workshop activities with momentum. Manzini's triadic model of PD is relevant here as 'Theatre of the Imagination' synthesises diffuse design and expert design through co-design. It is action-oriented and connects transition design and design thinking to help develop creative practice as a metacognitive skill to help students find their voice through discussion and small-scale exhibitions.

3.16 Data collection and analysis

Collecting data related to the three key areas of interest is triangulated by the self-assessment questionnaire, video recordings of workshops and by learning circle discussions. The three aims of the study are woven into the questionnaire and reflect levels of thinking summarised in Hargrove's rubric.

The key areas of investigation were used to organise data emerging from the workshop activities. This structure also provided a basis for analysis of things said, written and made by participants and facilitators. Members of the 'learning circles', teachers and participants provided a forum for evaluation and reflection. Stakeholders were invited to discuss artefacts and videos during school-based exhibitions. Analysing qualitative data required 'toing and froing' between recordings, notes, self-evaluations, artefacts and theory. Categorising data sources helped establish evidence in support of the research question and themes, or evidence in contradiction. The multiple sources of data and analysis were key factors in the co-creation of the 'mosaic' data tiles, providing children and me with artefacts for visual narrative analysis (**Figure 3.5**).



Figure 3.5: Examples of 'mosaic tiles of data' for participant and 'learning circle' analysis

3.17 Pre- and post-workshop self-evaluation

The self-evaluation questionnaires, first tested by the learning circles, were designed to be easy to understand and enjoyable to complete by participants. The purpose of developing a vehicle for pre- and post-workshop evaluation was to raise participant awareness of the aims of the learning event and to encourage self-reflection and discussion, important aspects of metacognition and personal agency.

The questionnaire included criteria related to self-efficacy and self-regulation (Figure 3.6) and related to the level descriptors in Hargrove's metacognitive rubric. Participants were invited to respond to the questions before and after the pilot workshops to allow a comparative evaluation. The use of fun stickers to complete the 'pre-' and 'post-' self-evaluation exercises was an attempt to make the process more playful. Post-workshop evaluation was designed to enable participants to reflect on what they had learnt.

LIFE ON LAND

Before and after elf-evaluation booklet

NAME:

• How confident are you about drawing ideas?

UMMM

FAIRLY

QUITE

• How much do you know about automata?

UMMM

A BIT

A GOOD BIT

• How would you rate your making skills?

UMMM

OKAY

GOOD

• How often do you reflect upon your work?

UMMM

FAIRLY

QUITE

• How often do you try to improve your work?

UMMM

A BIT

A LOT

• How good are you at improving your work?

UMMM

OKAY

GOOD

• How effective are you in a team?

UMMM

SO-SO

QUITE

• How effective are you at explaining things?

UMMM

OKAY

GOOD

• How often do you help others?

UMMM

NOW AND THEN

OFTEN



Figure 3.6: The self-evaluation questionnaire

3.18 Reflexivity and the researcher

I was both researcher and actor in participatory design, where each participant contributed knowledge, ideas and competences to the process (Manzini and Rizzo, 2011). In ‘Theatre of the Imagination’, the children brought their stories, experiences and skills to bear upon problem exploration and I acted as co-designer, teacher, professional designer and technician with experience in social innovation and three-dimensional design. Manzini and Rizzo highlight the role of researcher as co-actor - someone who takes an expert role and, at other times, sits back. Each participant has the potential to take the lead creatively, and each has the capability to figure out, enhance and develop new ideas. The aim was to apply my agency to help foster the resourcefulness of children in collaborating as a design studio and to create a climate in which capabilities were shared.

When applying signature pedagogies in art and design to primary education, the concept of ‘stickiness’ (Orr and Shreeve, 2018) provided a useful frame of reference. Orr and Shreeve suggest that studio education is not delivered but forged. The concept of ‘the studio’ as a signature pedagogy in itself supports the idea of an architecture of affordances (Gibson, 1979), which helps to change the climate of a classroom and to change the way children learn. Orr and Shreeve believe:

Art and design curriculum is sticky because it is complex and contentious. For one student the curriculum may be viewed as a wonderful set of opportunities, whilst for

another it is experienced as a chaotic mess. To summarise, we assert that art and design curriculum is sticky for these reasons:

- it is messy and uncertain
- values stick to it in ways that are difficult to see
- it has an elasticity, being both sticky and stretchy
- it is embodied and enacted – it sticks to the person
- it is troublesome and challenging.

These characteristics offered children new ways of exploring the world, ways of sparking dissonance, ways of developing design thinking skills that enhanced agency, ways of communicating responses to global goals, and ways of provoking change through dialogue. Paradoxically, to allow the workshops to take on unexpected turns, detailed planning and organising was deemed essential by teachers. To create the space and freedom to ‘let go a little’ meant that the course of events, from one workshop to another, differed. Finding ways of allowing children to take the lead sometimes compromised data collection related to the key areas of the investigation. But ‘sticky and stretchy’ moments also provided compelling examples of agency and metacognition through design and making.

3.19 Ethics and the research project

‘Theatre of the Imagination’ is focussed upon researching the impact of design and making in primary education across geographic space and therefore a secure code of ethics is critical. Managing the space that exists between a common good and the individual is fundamental. The research ethics protocol and consent set out to illustrate how, in a practical way, this may be achieved.

The code of ethics is based upon work undertaken by the United Nations Children’s Fund. All participants in ‘Theatre of the Imagination’ including educators, researchers, and participants were required to support the principles and declarations outlined in the protocol (**Appendix 7, p. 272**). Respect for the dignity, well-being and rights of all children, irrespective of context, was central to the philosophy that underpinned the workshops. Such respect was integral to teachers’ and researchers’ decisions and actions concerning the nature and conditions of children’s involvement in any of the activities. The protocol and consent forms were submitted to the Royal College of Art’s research committee and I

obtained a Disclosure and Barring Service (DBS) certificate which, while not compulsory, supported my commitment to the health and safety of children.

The ethical approach was monitored and reviewed once the protocol had been agreed by a senior teacher in each primary school taking part. Consent forms were sent out to parents and guardians prior to each workshop and it was made clear to participants that they were free to withdraw from any activity, at any stage, during the workshops. The consent form sought permission to use images and work produced by children for the purposes of this research, for a period of five years, and for promotional purposes by the schools in the network. Considering the ethical approach of working with children fostered reflexivity in participants, facilitators and on my part.

4.0 'Theatre of the Imagination' workshops

The methods outlined in Chapter 3 helped me to structure the delivery of a series of primary school workshops based upon selected UN global goals. The idea was to collect data and to determine if personal agency and empathy can be nurtured in children through the introduction of the 'Theatre of the Imagination' creative toolkit.

4.1 Potential for chaos – an opportunity for creativity

I modified and developed each workshop in response to recommendations arising from learning group discussion and feedback from participants. Detailed timetables for each workshop were shared with the class teacher and revised when necessary. In all cases, I made changes in response to issues arising on the day, the needs of the school, and those of the children. It became increasingly obvious to me that nothing could be 'carved in stone' and a high degree of flexibility was necessary in the context of primary education.

My prior experience in higher education helped me respond to the fluid nature of primary education, complete with its myriad of unexpected twists and turns. This dynamic tension added an unexpected level of complexity that gave rise to unplanned opportunities. The accounts of the workshops reflect the actual experience of being in a continuous state of reflection and reappraisal and my attempts to represent this reality through a description of my experience. This account sometimes focusses on detail and sometimes summarises broad swathes of work. I believe the balance is made secure as the meta-structure, based on the CLD model, is woven through all workshops. The thematic areas of the investigation are embedded in the aims and self-evaluation questionnaire, a tool used to promote reflection and capture thoughts through question-driven inquiry with participants including children, teachers and other facilitators.

The teaching skills I gained through experience reflected what school governor Dr Sharon-Michi Kusunoki suggested was like 'tuning the engine while flying the aircraft'. It was rewarding to find that primary-aged children were generally accepting of my lack of experience and uncertainty and many were prepared to lend a hand to make things work. The creative workshops were made richer by the diversity of participant preferences, school culture and other local circumstance. This was difficult but made possible by the support of

teachers and other professional colleagues involved (**Figure 4.1**). The self-evaluation questionnaires helped to keep the key themes at the heart of the action throughout the ebb and flow of activities.

Workshops at West Dean Primary School and Plymouth School of Creative Arts are included as case studies in this section of my thesis. Workshops undertaken at Halstow School in Greenwich, and the Indian Institute of Technology (IITB), are included as Appendices one to four (**pp. 189-217**). All workshops were the subject of visual narrative enquiry (**pp. 164-173**) and provide evidence in support of transferring signature pedagogies to foster agency. I asked arts co-ordinator at Halstow School, Isabel Pulley, to articulate her reason for engaging in the research project:

Introducing the workshops across the whole of KS2 may help establish flexibility in our pedagogic methods as you are transferring ideas from higher education – that is potentially valuable in relationship to our school culture at a time when there is a narrower focus on teaching to tests.

school	workshop	participants	key stage	status
Halstow Primary School Dec 2015	workshop one Make Your Move learning circle	2 teachers 3 designers 2 students 1 researcher	N/A	mainstream primary
Halstow Primary School Feb 2016	workshop two Make Your Move pilot workshop	4 children 2 teachers 1 parent 1 researcher	UKS2	mainstream primary
Halstow Primary School May 2016	workshop three Make Your Move whole class	30 children 1 teacher 1 teaching ass.	UKS2	mainstream primary
PSCA Oct 2016	workshop one Life Below Water workshop	8 children 1 teacher 3 researchers	LKS2	all-through free school
PSCA July 2017	workshop two Life Below Water workshop	4 children 1 researcher	LKS2	all-through free school
West Dean Primary School Feb 2017	workshop one Life on Land workshop	12 children 1 designers 1 governor 1 teacher 1 researcher	LKS2	mainstream primary
West Dean Primary School June 2017	workshop two Life on Land workshop	12 children 2 teachers 1 governor 1 researcher	UKS2	mainstream primary

Figure 4.1: Overview of schools in the UK involved in ‘Theatre of the Imagination’ (2018)

4.2 Plymouth School of the Creative Arts

Two workshops were organised to take place at Plymouth School of the Creative Arts (PSCA). This free school, for children aged four to sixteen, opened in 2013 and was set up by Plymouth College of Art (PCA) to establish a progressive continuum of creative learning and practice at primary and secondary levels, before feeding into Plymouth College of Art at the tertiary level (**Appendix 6, p. 239**). Principal Andrew Brewerton acknowledged that setting up a free school was risky, but he also suggested that art colleges must seize all opportunities in a political and economic environment that is hostile to small, specialist institutions.

According to Brewerton, PSCA is based on an established art college ethos in response to the serious erosion of creativity in school. It is a place for making things and for discovering how knowledge, values, language, identity and experience can be nurtured through creative learning (**Figure 4.2**). Many leading creative practitioners, including Jonathan Ive (2017), are concerned about the lack of material exploration and making in schools.



Figure 4.2: Plymouth School for Creative Art (Feilden, Clegg, Bradley Studios, 2015)

4.2.1 ‘Life Below Water’ workshops

Two ‘Theatre of the Imagination’ workshops held at PSCA on 18th October 2016 and 12th July 2017 respectively, related to Global Goal 14: ‘Life below Water’. The aims of the workshops were to foster agency through creative practice; to develop metacognition through design thinking; to nurture empathy; and to consider how design in primary schools can help affect social and environmental change. These aims embed key features related to personal agency and its impact upon cognitive development in children: cognitive conflict – the mind develops in response to stimulation; social construction – dialogue with others; metacognition – reflecting on how questions may be approached in an effective way; and self-regulation – the ability to control personal behaviour or thoughts in any situation (Garton, 2004).

‘Life below Water’ set out to explore how primary student thinking and action might help to achieve small steps towards improving the water quality in our oceans. An education in global citizenship includes opportunities for young people to develop their skills as agents of change and to reflect critically on this role (Oxfam, 2015). Transition design encourages a long-term vision for society and a portfolio of methods for changing attitudes and behaviour. I designed ‘Life below Water’ as a workshop to encourage and enable participants to:

- develop skills and knowledge;
- reflect upon the historical work of artists and designers;
- produce experimental line drawings;
- develop 3D wire models to depict ideas;
- communicate design ideas through storytelling and humour;
- help peers to achieve novel outcomes;
- make connections between design thinking and global citizenship;
- reflect upon what was learnt and the next steps.

4.2.2 ‘Life Below Water’: workshop one

The first pilot workshop at PSCA was conducted in collaboration with Kodama, a partnership of innovation design engineering graduates from the RCA (2016). Collaboration between a fledgling commercial enterprise and the design researcher, in the autumn of 2016,

generated valuable ideas concerning the potential for connecting analogue and digital animation through blended learning (Figure 4.3).

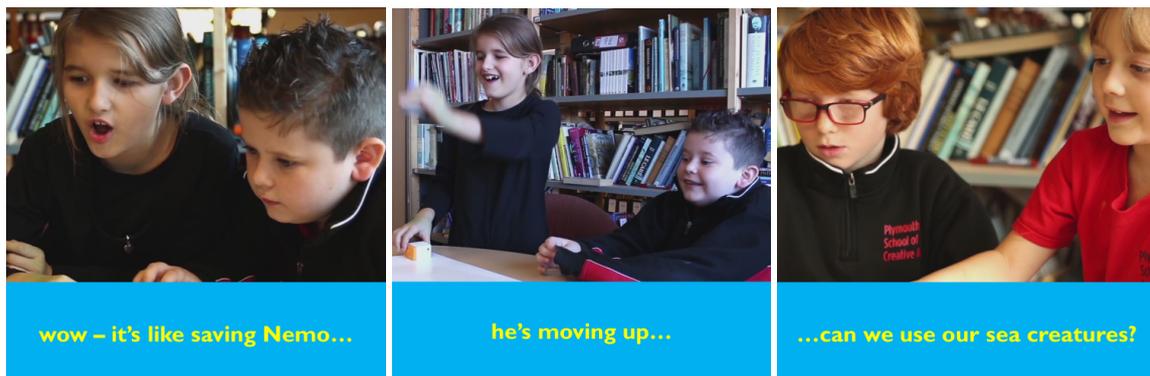


Figure 4.3: Lower KS2 children testing the Kodama digital animation prototype

Situation

'Life Below Water' was the UN global goal selected for exploring pressing concerns about plastic pollution in our seas. Posters and images from the UN global goals website helped set the scene for lower KS2 students based in a city with an extraordinary maritime history (Figure 4.4). 'Life Below Water' focused on the impact of pollution in our seas, what this signifies for a world where seas, oceans and people are connected, and what we can do to help. One of the UN targets is to prevent and significantly reduce marine pollution of all kinds, from land-based activities, including marine debris and nutrient pollution by 2025 (UN Global Goal, 2016).

Rachel Carson (1991, preface, p.xiii) noted:

It is a curious situation that the sea, from which life first arose, should now be threatened by the activities of one form of that life. But the sea, though changed in a sinister way, will continue to exist, the threat is to life itself.



Figure 4.4: Global Goal 14: 'Life Below Water' (2015)

Groups

The pilot workshop was, once again, designed to encourage individual participants to work in duets and in quartets. Eight lower KS2 students, the link tutor, the Kodama team and the researcher worked together to explore the problem and to generate ideas. Participants, paired into friendship duets, often with different levels of knowledge, discussed their thoughts on the causes of debris in the ocean and were invited to consider how changes might be made. This linked a global goal to a local issue that participants had direct experience of in their day-to-day lives and was taken into account when planning the video animations during the second workshop (Figure 4.7, p. 104).

The aim was to foster scaffolding (Vygotsky, 1986) through a zone of proximal development. Scaffolding learning (Bruner, 1960) in 'Life below Water' within the CLD process supported the theory that difficult tasks lead to the greatest learning gains (Mercer et al., 2017). Facilitation included sharing facts about pollution below water, convening seminars, testing the digital animation prototype and demonstrating drawing and making skills. The support I provided in the design and making workshop was slowly reduced as construction progressed, students gained in confidence and participants began to demonstrate greater independence and effective collaboration.

Bridge

Students were asked to imagine sea creatures with magical powers. Through abductive thinking and case transfer, participants shared creative concepts in the form of drawings and wire models (**Figure 4.5**). Creative practice and dialogue elicited thoughts and feelings from participants and nurtured action learning (Revans, 1995). Drawing and making began at the intrapersonal, tacit level and then assisted the task of sharing ideas at an interpersonal level. This 'distributed' form of higher mental function, according to Vygotsky, requires a concept to exist in an external frame. As drawings and models emerged, so learners were able to access help from others with more experience who actively sought to improve the potential of the team (Knight and Littleton, 2015).

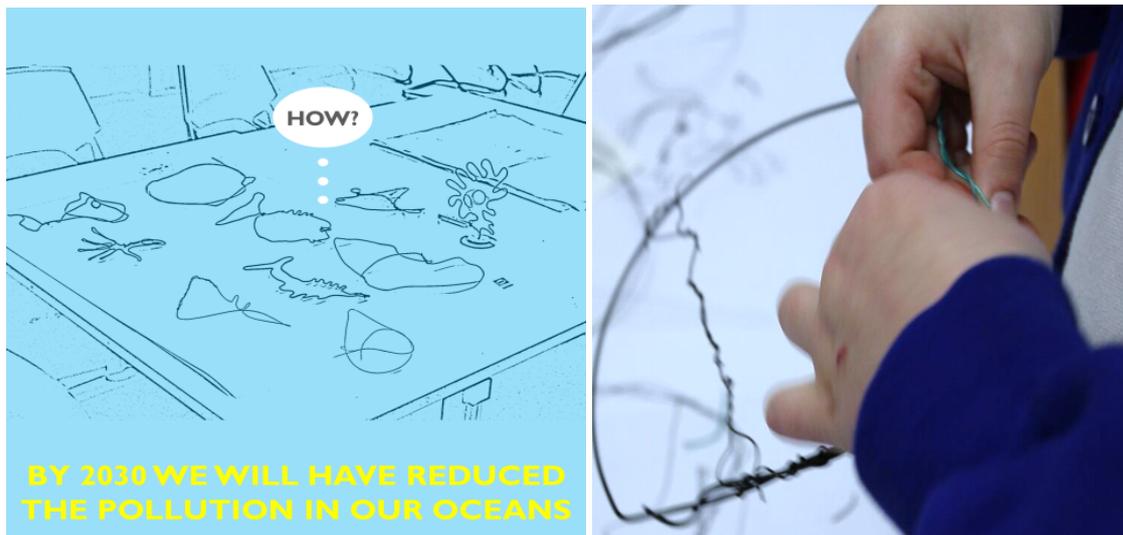


Figure 4.5: Calderesque sculptures of magical sea creatures at PSCA (2016)

Tasks

Ideas for the magical sea creatures were drawn and drawn again. As these ideas developed, so the stories of derring-do were enthusiastically shared with partners, teachers and friends who stopped by. The designs and wire sculptures flourished and were subsequently transformed into 'Bags of Fishy Stories', a series of ekphratic, graphic artefacts designed to support storytelling and videomaking in workshops across an international network (**Figure 4.6**), which, it is hoped, will be further developed as an international network at the postdoctoral stage.

Participants began by creating drawings and discussing ideas about how their magic sea creatures might help address the problem of sea pollution. Line drawings in pen and pencil were translated into wire sculptures, influenced by the work of Alexander Calder (2016). A short demonstration of how different thicknesses of wire could be bent, manipulated and joined together was followed up by one-to-one support where necessary. Some participants required more help than others and this was provided by peers with effective hand skills, supported by me as an 'experienced old-timer'. Stories were co-created and shared.

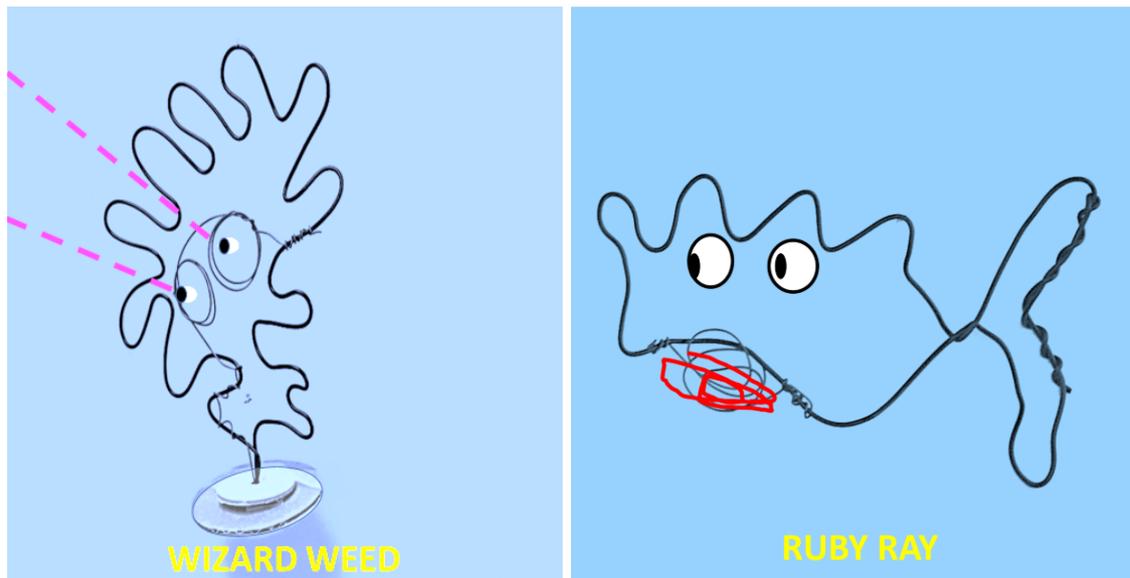


Figure 4.6: 'Bags of Fishy Stories' (2016)

Lower KS2 students completed a series of wire drawings and short stories from which we developed the concept of an aquarium of magic sea creatures and, subsequently, 'Bags of Stories'. These became a vehicle for visual narrative inquiry, used to collect the thoughts and reflections of children concerning what they had depicted and what this meant to them. Together, we developed 'Bags of Fishy Stories' as ekphrastic objects, or rhetorical devices, to learning circles for their evaluation. The juxtaposition between image and word provoked discussion with each individual and in group critiques. The 'crit' as a form of signature pedagogy in art and design was also adopted as a tool for analysis. My interactions with teachers and members of the 'learning circle' often took the form of discussion, based on 'the 'themes' of the study and their connection to ideas expressed by the children.

This series of envelopes and characters was well received by teachers at PSCA and by external partners in the UK and overseas. For example, copies of 'Bags of Fishy Stories' were requested by colleagues from the Helen Hamlyn Centre for research with children who have special educational needs (2017). The artefacts were also used in the second workshop at PSCA (2017) as a starting point for discussion, and other schools have requested copies for workshops with children in Germany and in Spain.

Evaluation

I collated a summary of recommendations for workshop two (**Figure 4.7**) in collaboration with members of the learning circle, children and practitioners. Participants completed the ‘pre-’ and ‘post-’ workshop questionnaire; took part in discussions during the workshops; and took part in a critical review of the process and artefacts. Non-participant teachers, students and parents were also invited to comment and give feedback in the exhibition we mounted at the end of the workshop. Consensus suggested that design thinking and making developed a deeper understanding of local and global environmental concerns and nurtured a sense of personal agency in participants.

actions from workshop 1	learning circle ideas	reflections	impact on resources	contingency
introduce drawing activity	demonstrate drawing and wire bending	relate to context of sea creatures	allocate 30 minutes	shift video animation
introduce a structured writing activity	haiku and limerick = poetry + fun	demonstrate the process of co-designing	allocate 1 hour and have iPads at the ready	Improvisation and automatic writing
recruit a facilitator	a primary school teacher + video skills	practice video and writing activities	a full-time facilitator for a day and a half	work with the same LKS2 group
extend global goal seminar	beachcombing	health and safety issues are difficult	half a day and a qualified teacher	collect rubbish from the playground
Introduce video making using puppets	contact PCA for equipment and support	If possible meet students the day before	potential for delay and additional kit	book video kit from RCA.
secure a studio to reduce distraction	space in short supply and high demand	test out shared informal space	high impact as majority of space is open	secure a quieter space in open plan
set up interviews with teachers	schedule in advance – lunch meeting?	email Cass in advance with questionnaire	1 hour, 4 meetings	organise skype interviews

Figure 4.7: Actions arising from discussion with the learning circle (2016)

I noticed that drawing and making helped students think and plan, and as time progressed most students became absorbed by the process. The process of re-making and iterating enhanced self-efficacy as new ideas emerged as the subjects of further reflection. Self-regulation was evident in some students through prolonged periods of concentration and this had a positive, osmotic effect upon the group. It was rewarding to witness how this newfound sense of personal agency and empathic behaviour fostered a kind of virtuous circle. David, a highly experienced art teacher at PSCA who teaches philosophy through drawing at the school, visited the 'Life below Water' exhibition. He suggested that collaboration with non-specialist teachers in mainstream education may help to build confidence in using creative practice to develop thinking skills in children.

Directed independent learning (Thomas et al., 2015) is a process through which higher education students engage with the art and design curriculum to achieve learning goals. This signature pedagogy presented children with opportunities for formative feedback on their ideas generated in 'the studio' which helped foster metacognitive thinking. The distinction between declarative ('knowing that') and procedural knowledge ('knowing how') is also relevant to teaching performance (Shulman, 1987). General pedagogical knowledge has not been the object of many research studies, according to Shulman, even though it is essential for developing quality teachers. The pedagogic skills supporting 'Theatre of the Imagination' were highlighted in the workshops to help professional development in teachers and innovative thinking in children. Fostering project-centred learning through design and making may benefit from further research in relationship to teacher motivation (Tschannen-Moran and McMaster, 2009).

Exhibition

The wire sculptures produced by children during 'Life below water' were displayed at the site of the workshop (**Figure 4.8**). This provided participants and me with a platform for immediate feedback and allowed students and teachers who did not participate to comment on the work and ideas generated by participants. Many students who visited the workshop showed great interest in getting involved at a future date, and many wanted to try making wire sculptures immediately. In response to demand, participants and I began demonstrating making techniques as part of the exhibition and discussed setting up a

‘makers club’ with deputy headteacher Andy. The exhibition generated discussion within the learning circle about embodied knowledge and what Merleau-Ponty (1964) described as the world of everyday experience, and how this lived-through world was projected by primary participants in their sea creatures.



Figure 4.8: Wire sculptures of sea creatures on exhibition in the studio (2016)

Teachers, students, the Kodama team and I discussed the designing and making of magical sea creatures in response to a global goal of local significance, and participants who tested the digital animation product suggested bringing the ‘physical making’ and ‘digital making’ workshops together. Blended learning using face-to-face teaching and digital learning in rotation is growing in practice as digital technologies become ubiquitous through initiatives such as the Khan Academy (www.khanacademy.org). ‘Theatre of the Imagination’ may provide a platform for demonstrating the advantages of the digital–analogue synergy.

Primary children and teachers suggested that Kodama’s pre-designed characters could, for example, be substituted by 3D scanned models of the magical sea creatures made by children during the workshop (**Figure 4.9**). One of the KS2 participants with an interest in 3D modelling suggested that discarded plastic bottles could be collected from the beach and recycled to make plastic filaments for making 3D models from the scanned images of their wire drawings. Participants came across Dutch designers at ‘The Better Future Factory’ during an internet search. The Rotterdam-based social and sustainable design consultancy had developed ‘Refil’, a company that makes high-quality filaments for 3D printers from discarded plastic bottles. Such ‘creative serendipity’ emerged regularly throughout the workshop and the balance between ‘directing and letting go’ became a critical pedagogical skill in the studio, requiring further reflection and testing. The artefacts designed and made by participants were the physical manifestation of their imaginations which encompassed lived experience and thinking about how their ideas might change future ways of being.



Figure 4.9: ‘Bags of Fishy Stories’ – mosaic tiles (2016)

Reflection

I worked with eight lower KS2 students with support from Plymouth College of Art link tutor Cassandra Bisco. 'Life below Water' took place in an open space where children were free to wander. I found that encouraging participants to maintain focus required teaching skills which, at times, stretched me. The event generated feelings of excitement and trepidation and this persisted for the entire two days. Part of the ethical agreement was to make it clear all children had the right to leave the workshop at any time. The partnerships were left up to the children, which left Tom paired with Olivia, almost two years his junior, and he exercised the right to leave the workshop at first break. This was mitigated by the fact that the remaining duets were content and focussed. Following discussion with Cassandra, we decided to allow partnerships to be agreed by participants prior to the next workshop.

The relatively low number of participants meant that the sample size did not set out to establish generalisability but did enable me the proximity to develop a rich picture of the thoughts, ideas and reflections of children (**Figure 4.10**).

with participants and teachers. I explained the meaning of each question and checked for understanding, but it remains doubtful that all students understood all questions. A summary of the difference in student perceptions before and after the workshop is shown below (Figure 4.2j).

life below water: workshop one (8 participants)	pre-to-post scores
how effective are you in a team?	+7
how important are the global goals?	+22
how often do you help others?	+1
how much do you like working with computers?	+5
how much do you like working with materials?	+7
how about materials and computers?	+1
how often do you reflect upon your work?	+6
how good are you at improving your work?	+6
how good are you at imagining new ideas?	+2
how confident are you about drawing ideas?	+1
do you know much about animation?	+7
how would you rate your making skills?	+7

Figure 4.11: Summary of self-evaluation in ‘Life below Water’: workshop one (2016)

4.2.4 Fostering agency

- self-efficacy and independent learning;
- self-regulation and collaboration;
- idea generation;
- self-evaluation and continuous feedback.

How effective are you in a team?

The change in perception across the pilot group (+7) was significant. Pre-workshop scores were generally high and those who scored their efficacy in a team as average in the pre-workshop questionnaire changed their assessment to 'high' in the post-workshop questionnaire. The emphasis on working as teams in the 'design studio' may account, in part, for this positive outcome. Shreeve et al. (2010) suggest that the studio is at the heart of education in art and design and students learn through engaging in activities which reflect those undertaken by practitioners in the field and as such are recognised as junior but legitimate members of a 'community of practice'. While Shreeve related this specifically to students in higher education, it also reflects project-based learning (PBL) theory, where I adopted the role of an experienced 'old-timer' and stepped in to help now and then.

'Life below Water' demonstrated that it was possible for me to help children to go about a collaborative task and, at the same time, reassure each individual of their ability to express personal, embodied knowledge using physical materials for idea generation. The embodied knowledge of participants emerged through experimentation and making, and by supporting and valuing each unique 'hand'. This illustrated to me, and was supported by the observations of art and philosophy teacher David, how scaffolded learning can be highly developmental when the learner is fully engaged in making things while collaborating with and supporting partners.

How often do you reflect upon your work?

The concept of reflection became the focus for student discussion based upon personal examples of what this means in relationship to learning. Some students continued to struggle with the concept of the 'pre-' to 'post-' workshop questionnaire but the outcome (+6) indicated a significant shift in perception. Jude felt that remaking drawings and models during the process of designing 'makes you want to make it better'. Macauley felt that

drawing 'helps you see if it's right ... if it matches your ideas'. Summer believed that visualising ideas for sea creatures eased discussion: 'Sometimes you see how the magic power is supposed to work but if you are not sure then you can ask'.

How good are you at improving your work?

Pre-workshop scores were medium to high and the post-workshop scores (+6) showed variance across the group. One-to-one and small-group discussion helped to determine the thinking behind the self-evaluation. Summer said she found the idea of magic sea creatures funny but when it came to making the wire sea creatures she found it difficult: 'I bent this bit by mistake and thought, okay that can be its magic power ... like a Dyson for the water'. Serendipity in this case gave Summer impetus to continue making a successful model. Olivia provided an 'outlier' in relation to this question by placing stickers in all the available circles. When asked why she had chosen to do this, her answer was, 'I like the pattern', which highlighted the importance of proximity, allowing the discussion of anomalous answers within the group. It appeared to be no coincidence that Olivia's playful attitude translated into a shoal of small wire models of magic sea creatures, each three-dimensional sketch informing the next in quick succession. That was prior to her final *pièce de résistance*, 'Rubbish Kisser'.

How good are you at imagining new ideas?

The pre-workshop self-evaluations were above average. Two students, judged by their teacher to be highly creative, moved their self-assessment score from average in the pre-workshop assessment to good in the post-workshop evaluation. The outcome indicated a small positive move up the scale (+2) across the board. There did not appear to be a pattern of overmarking across all questions, but in some areas, such as imagining new ideas, the consensus was that marks were slightly inflated, pre-workshop, by some students, which did not leave much space to indicate improvement in the post-workshop evaluation.

The perception expressed by Macauley and Summer that design and making helped them to imagine new ideas provides a reliable guide to how students who show fluency in creative thinking can use drawing, designing and making to express innovation. Feedback from teachers and parents was that these students found the link between making, thinking and

storytelling inspiring. Macauley suggested, 'Designing means you can think nonsense ... then think "why not?"'

How would you rate your making skills?

The pre-workshop answers to this question were the most varied of all responses and stretched from low to very high, moderated by the year teacher as being, 'a fairish assessment'. The post-workshop outcomes (+7) were high or medium, which indicates that students felt they either consolidated or improved their skills. The perceived consolidation and enhancement of skills is fundamental to the process of developing efficacy and regulation and, on reflection, I believe the drawing and making exercises could be increased to build even more confidence in students at Plymouth.

It is possible, from the response and feeling of teachers, that their skills and confidence may also be nurtured by developing design thinking and making tools to support personal agency. The deputy headteacher's positive observation concerning the link between designing and making, global learning, and storytelling suggests there is pedagogic value related to effective communication and teamworking through making things. The learning circle agreed that making 'Talking Pegs' videos and developing magical creature personas was a valuable method of fostering 'student voice through visual narrative'. I suggest that it also illustrates how small interventions may provoke big ideas.

4.2.5 Developing metacognition

- drawing as thinking and planning;
- planning, storyboards and oral language interventions;
- focus and concentration;
- small-group discussion.

How much do you like working with materials?

The pre-workshop response to this question was high or medium and the post-workshop change in position showed a significant move (+7) overall. Observing participants making models 'from the imagination', using ephemeral and found materials, was mutually self-enhancing for partners. Students iterated 'back and forth' from two and three dimensions and, from time to time, helped their partner to do the same. Each step signified a new

exploration and new thinking. Haptic skills were honed as wire was twisted and formed into shapes and the creation of hybrid creatures resembled the surrealist game of exquisite corpse, as co-production took shape.

Some lower KS2 students found manipulating the wire more difficult than others. One-to-one working with these students helped and by the end of the first hour all participants were immersed in the process. The group understood the ephemeral nature of the materials, which encouraged reusing and remaking. All students took advantage of this and began to develop their visual vocabulary while determining what special powers their magical creature would possess, often seeking feedback from their partner.

The objective to make digital videos of the creatures and their adventures did not take place during the first workshop, as time ran out. Although initially frustrating, 'Bags of Fishy Stories' emerged as an alternative outcome for dissemination and use in future workshops. Allowing things to take an unplanned course encouraged children to engage in the process of design ideation as a metacognitive skill.

How much do you like working with computers?

The pre-workshop responses to this question were all marked at the highest level and participants had the appropriate skills and knowledge needed for the Kodama workshop. The only way in which participants could indicate increased engagement was to place their sea creature stickers in the space on the paper beyond the highest level (+5). Summer decided to do this while declaring, 'It was amazing – very different'. And this was endorsed by KS2 teacher Huw: 'The group found the combination of physical and digital making fun to engage in. For some children, software is not always that easy to use - and for others, making three dimensional models in wire stretched their thinking and making skills.'

How about materials and computers?

Mixed messages emerged from this question with some participants scoring the combined approach lower during the post-workshop evaluation (+1). Some students would have preferred to spend more time in one or the other workshop and some would have liked to spend more time in both workshops. As the two pilot workshops had been designed, in the first instance, for four students the fact that there were eight meant the timetable had to be

reviewed and changed in 'real time'. I found that planning and organising from a distance, and taking into account last minute curriculum commitments, demanded contingency planning, and this proved to be the case for all 'Theatre of the Imagination' workshops.

Most participants remained engaged throughout the two half-day workshops and a climate of creativity and growing confidence flourished. The nature and range of the tasks encouraged both independent and collaborative working and students appeared to navigate changes, from one workshop to the other, without hesitation or difficulty. The two workshops, running side by side, encouraged the transfer of ideas, from one domain to another. The proposal to merge the two approaches into a blended, analogue–digital method of animation struck a chord with students, teachers and the practitioners. This is a compelling example of what Pierce (1965) described as serendipitous abduction of a surprising observation.

How confident are you about drawing ideas?

The pre-workshop assessments were predominantly high and one student, who self-assessed as average, moved up to confident at the post-workshop stage (+1). The advice given to all participants at the beginning of the first drawing session was to fill the paper with a single drawing. The researcher gave participants a high level of support at this stage to help those who were not confident about 'rescaling' their drawings. Those who were confident found this straightforward, while others took two or three iterations before they found their feet. The transfer from drawing on paper to 'drawing' using wire was introduced through a short technical demonstration aimed at developing skills in wire manipulation and there was a sense that the creatures were being 'brought to life', according to Macauley. This feeling reflects the feedback by Noah at West Dean, who described his portraits as 'leaping off the page' and becoming 'like a new friend'.

One reason for using wire for drawing was to 'transport' participants into the realm of three-dimensional space and to raise questions about why and how we go about the practice of drawing or 'dithering' (Speed, 1913). The confidence and thought invested in the drawings grew as participants began the process of making and making again. When I explained to students that 'all your drawings are valuable' I felt a tangible change in the way the group engaged in the exercise and this feeling was confirmed by children at the end of

the workshop. Summer began by marking herself high in confidence at the pre-workshop stage and placed her fish sticker in the 'ummm...' circle at the post-workshop stage. When asked about her self-evaluation, she said, 'I thought I knew all about drawing but now ... it's like a new thing'. Year teacher Huw said that he could see the connection between drawing and philosophy as David had seen. He explained this meant the relationship between the mind, imagination, and the physical world.

Some of the participants' drawings were fluent and expressive, while others might have benefitted from short exercises to help develop a more open approach. As time progressed, the climate became more experimental and it was rewarding to see students drawing and redrawing ideas without being anxious about the outcome, or what peers thought.

How much do you know about animation?

Participants scored themselves as average or low on their knowledge of animation, which suggested thoughtfulness and self-regulation. The change from 'pre-' to 'post-' assessment (+7) is significant and suggests that the immersive experience of the Kodama workshop gave a clear and distinctive opportunity for participants to see the potential of controlling the movement of characters, in real time, using physical icons as control instruments. This would prove helpful during the second workshop.

Learning circle discussion following 'Life below Water' focussed upon the potential for real-time animation, offering users the opportunity to select or make physical characters as a visual communication tool for children who speak different languages, teachers and students with special educational needs, and scientists and artists or other culturally diverse people. One member of the learning circle suggested that real-time animation could be a useful communication tool for doctors and young patients, to improve insights. Members of the learning circle noted that skills development in animation fostered creative thinking and a high level of focus on exploring storytelling.

How important are the global goals?

Lower Key Stage 2 students at PSCA engaged with the theme 'Life below Water' at an early stage in the workshop on seeing a series of images of debris at sea and by listening to facts about pollution on a UN video of celebrities talking about the problem. The posters and videos supporting 'Life below Water' left little to the imagination. All participants assessed the global goals as being of low importance at the pre-workshop stage. The level of change (+22) in the post-workshop assessment constituted an extraordinary shift in perception, by far the largest shift across the entire questionnaire. Participants discussed the effect that plastic debris is having on animals and the environment.

Imagining and making sea creatures with magic powers over two half-day workshops was designed to reinforce the connections children made between local and global environments and to nurture design thinking about how their ideas and interventions might improve things in the future. The degree of change in participant awareness suggested that exploring a problem through designing and making can encourage reflection at lower KS2 level. Design thinking contributed to a very significant change in perception across the entire PSCA workshop group. Thinking, and thinking again, while planning an effective approach to problem exploration is at the heart of metacognition. Design and making supported this process and the process of making the thinking of children tangible.

I raised arguments for and against the contested global goals framework and encouraged participants to develop counterarguments in their teams and with partners. A point of view expressed by one lower KS2 student was that the UN target dates way into the future may give offenders licence to continue offending because changing behaviour is difficult: "How do you get someone to stop doing what they already know is wrong?" Other participants felt that 'the rules' needed to change and one participant compared the problem to careless driving and not thinking about the consequences of air pollution on children.

How often do you help other people?

Working in parallel with the Kodama digital workshop team, while making the event more complicated, provided a rich contrast of experiences. The 'workshop within a workshop' format informed subsequent pilots. The Kodama team suggested they could see how participant making could assist future beta-testing (and have integrated this in their latest

developments). The educational value of making digital objects could encourage design and making skills, personal agency and character development. By iterating backwards and forwards through model-making, storytelling and animation, we could see how a wider range of creative ideas was being fostered.

This question, when put to children in their evaluation exercise, touches on Vygotsky's concept of the 'zone of proximal development'. I helped all participants at the beginning of the workshop but the amount of time spent on one-to-one help tapered off quickly for some children but not for all. Participants who sought most help became easily distracted and therefore required more time. When Tom helped Olivia to become more proficient at wire bending she was able to concentrate for longer periods of time but he left the workshop. This observation and anecdotal feedback indicate how higher student to staff ratios, and funding cuts, narrow the curriculum and suggests that investing more time and resource at the beginning of a learning event produces dividends later.

Macauley's making skills were relatively fluent and the opportunity to design and make a new sea creature triggered a series of imaginative ideas, drawings and models. When his friend and partner Theo needed additional help, Macauley was keen to help. But Theo was happy to sit back and watch. Doing things for, as opposed to showing someone how, provoked a markedly different level of engagement. It became clear that the teaching approach taken at these pivotal moments demanded my proximity and awareness. I could see how directed independent learning (DIL) was nurtured through co-designing within the culture of 'studio as a design team'. It takes time to inculcate this way of working but, when scaffolding is effective, creative ideas and objects emerge that transcend and surpass the sum of their parts.

Pedagogic knowledge demands declarative and process knowledge informed by subject knowledge. Developing pedagogic knowledge and basic skills related to design and making in mainstream primary education may help busy teachers gain confidence in applying the creative toolkit that is emerging from 'Theatre of the Imagination' workshops. Developing teacher motivation through the creative toolkit is at the heart of nurturing process knowledge and confidence, and this requires investment in professional development, as highlighted in the Winterhouse Matrix.

4.2.6 Life Below Water: workshop two

The second 'Theatre of the Imagination' workshop at PSCA took place in July 2017 and began by testing if the 'Bags of Fishy Stories' could be used to provoke new narratives and elicit opinions about future changes in our 'ways of being'.

On arrival at PSCA, it became apparent that some unexpected changes in scheduling and approach would be necessary to meet the needs of the school. The workshop was restructured to enable lower KS2 participants to work in a busy, open space in one of the main teaching areas. This meant that I had to manage a series of interventions by non-participant children who wished to join the workshop and when participants attempted to intervene to help control this escalating problem a spat of anti-social behaviour and class teacher intervention followed. The link tutor who helped organise the workshop was involved in other duties throughout the day, which meant that teachers I had not met before, and who had not been briefed prior to the event, helped while I tried to adapt to working as the sole facilitator in an unexpectedly chaotic environment.

To simplify this workshop, we spent the first morning reviewing 'Bags of Fishy Stories' and discussing ideas for additional magical sea creatures. Making wire drawings to be used as puppets in videos took place in the afternoon session when a continuous stream of non-participants joined the group to try out drawing with wire. While this was disruptive and unplanned, it provided further evidence of the interest in the creative toolkit and in the process of designing and making.

The second morning session was spent making experimental video clips using iPads, which students were adept at doing (**Figure 4.12**). The children and I found it easier to relocate to a corridor space to develop an effective co-design team in what became an ad hoc studio for making 'talking Pegs' videos. Accommodating the workshops, as a visiting researcher in the culture of everyday life at PSCA, required a high degree of flexibility by all involved.

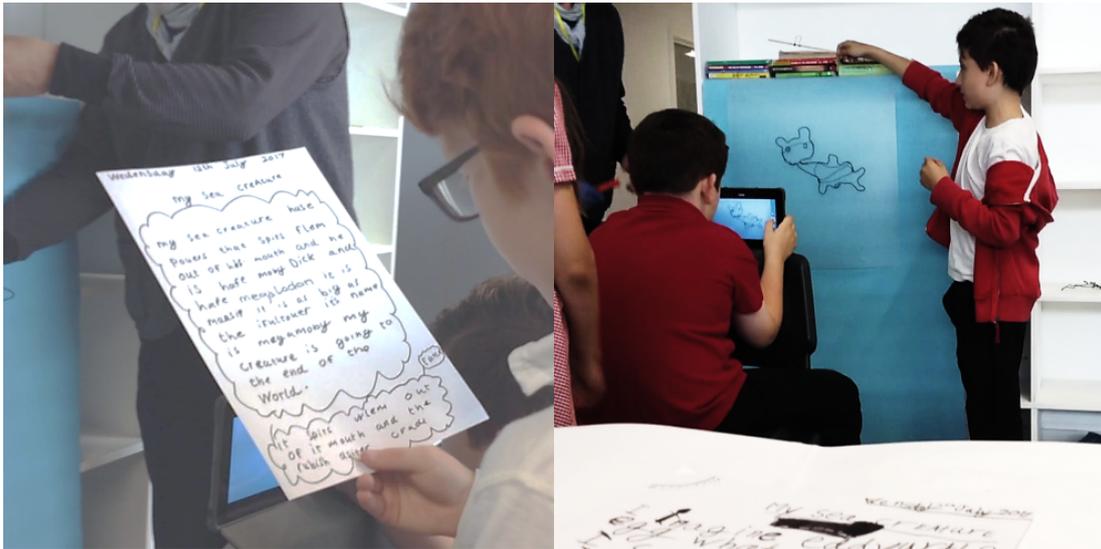


Figure 4.12: Partners working to create ‘Talking Pegs’ videos (July 2017)

Barbetti (2012, p.81) quotes an interview with art critic Roberta Smith:

Art accumulates meaning through an extended collaborative act. ... you put into words something that everyone has seen. That click from language back into the memory bank of experience is so exquisite. It is like having your vision sparked.

Participants were amazed to discover that their sea creatures reflected a research project by scientists at the University of California, San Diego (Lott-Lavigna, 2015), who are reported to have engineered ‘microbots’ that move through and clean sea water, removing carbon dioxide. Although the design brief was framed as developing extraordinary sea creatures with magic powers, the discovery of this information promoted wider student engagement and fostered greater confidence in some children (**Figure 4.13**).

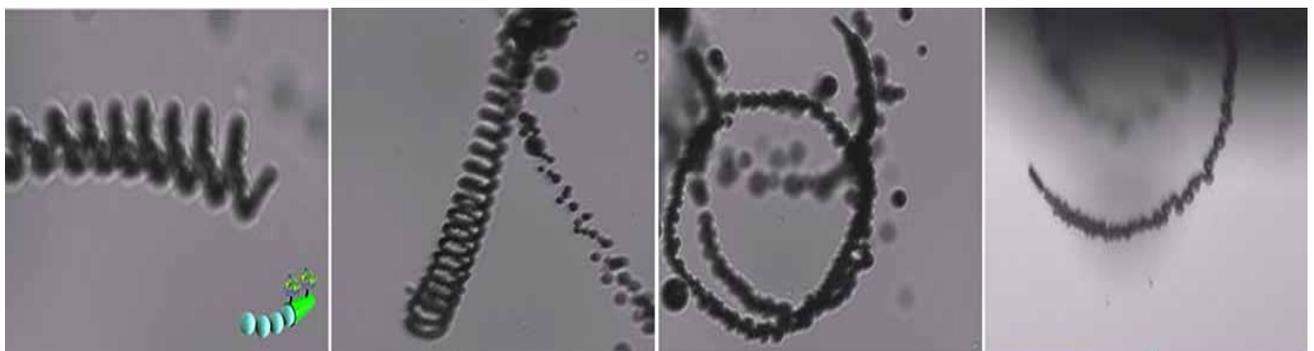


Figure 4.13: Movement of a micromotor in sea water at UC San Diego (2015)

Students expressed a wish to share their story to inspire students from other primary schools to generate ideas related to global issues at the local level: ‘I wonder what children

in another country would do?’ The hope is that children might develop their voices and exchange ideas across continents in the near future.

The drawing and models sparked the imagination of children and provoked visual narrative accounts of things remembered combined with new design ideas through storytelling. Children’s puppeteering went through a process of ‘toing and froing’ between the material domain and abstract conceptualisation. Models were in a continuous process of flux, and there was always the potential for further discovery. Prototypes were ideas in transition (**Figure 4.14**) as children made their video animations.

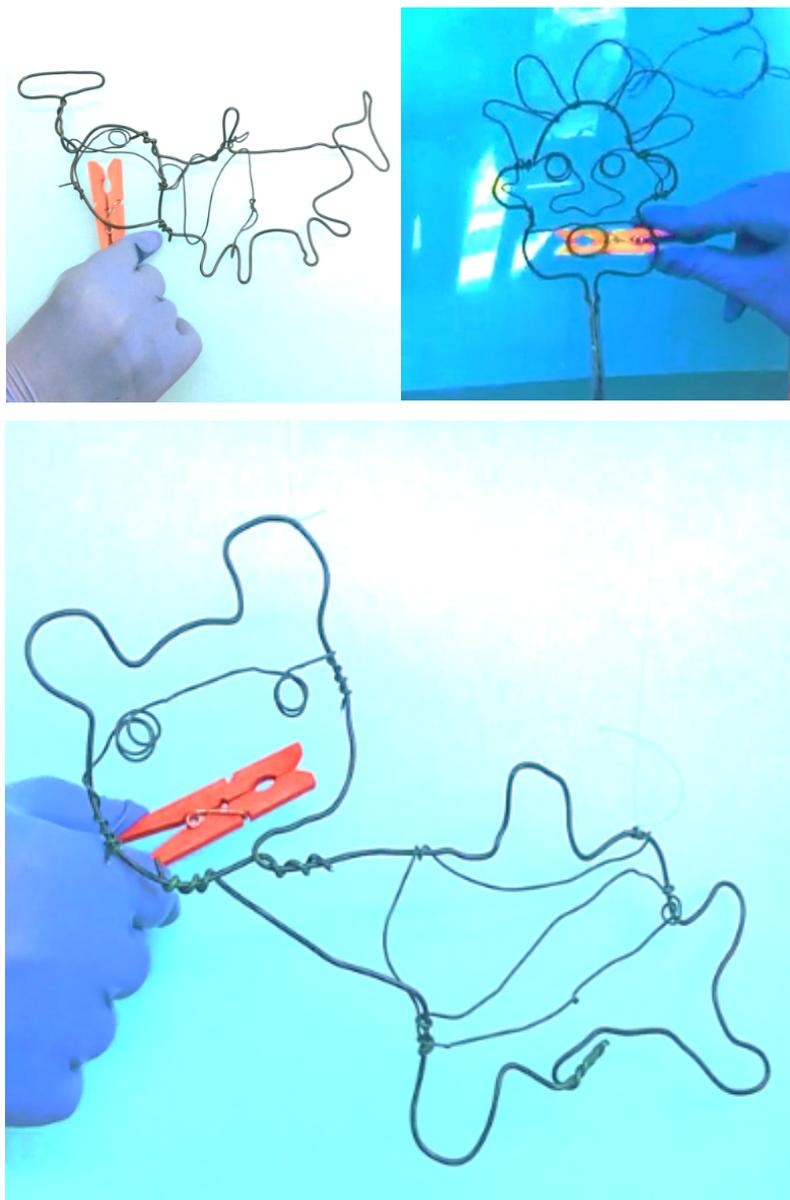


Figure 4.14: Storytelling experiments with wire models of magical sea creatures (2016)

4.2.7 Learning circle reflections

Regular discussions about the project with teachers and senior members of the school gave rise to valuable perspectives and insights which helped me to reflect on and carry forwards what others saw and found important in the workshops.

Andy: The children are loving the project. It's great to see how they are combining making with innovation and storytelling. I think this way of working would also lend itself to science – and particularly to physics. It reflects the ethos of our school.

Me: I have worked on a physics project which combines storytelling and exploring tacit knowledge with a school in London and many good things came out of it. Today we found that 'Life below Water' unwittingly reflects a research project in micro-robotics at the University of California.

Andy: How many schools are you working with?

Me: The project includes three schools in the UK and two overseas – one in India and one in Mexico. The idea is that projects can eventually be shared on an open-source website, and outcomes exchanged across continents and across generations. There have been cases where children have shared their work with parents and grandparents who then continued to work with them away from school. Drawing and making to create stories seems to catch the imagination across generations.

Huw: Macauley's mum said he was very happy when he heard that you were returning to develop the project. I can see how this connects his kinaesthetic skills to literacy and numeracy and the benefit this may have for him.

Me: Macauley is full of ideas and has good making skills. He always helps others when they ask, or when I ask. He stays focussed, is resilient and can concentrate for long periods of time. He also finds pragmatic ways of seeing things through.

Dan: The process and outcomes are very engaging, I have not seen anything quite like it. My research interest is in learning styles and I can see how kinaesthetic learners are telling stories about life in our seas and how they are 'owning' the issues you have been discussing with them.

Me: Metacognition is generating much interest at all levels and may help to nurture agency. Designing, drawing, and making can be used as skills to help children imagine new ideas, reflect upon their ideas and represent their thinking in a physical way. Making their thinking visible means friends and peers can 'see' their thinking and ask informed questions. This helps to make communication and teamwork flow and opens a space for discussion and critical thinking about the purpose and underlying meaning of their ideas.

Mike: Focussing upon the process has great benefits for learning through reflection and revising your ideas. The problem is that it can seem intangible and so difficult to assess – there is no finished 'thing' that summarises what has been achieved to 'tick the box'.

Me: The children involved in the workshops completed 'pre' and 'post' questionnaires as self-evaluation. They articulated why they have changed their position, or not as the case may be. And they are keen to record their development. If an aim is to complete a video, most participants appear to be determined and resilient. Working in pairs and in teams helped to create the ambiance of a studio: "...we are a design team, we work together in the 'studio' and we help one another to achieve our goals."

Self-assessment is supported by recordings and notes taken during critiques, as in higher education, where a tutor leads a formative question and answer session, as an open process of analysis for all concerned...

Venessa: They loved it...

The children's heightened level of engagement and concentration was noted by several people involved in the feedback session and was underlined by the number of non-

participant children who expressed a wish to take part. The transferability of the learning approach was commented upon by a senior academic and the potential for professional development emerged through observation and discussion. Feedback on ‘Life below water’ workshops suggested that participants and teachers feel design and making is an effective tool for thinking and reflecting in primary education.

4.2.8 Self-evaluation questionnaire: workshop two

The second primary workshop at PSCA was redesigned to accommodate unscheduled changes. Children completed the pre- and post-workshop self-evaluations, which provided evidence in support of the workshops as a vehicle for narrative enquiry, developing agency, metacognition and empathy through the global learning goals (Figure 4.15).

life below water: workshop two (4 participants)	pre-to-post scores
how effective are you in a team?	+8
how effective are you at explaining things?	+9
how often do you help others?	+4
how often do you reflect upon your work?	+3
does drawing help to improve your work?	+3
does making help to improve your work?	+5
how good are you at storytelling?	+3
do you try to improve storytelling?	+5
do you enjoy storytelling?	+5
how confident are you about drawing ideas?	+6
do you know much about modelmaking?	+5
how would you rate your making skills?	+6

Figure 4.15: Self-evaluation outcome in workshop two (2016)

Reflections with members of the learning circle included a discussion about the sea creatures as ekphrastic and epistemic objects (Hansen, 2015). I looked for connections between the objects made and their potential for fostering 'good discussion'.

It is noticeable that the self-evaluation of the second workshop, with its emphasis on making models, creating narratives and making videos, included significant change related to teamworking (+8), the ability to explain things (+9) and the level of drawing and making skills (both +6). The process of self-evaluation built the confidence of children to use design and making as strategic tools for communicating innovative ideas. Primary school participants felt that the signature pedagogy of thinking through making helped them to imagine ideas 'about things that matter'. According to Press (2012), 'that's our job as educators, to communicate stories about how passion, self-confidence and skills come together to encourage students to use design to change the world'.

Peers of the participants in the open classroom expressed a wish to get involved with making sculptures and jewellery using offcuts of wire and other materials. A continuous stream of students, throughout the first day, sought my help to make models as gifts for friends and parents. As a result, the concept of a pop-up workshop using ephemeral and found materials from the local area was discussed with students, their peers and teachers, gaining considerable traction. Open collaboration with primary students at PSCA, on the production of models, generated a high level of enthusiasm and some dissonance as one student became agitated because he was not part of the workshop. While I found this disconcerting, it did not appear to disturb or surprise participants.

This incident, and discussion with the deputy headteacher, prompted reflection on the potential for using design and making as a starting point for discussions related to Global Goal 5: Gender Equality. Gender issues are considered sensitive but critical areas of concern in primary education. The use of analogy and metaphor through design and making may give students and their teachers an opportunity to approach complex issues in a non-threatening way.

4.2.9 Epistemic artefacts

Caroline Van Eck and Edward Winters (2005, p.4) contend that the essence of visual experience is its sensory qualities, qualities invariably ignored by cultural theorists. Van Eck and Winters believe that 'there is a subjective feel that is ineliminable in our seeing something ... and appreciation of this feel should be as much part of understanding images as the interpretation of their meaning'. Analysing images and models produced by children meant looking for interpretations and reflecting on their visceral impact. Stereotypes are part of our everyday culture and raising awareness of this may help students to develop agency on the journey to self-actualisation (Maslow, 1954).

Summer: I imagine Cool Cat-egg – why did I say egg? Oh yeah, I found an egg on the beach last week, the beach was called Newquay beach – and I need to tell you about my magic powers. My power is that I eat rubbish and then I poo seaweed and ice cubes ...

Tom: My sea creature has super powers and spits phlegm out of his mouth and he is half Moby Dick and half Megalodon – he is massive and as big as the Eifel Tower – his name is Mega-Moby and he goes to the end of the world ...

The contrast in these stories is noteworthy (**Figure 4.16**). A teacher member of the learning circle suggested:

There is a sense of nurturing, outlined in Summer's story of consuming rubbish and transforming toxic materials through bodily functions into safe and useful materials – this kind of reverse digestive system was a common theme in the work of participants. ... The matching colour of her eyes, whiskers, and tail shows close attention to detail and harmony. The sea creature appears 'trustworthy' and goes about problem-solving with the minimum of fuss and distraction. These characteristics appear to illustrate the maker's wish to act upon the world.

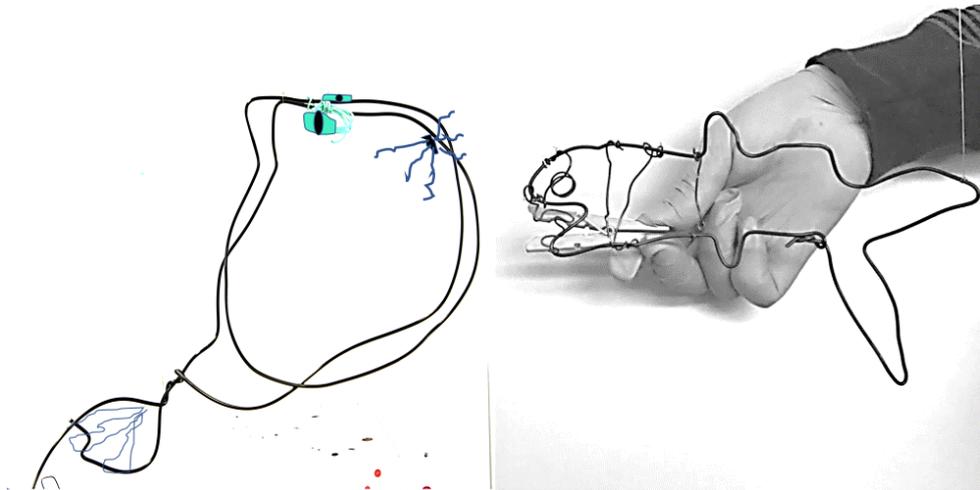


Figure 4.16: 'Cool Cat' and 'Mega-Moby' (2017)

By developing new haptic skills through drawing from her imagination and manipulating wire, Olivia moved between two dimensions and three dimensions to produce characterful sea creatures. Her ability to concentrate for extended periods of time and follow instruction meant she could make and remake her wire sculpture with minimal help once the basic skills had been mastered. 'Rubbish Kisser' indicates a leap of the imagination, bringing together the feeling of fish nibbling at food and the magical transformation of rubbish into sand and oxygen. According to Olivia:

Rubbish Kisser touches rubbish with her magical lips. No rubbish is left behind – she turns plastic waste into sand and oxygen to make the sea clean again. Her friend Hexapus absorbs sunlight through his head, and spreads sunbeams onto the coral reefs. We are helpful creatures ... **(Figure 4.17)**

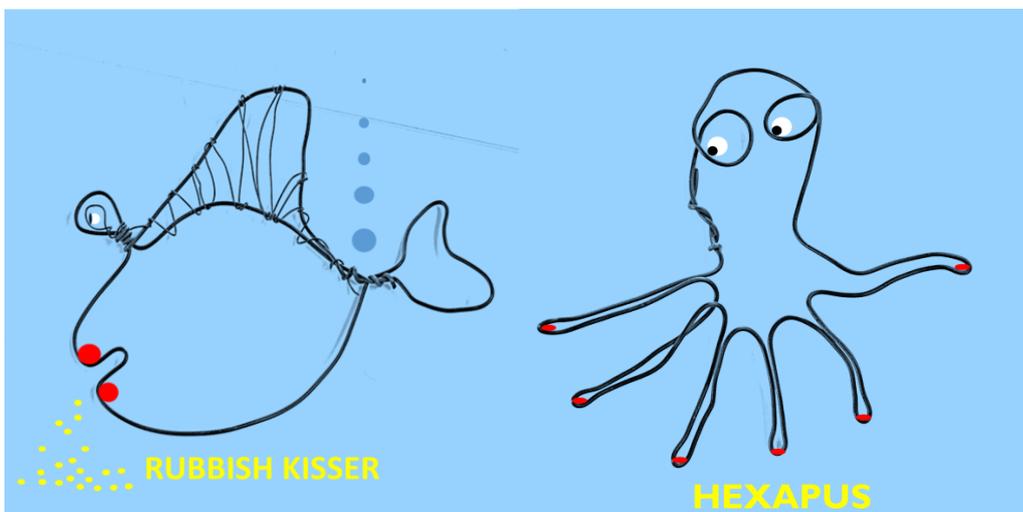


Figure 4.17: Rubbish Kisser by Olivia and Hexapus by Theo (2016)

The fact that Hexapus appears to have no mouth may reflect the fact that he is more of 'a doer' than 'a talker'. The special powers given to the magical sea creatures reflect a series of human characteristics that bear resemblance to digestive processes, enabling primary-aged children to propose solutions to complex problems by combining things that they have witnessed and things they believe to be transformative. Through abductive design thinking, lower KS2 students at PSCA 'transferred' known phenomenon in an innovative way in search for a solution to a local and global environmental problem. The personas developed and adopted suggest that, when acting as designers in the studio, it is possible for lower KS2 students to assume personal agency and to exhibit empathy.

The intention of 'Life below Water' was to develop a methodology which fosters personal agency through creative thinking and making in primary education. Project-centred learning generated tentative findings that suggest signature pedagogies from art and design encourage primary students to engage with the global citizenship agenda while nurturing empathy and self-regulation.

Sharing 'Bags of Fishy Stories' across geographic space gained traction with Helen Hamlyn graduates Shahar and Ventura (17 February 2018):

Great to hear from you Robert :) Indeed the magical sea creatures proved very helpful as a reference point when discussing design and (school) education. Last year one of our graduates developed an Object Based Learning platform for schools. We discussed the Sea Creatures as an example of integrating the very much needed:

- Tactile work with materials (lacking in today's dominance of screens)
- Objects as key elements in generating discussion and collaboration (as in Co-design methodologies objects are used for 'Tangible Conversations')
- Design Education as a catalyst for generating involvement and activism. (the importance of self-expression and interpretation, design as communication).

It is interesting when a project travels and gets a life of its own, how people interpret it and use it.... Best, Dina

4.3 West Dean Primary School workshops

I approached West Dean Primary School as a location for two 'Theatre of the Imagination' workshops in the hope that my previous experience as a governor at the school from 2001 to 2006 would be helpful. Prior collaboration on arts projects with the support of the headteacher and the deputy chair of governors laid the foundation for a trustworthy and productive working relationship. The school received an 'Artsmark Gold Award' from the Arts Council in 2008 for bringing high-quality arts and culture into the classroom, and won the 'Guardian Classroom Innovation Award' in 2009 (**Figure 4.18**). I helped to initiate and support these projects as principal of West Dean College.

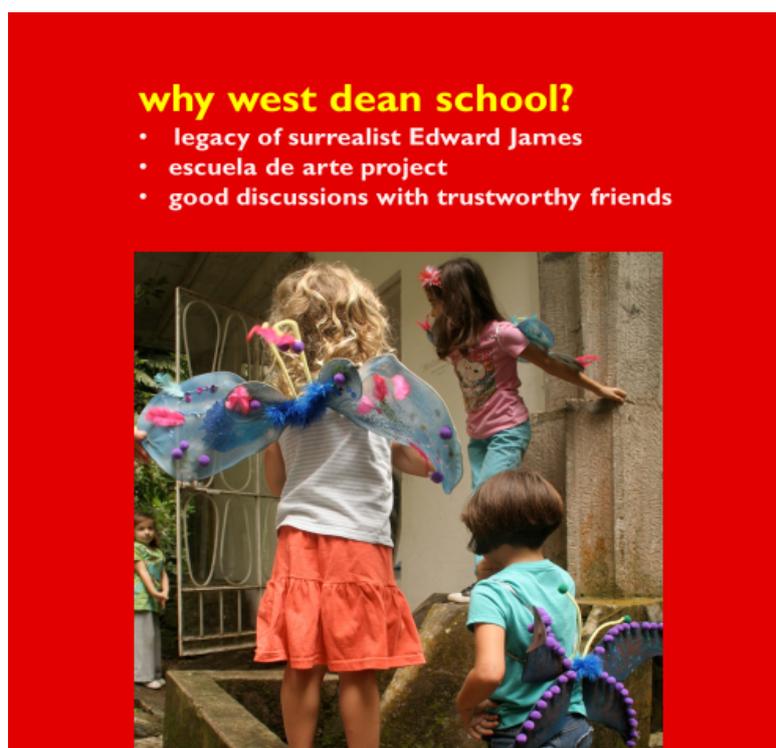


Figure 4.18: Children working on the 'Escuela de Artes' primary school project in Xilitla

West Dean is a small rural primary school of around 100 students. Ofsted (2009) judged it to be a school which provides outstanding education for all pupils through a focus on 'children as individuals and on purposeful, exciting learning'.

In February 2017, parental consent forms were sent out with help from the headteacher and school administrator and these forms (**Appendix eight, p. 255**) were signed and returned to allow me to use photographs of participants and their work in this thesis. The assent of participants, and the consent of an appropriate adult, were secured at the outset.

4.3.1 'Life on Land': workshop one

'Theatre of the Imagination' workshops set out to reflect the local environment of each school. The first 'Life on Land' workshop was planned to run in the garden pavilion over, three sessions, on 15 February 2017 (Figure 4.19). This was followed up by discussion with members of the learning circle and a self-evaluation immediately after the workshop and a feedback session with the primary students and their class teacher a month later. Workshop participants included twelve lower Key Stage 2 students, the class teacher, a printmaker with teaching experience, a school governor, and me as the design researcher.

West Dean pilot workshop: 15th February 2017

- what people say, do, know and feel
- what is to be photographed?
- materials and equipment lists

8.15	Room set up	15 mins	3 group work stations 3 tables for print and materials
8.30	Welcome support team		
8.35	Demonstrate drawing	5 mins	paper and sharpies
8.40	Demonstrate wire bending	5 mins	wire and formers
8.45	Go through timetable	5 mins	check timings
8.50	Break	30 mins	continue prep
9.15	Walking the Gardens	10 mins	children collect leaves
9.30	Welcome children to pavilion	5 mins	the design studio
9.35	Slideshow	10 mins	Chartres and global goals
9.45	Questionnaire	15 mins	pre questionnaire
10.00	Drawing exercise		
	Drawing 1 and 2	15 mins	plain white paper and sharpies select leaves for mono prints
10.15	Break		prepare for printing and making
10.30	Printmaking & wirework	15 mins	mono prints
10.45	Printmaking & wirework	15 mins	wire lengths, beads etc.
11.30	Prepare boards	15 mins	introduce fixings
11.45	Storytelling and performing	30 mins	persona cards
12.15	End		
12.30	Learning circle meeting	45 mins	lunch and discussion

Figure 4.19: Timetable for a 'Life on Land': workshop one.

The intention was to determine how participants perceived change in their level of engagement and skill through the process of designing and making three-dimensional

models, making wire portraits and developing stories using persona cards and wire puppets. 'Life on Land' (Goal 15, 2015) provided the context and 'situation' for the workshop in which students were encouraged to think about their favourite landscapes and to consider how they might care for such a valued location.

4.3.2 The situation

This approach combined PAR, where explicit knowledge related to a global goal and implicit knowledge related to local experience were brought together through participatory design (PD). Children, teachers, artists and designers were invited to explore Global Goal 15: 'Life on Land' and to co-design and make things in response to a seminar and slide show about deforestation and reforestation.

The garden pavilion provided the venue for the workshops. This self-contained space is light and airy and has an external terrace big enough for messy work. The studio environment was emphasised by the interior layout. Banks of tables provided sufficient room along the perimeter walls for tools, a printmaking station and other materials. This space changed the everyday culture of the school environment and direct access to the garden changed the attitudes and 'ways of being' of participants, who felt this was '...very different to school'.

During the introduction, students were invited to complete a pre-workshop self-evaluation questionnaire, which generated discussion and helped raise awareness of upcoming activities. The West Dean workshops set out to consider the specific UN target 'to promote the sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally'. I raised related questions and fostered discussion during an illustrated seminar concerning the UK government's Forestry Commission's (Vidal, 2016) announcement that it had missed its 'trees in the ground' target by 86%. The worst year in a generation, according to the Woodland Trust, signalled a growing disconnect between rhetoric and action. This was a concern that children believed to be a global problem and not a local one, until presented with the Forestry Commission's statistics.



Figure 4.20: Participants working together as partners at West Dean School (2017)

The group size was originally agreed at eight LKS2 children, four boys and four girls, to enable participants to work interdependently and as individuals. The group was extended to twelve by the class teacher, to allow more children in Beech Class to take part, while maintaining the structure of duets and quartets (**Figure 4.20**). To alleviate my concern about additional numbers, a designer-maker with teaching experience was recruited to support printmaking. Her involvement was serendipitous and underlined the importance of having practitioners with good skills and good knowledge supporting each workshop. I felt it was critical to make sure that my limited experience did not unduly impact upon the experience of children and teachers.

Students worked with a partner and in teams of four around islands of tables set up in pairs. The three teams of four were encouraged to work collaboratively, to pool skills and to share knowledge. I explained to participants that in 'Life on Land' we would be working as a design team in a studio workshop. This encouraged co-designing, sharing and listening to the ideas of partners and team members. Children engaged in design thinking, abductive thinking, 'seeing things in' and case transfer (Chow and Jonas, 2010). For example, Noah

wondered, ‘the waves in this leaf remind me of sand dunes at East Head and that’s my mum’s favourite place. How can we protect that?’



Figure 4.21: The ‘bridge’

The bridge is the stage in CLD where connections are formed by children between what they already know and what they are anticipated to learn by surfacing implicit and tacit knowledge (Polanyi, 2009) through dialogue, design and storytelling. The idea of linking ‘Life on Land’ and global citizenship through the global learning goals helped initiate good discussions (Bradbury-Huang, 2015) and linked aspects of environmental science, design, art, literacy and numeracy. Introducing participants to the work of renowned artists such as Alexander Calder provided examples of printmaking, model-making and storytelling that they subsequently interpreted and tried as part of studio practice.

The making began with participants collecting ephemera from the school gardens and playing fields to be used in printmaking (**Figure 4.21**). Once leaves and other objects had been collected, I invited each child to select a character from a set of persona cards, which included illustrations of a gardener, a teacher, an arborist (there is an arboretum at West Dean), a farmer, an artist and a student. Each duet was invited to consider how their new

personas might work together to care for a special location. This prompted questions such as ‘What might happen when an arborist and artist work together?’ (Figure 4.22).



Figure 4.22: When an artist and an arborist got together at West Dean (2012)

tasks

- drawing with sharpies and wire
- printing with leaves and collage construction
- storytelling and video animations

A close-up photograph showing a pair of hands working with a thin green wire. The hands are positioned over a white surface that has some faint, dark lines drawn on it, possibly representing a tree branch or a wireframe. The person is wearing a blue long-sleeved shirt. The focus is on the hands and the wire, illustrating the 'tasks' listed above.

Figure 4.23: Thinking and making tasks

Thinking and making tasks meant I had to anticipate questions to support and encourage students by demonstrating physical making techniques alongside fostering discussions about social and environmental aspects of 'Life on Land' (**Figure 4.23**).

I assembled and distributed 'Bags of Stuff' to the students containing resources for the workshop activities including: 'pre' and 'post' questionnaires; drawing equipment; sheets of cartridge paper; lengths of garden wire; pre-punched corrugated cardboard baseboards for collages; and fixings to be used in the construction of 'assemblages'. The tools and materials were selected to provide unusual and new experiences. Ephemeral materials were used for their affordability and availability in the spirit of 'zero additional cost' to mainstream primary education.



Figure 4.24: Michael Brennand-Wood Collages (©, reproduced with permission, 2018)

Making components and connecting materials required collaboration, repetition, experimenting, and precise haptic skills. The task of making assemblages was informed by the work of artist Michael Brennand-Wood (**Figure 4.24**) and designed to encourage collaboration. Children transformed line drawings into three-dimensional wire portraits of their partners to be used as puppets in video animations in which they created stories about personal experiences in their local landscape (**Figure 4.25**).

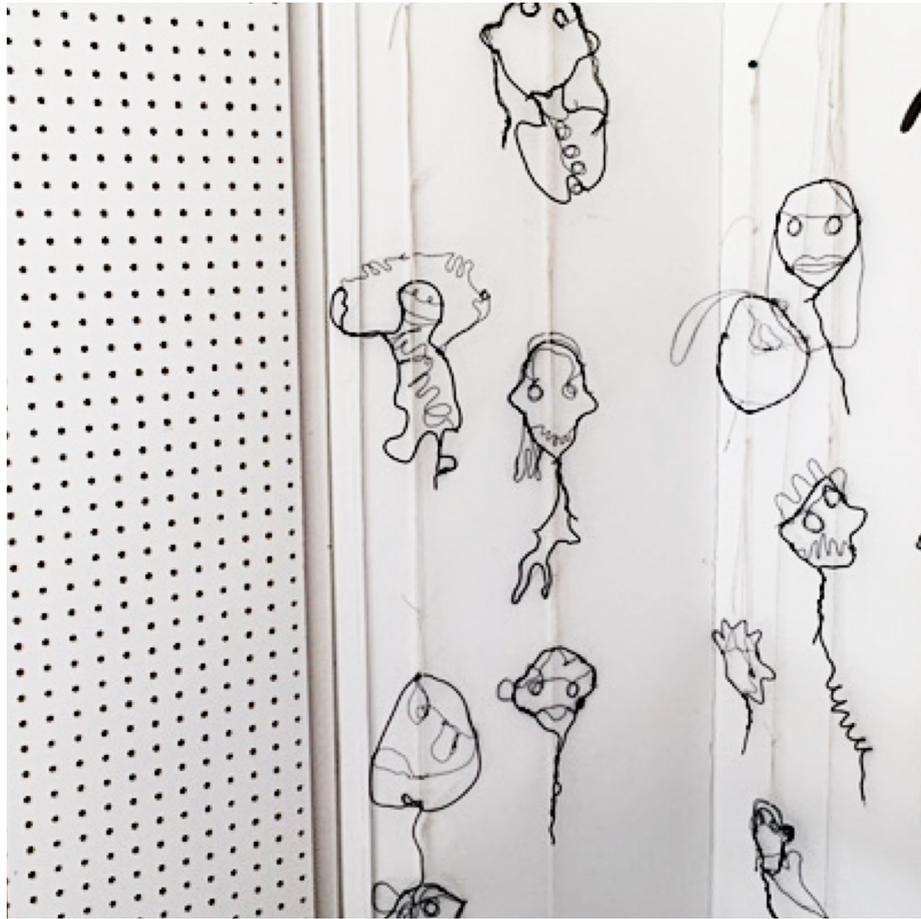


Figure 4.25: Wire models used as puppets by children in ‘Talking Peg’ videos

Participants took part in a series of scheduled activities including ‘drawing without looking down’ and ‘drawing without taking your pen off the paper’ (**Figure 4.26**). These exercises were designed to question student perception of what constitutes drawing and to show how reframing may help to develop thinking skills and proficiency in haptic skills. Primary participants were invited to draw in an experimental way and, according to class teacher Robin Wilcox, this made some children hesitant and others more enthusiastic. He suggested the process of draw and draw again became increasingly expressive and rich in thought.

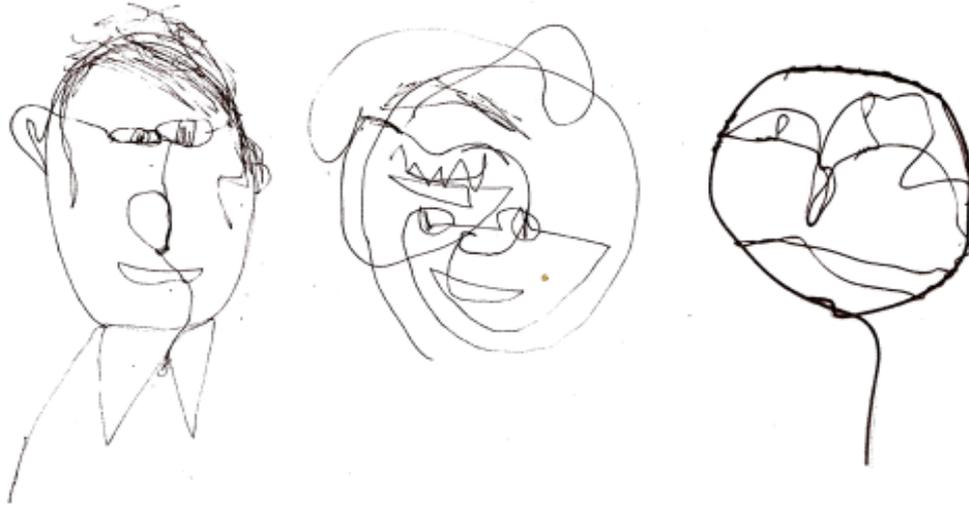


Figure 4.26: Three drawing exercises

Some children found that scaling drawings up required ‘a leap of faith’ as they began by producing very tentative marks. Once engaged in the process they produced drawings that were, according to Indie, ‘a big mess’ and felt by others to be ‘exciting and fun’. Drawing ‘from the mind’s eye’, as Indie described it, was a stretch for many of the group and created dissonance in the studio, but eventually triggered a consensus that ‘you can draw to help you think’.

According to school governor Dr Sharon-Michi Kusunoki, children were gripped when transferring line drawings from paper into 3 dimensions. This simple exercise, a signature technique on art and design foundation courses, appeared to capture the imaginations of participants and fostered new possibilities. The exercise was subsequently very successfully ‘translocated’ to a whole-class lesson at Halstow Primary School (**Appendix three, p. 214**).

In the first West Dean workshop, printmaking ran in parallel with wire drawing and children took turns to produce monoprints and portraits of their partner, before co-constructing assemblages (**Figures 4.27**). The learning circle at West Dean believed the juxtaposition of prints and wire drawings could be used to provoke discussion about ‘Life on Land’ in relationship to the UN global goals in another country. The feeling was that, through the

universal and abstract nature of drawing in two and three dimensions, the project might be translocated across continents and cultures. As a result, the project was translocated to primary schools in Mumbai in October 2017 (**Appendix four, p. 217**). A box of artefacts and a slide show were sent to Dr Ajanta Sen, my research colleague at the Indian Institute of Technology Bombay (IITB), as probes to for translocated practice mediated by postgraduate students. Their spirit of exploration resulted in two remarkable workshops with local primary children.

The prints from leaves collected in the garden at West Dean were designed to provoke engagement with the local landscape and highlight the value of ephemeral materials. According to printmaker Maria Garcia, ‘The expressions of students ranged from quizzical to astonished as they witnessed a transformation, before their very eyes, using things collected from just outside the studio door’. Participants shared and compared outcomes, which helped to build confidence across the studio to take creative risks. Building confidence was a crucial part of my role and learning when and how to respond to breakthrough moments helped foster a climate of creativity in the studio.



Figure 4.27: 3D assemblage of prints and wire drawings in ‘Life on Land’ duets (2017)

Constructing 3D assemblages, in the manner of an ‘exquisite corpse’ (Breton, 1925), where disparate objects are brought together to provoke dialogic discussion, exemplified how artefacts become ekphratic objects, provoking idea generation and discussion about personal experiences related to local landscapes (**Figure 4.28**). As children fluctuated between working individually and working in partnership, they also demonstrated empathy

and care for one another. Partners were paired up, by the class teacher, using friendship or complementary skills as criteria. Independent and jointly considered recommendations flowed from discussions and the emergence of a co-operative spirit was noted by the class teacher, the printmaker and the school governor.



Figure 4.28: Partners working together to construct 3D collages (2017)

I also designed persona cards (**Figure 4.29**) to encourage duets and quartets to look at the world through the eyes of someone able to help protect their selected location in the landscape, such as a gardener, a farmer, an arborist or a schoolteacher.



Figure 4.29: Three Persona Cards (2017)

Participants were then invited to create short stories using five lines of dialogue such as:

Gardener persona 1: ‘My favourite place is the apple tree in my garden because every autumn I climb it and pick the apples.’

Farmer persona 1: ‘How do you look after it?’

Gardener persona 1: ‘My dad cuts some branches off in the autumn ready for next year.’

Farmer persona 1: ‘My favourite place is Thailand because it is beautiful. I like elephants and I would like to make sure there are plants for elephants to eat. I want them to be healthy.’

Gardener persona 1: ‘Does that mean stop cutting trees down?’

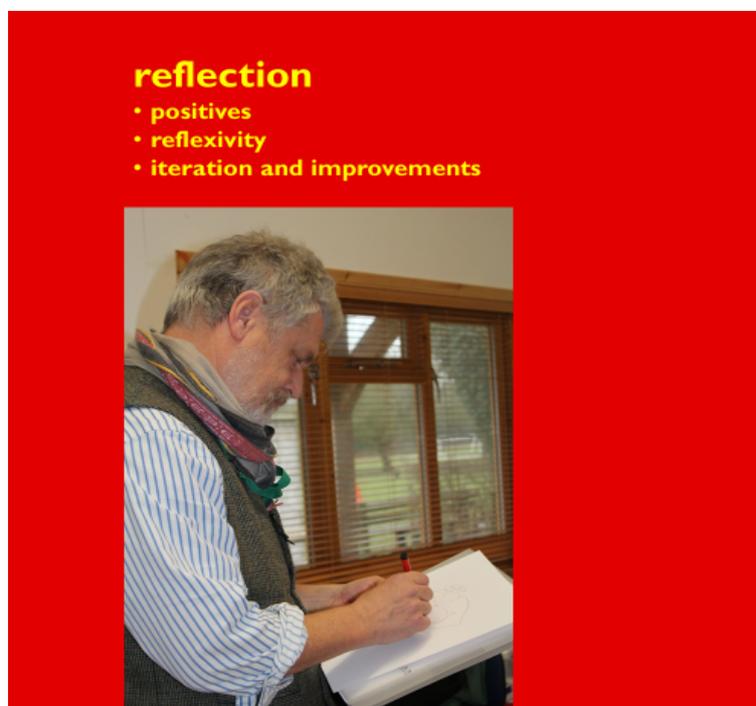


Figure 4.30: I made field notes and drawings during the workshop (2017)

The rich pictures and field notes I made during and after the workshop (**Figure 4.30 and 4.31**) supported reflection. The workshop activities were regularly punctuated by one-to-one and group discussions to support the process of visual narrative analysis (**pp. 164-178**).



Figure 4.32: Children’s work on display in the school encouraged discussion (2017)

Work was displayed in the school hall and discussed with peers and teachers (**Figure 4.32**). Children from across the school asked if they could be involved in future workshops and class teacher Robin Wilcox confirmed there would be a whole-school workshop based on the assemblages of Michael Brennand-Wood later in the term. The children spoke about the ‘Life on Land’ workshop experience with peers, parents and teachers and demonstrated confident and detailed recall of the events and their process of thinking through making during discussions with their class teacher and me. Our task was to elicit meaningful interpretations from children about the stories they had visualised and shared with us. We set out to highlight exchanges that demonstrated agentic actions in the process of learning about themselves, their peers, and the global goals. I believe this relates directly to what Sairanen and Kumpulainen mean when they suggest that visual narrative inquiry sets out to integrate “...a child’s reconstructed past, perceived present, and imagined future.”



Figure 4.33: KS2 students at West Dean drawing and undertaking self-evaluating (2017)

By encouraging the process of discovery learning through design and making, I set out to help children foster personal agency and to develop empathy for peers and respect for their local environment. Members of the learning circle reviewed the self-evaluation questionnaires, drawings, prints, models and stories, and considered that these aspects of learning were evident in the outcomes of 'Life on Land'. To facilitate this process, the evidence was organised as data tiles in an adaptation of the mosaic approach to data collection, presentation and analysis (**Figure 4.33**).

4.3.3 Self-evaluation questionnaires

Teacher Robin Wilcox demonstrated how to go about scene-setting at the pre-workshop stage and how to get pupils to reflect and think about their experiences before filling in the post-workshop questionnaires. The process of working with a competent and experienced teacher enabled me to collect thoughtful responses from lower KS2 children.

Feedback from the self-evaluation questionnaires (**Figure 4.34**) was reviewed by members of the learning circle, by participants involved in the workshop, and by me. The class teacher, school governor and the printmaker were adept at critical and creative thinking and this group of colleagues added great value to the workshop and the process of analysis. Data emerging from the self-evaluation questionnaire, learning circle discussion, photos, artefacts and participants' stories analysis to inform findings and recommendations for further research. Selected evidence, along with my reflections, is presented below.



Figure 4.34: Workshop one – difference between pre- and post-workshop scores (2017)

A sample of twelve participants cannot produce generalisable findings but can present a reliable indicator related to the potential for further research into how design and making may help to develop metacognitive skills, personal agency and global citizenship in whole-class lessons. A positive change in self-assessment scores from pre- to-post-workshop constitutes a positive step forwards. The relatively small move related to storytelling does not necessarily reflect the ability of the participants but does suggest that this aspect of the workshop may require further development.

Class teacher Robin and I felt that insufficient time was given to introducing and supporting the storytelling activity in workshop one at West Dean School. During the critique, members of the learning circle felt that there was sufficient evidence to indicate that reframing the introduction, and allotting more time to developing stories, might help a more diverse range of ideas to emerge. One member of the learning circle suggested introducing haiku to capture the insights of children related to their favourite places; another suggested that the students could be supported to make short videos featuring their wire drawings as puppets to tell personal stories about global goals. The group also suggested that these ideas be shared with international partners as haiku is a well-established form of poetry in many countries. Governor Kusunoki suggested that ubiquitous technologies, such as mobile phones, should be used to make videos and that specialist equipment should not be required in the workshops. Learning circle participants believed that restructuring the workshop timetable may improve the range and quality of outcomes.

Significant differences between pre- and post-self-evaluations may support the theory that young children have an exaggerated opinion of their own abilities (Gullo and Ambrose, 1987). But this does not undermine the importance of the 'felt' degree of change across the group. The greatest improvement recorded in the self-evaluation related to printmaking, and this was corroborated by feedback during 'learning circle' discussion. But a high self-evaluation may reflect the emphasis upon achieving high scores in a metrics-based system of assessment as opposed to reflection as a mechanism for self-awareness. Levine (2012) believes that formal assessment can drive a focus on competition and class teacher Robin and I stressed the difference between self-evaluation and school assessment and explained the purpose of reflection to participants. There was a significant leap in the score related to reflection, which Robin felt indicated "...the potential for improvement in personal agency and metacognitive skills" in the children of Beech Class.

I noted that reflection was in evidence throughout the number of iterations undertaken by participants to complete drawings on paper and drawings with wire. Introducing new approaches to drawing encouraged children to 'try and try again' while thinking about how they might develop ideas in an incremental way. Robin Wilcox explained that the condensed nature of the primary curriculum allows very little time for reworking ideas and he felt that redrawing and remaking encouraged lower KS2 children to reflect and think more deeply.

There was further evidence found in what the children said, and what some members of the learning circle witnessed. Dr Sharon-Michi Kusunoki suggested developing skills and developing design ideas in tandem, within a studio environment, helped to nurture self-efficacy. Kusunoki noted: “Sidney was totally absorbed in the exercise of drawing with wire so that he might tell *his* story about elephants in the Thai jungle.”

Sharon-Michi and I witnessed the positive effect of drawing and making as a method of building confidence and the studio helped foster a climate in which students began to engage in constructive self-reflection (**Figure 4.35**). Luke explained, “I thought the drawing without looking was atrocious, but I also thought it was interesting; it was my drawing and it was not like any drawing I had done before.” His reflections were echoed by other children in other workshops and schools (**Appendices two, p. 194 and three, p. 214**).



Figure 4.35: Beech Class at West Dean School (2016)

4.3.4 Feedback from a teacher and a governor

Class teacher Robin Wilcox (2017) felt it would be possible to transfer aspects of the project into a whole-class experience at lower KS2 in a straightforward way. Other aspects of the workshop could be done with the help of parent volunteers, which he thought would not be difficult to organise.

Dr Sharon-Michi Kusunoki took photographs and videos for the 'learning circle' and fellow governors. She reported that a parent-governor was particularly interested in the idea of fostering agency through design and making. Governor Kusunoki requested a summary report of the workshop for the school board of governors meeting, which prompted an idea, in discussion with the headteacher, of a 'Theatre of the Imagination' workshop for governors, teachers and parents. Dr Kusunoki felt this might be an effective way of recruiting parents interested in getting involved in future events.

4.3.5 Interview with Robin

Children helped to document important moments through drawing, making and dialogic exchange (Sennett, 2012). Each outcome formed one piece of a larger Mosaic (Clark et al., 2003). Gathering material was followed by bringing pieces together for reflection and interpretation. A post-workshop interview with Robin Wilcox, class teacher of Beech Class, generated rich and valuable feedback related to all aspects of the pilot workshop including resources, the space set-up, skills development, cognitive development, scaffolded learning, and confidence building. His comments corroborated many of the tentative points flagged up in the student self-evaluation and provided me with an expert narrative analysis.

Resources:

RW: The studio workshop idea was well resourced, and we had everything we needed for a successful art experience. As a teacher, this makes things so much easier; to use stuff that we can find in the classroom. There was nothing outrageous – the only unusual material was the wire but we happened to have that because we had been working with wire in maths (as a preparatory exercise for 'Life on Land').

The room set-up:

RW: The room set-up with the work stations of two tables, each with four participants organised as two sets of partners, worked very well. I organised the partners in different ways – some were friends and others were one partner with good motor skills and another partner who is very creative.

This did not mean that one of the partners did all the work or made all the decisions. I could see that everyone found their level and made a contribution. The idea you introduced at the beginning of being part of a design studio fired their imagination. Kidding them into thinking this was not a normal classroom worked well. The Pavilion is a great space and they do not use this every day – to set this up as a studio for creative projects would be brilliant – they loved it and it was great to see how they helped each other. I think this worked because there were twelve and not thirty children – they were not distracted or wondering what their mates were doing and then drifting round the room to find out.

Skills development:

RW: The drawing exercises were completely brilliant and flowed really well. The fact that there were three different exercises was great, with one completely out the ordinary (drawing without looking down at the paper). This was a revelation to the children and to me.

These exercises gave them confidence about trying new stuff – it was their piece of work and it didn't have to be a perfect drawing. They enjoyed this and were all laughing at the end – it was great fun. If I had asked them to draw a portrait, then draw it again and then draw it again they would have switched off. Because they were asked to do the same thing in different ways encouraged continuous engagement. If I had explained to them that they had done the same drawing three times in different ways they would have been surprised.

Drawing 'without taking your pen off the paper' prepared them well for drawing with wire. They could see they did not have to keep cutting the wire in order to

make the drawing. It helped them to think about the wire and so it made them aware of the connection between drawing and the 3D wirework.

In a normal class lesson, there is a lot of pressure to do things perfectly and so children are looking at the person sitting next to them and thinking, no, I can't do this; she is so much better than me. But they knew it didn't matter that their drawing wasn't perfect. From a teacher's point of view this makes it very interesting – and it gives me more confidence to try new things without set expectations.

I think the actual printmaking went really well. Normally, when a child is done or has completed an exercise they don't think about their friends work or of trying to help. In the printmaking activity, they were interested in what their partner was doing and wanted to help, that was good to see. I think this would be more difficult in a bigger class. If this lesson was a whole class of thirty then I would need the support of a couple of adults. But we have parents and grandparents who would love this.

Standing on the shoulders of giants:

RW: Having a visual image of other work (Alexander Calder and Michael Brennan-Wood) is helpful. Learning about the global goals and aspects of 'Life on Land' was helpful when it came to printmaking with leaves. When the children were asked to collect leaves from the garden they did not understand why; they thought the task was to collect the very best leaves they could find. Later, when they were working on their prints in the Pavilion, they realised why.

Cognitive development and scaffolding:

RW: The positive feedback you gave about their drawings, which to begin with they were not sure about, helped a lot. Even when they felt that it was not what they thought it should be or what they thought you were expecting. When the activities were broken down, then reviewed, then continued – they got it. When there was a longer discussion some of them forgot where they were but then picked it up again. The activities stretched all the children – even those with good motor skills and creative thinking skills were stretched. Every child got something from the day.

When other children came in to see what they were doing, every member of the group was able to start at the beginning and explain the journey – even those who were not good at art and those who were not very confident at explaining things. All children wanted to talk about it (the workshop). Those children who did not do the workshop were a bit miffed but were happy when I told them they might be able to have a go at some future time.

Development of a whole-class lesson:

RW: If we could link this approach to something we are already doing in the class – like the Romans, we could do it as a whole-class experience, that would be great. We would need to organise the activities as a round robin or break down the morning in four parts: the printmaking; the drawing and making; the persona card stories; and the 3D collage. Those children who printed first were done when the last ones were printing and there was no extension exercise – well yes, the persona cards could have worked better if we had introduced them at the very beginning.

If we had said: “right, children, you are a gardener for the day or a teacher’..” Some got it and came up with good ideas and some of them found it difficult to do. If we made it clearer that the exercise was about character, plot and location, it may have worked better. Getting them to think of a place they knew and liked is a great idea but needed to be introduced at the beginning. We could have led with the persona cards and then introduced the art. You could do this in groups...over two days.

4.3.6 Learning circle exchange

Artefacts (Rose, 2012) may have a different meaning for the author and the observer and this may change over time. Analysis of the work presented includes the thoughts of makers and observers, and my thoughts.

The wire portraits reflected newly acquired skills and projected novel expressions, in some cases with detailed developments to test individual, specific ideas. The following extracts were recorded in rich pictures as quotes and notes, during and after the workshop. The purpose of thematic analysis (Ryan and Bernard, 2000) is to develop a narrative explanation that can account for and accurately describe the phenomena. Thematic analysis aims to

summarise data into themes. The themes implicit in these discussions relate to the rationale and purpose of 'Theatre of the Imagination', namely to determine if design and making can help to develop personal agency, metacognitive skills, empathy for other team members and a care-full attitude towards the local environment.

Governor: The portraits are an indication of how much fun the group had. Their drawings are full of energy and surprise.

Printmaker: I fed off that energy too.

Governor: Yes, to see their faces when they were printmaking was amazing.

Teacher: They liked the idea of working in a design studio.

Me: How did that impact upon the work?

Teacher: When they had their studio hat on they seemed to feel more like a team with a shared purpose.

Me: And what about working with others?

Teacher: Well, they work as partners in class and this gave them a good chance to do that. Working as teams of four extended the discussion and generated loads of ideas, it kind of opened their minds and left things hanging ... in a fun way.

Printmaker: They were determined to produce the prints needed for their joint collage. They listened carefully and improved because they had the opportunity to produce four prints. Not many wanted to get the job done quickly, and they helped each other to succeed. Their interest in the structure of the leaf and the different shapes of the leaves also increased as they tried to improve their prints. This required them to consider detailed technical requirements such as how much paint was sufficient and how hard to roll or press the leaf onto the paper. In most cases, their tactile skills and awareness of touch developed quickly during the session.

Governor: When I was helping Sidney, we made the head using the thick wire, which was quite stiff, and he had several goes at it before he was happy. He wanted to get it right.

Me: What do think that meant for him?

Curator: Getting the shape and the size right. You had asked everyone to fill the (A4) page with their drawings and he was using that as a guide. Some children didn't get the hang of that until their third or fourth try.

Printmaker: Children began thinking about the leaf's position on the page, not just about the process of printmaking, and this was very rewarding for me.

Me: Did they reflect upon their work and then remake things?

Curator: Yes. Sidney (**Figure 4.36**) developed the technique of bending and coiling the thin wire to make the mouth and eyes. Getting to grips with the technique came first. Then he looked at the result with a smile, which became pretty much constant. In the end, his wire portrait looked more like a self-portrait than a portrait of his partner. I am not sure this was a conscious thing, but he seemed pleased with the outcome.



Figure 4.36: Sidney with self-portrait (2017)

Teacher: Some children had trouble with the thicker wire and using the thinner wire gave them more freedom to be expressive. Esther worked hard to create a ponytail hairstyle with the thinner wire. This was important to her, creating a hairstyle.

Me: Indie's thicker wire was bent into a near-perfect circle and fixed with a double twist. The thinner wire was knitted around the thicker wire in a fluent line with relative confidence. The wire depicted hair, eyes, a nose and a mouth. The open mouth gave the impression that the portrait was smiling and it was at that point he suggested to me "...this is bonkers but fun."

4.3.7 West Dean student feedback

Discussion throughout the workshop was consolidated in video narratives as part of the process of visual narrative analysis. The relatively small numbers of participants, and my proximity to the group, made it possible for me to ask children about their drawings, models and self-evaluations. Outcomes from the workshop became central to the process of interpretation as they provided a portfolio of evidence in support of agency, metacognitive skills and declarative knowledge concerning the UN global goals. Using the signature pedagogy of a formative studio 'crit' with children and learning circles was a breakthrough.

Esther: Some people found the thicker wire hard, but I think it was alright. I made the head, mouth and ears with the thick wire and found a way to make a smiley mouth, a bit like a heart, without fixing it to the sides. That was good.

Ashton: My drawing without looking down was atrocious. The drawing without taking the pen off the paper helped me with the wire drawing. I could see how to make the eyes and mouth with one piece of thinner wire.

Kate: The drawing without looking at the paper was a big mess. All the exercises were fun, and it made me think ... this is my work and it's different.

Me: How did you make the drawing without looking at the paper?

Kate: Ummm ... [eyes lit up] I have no idea how I did that ... [laughing]

- Indie:** It was in my mind's eye ... [forefinger touching forehead]
- Stephen:** The Pavilion is great – the rules are different and that makes you think ... cool, designers are lucky if they get to work like that all day. Coming up with ideas isn't work – it's just fun.
- Victoria:** Working with Santi ... meant we could help each other and have fun. I don't think school can always be like this can it?
- Santi:** Making wire models and then doing it again – but different – makes you to think about what you want to do. I found it hard because I couldn't draw until now ... well, now I can a bit.
- Me:** And what about your favourite location outside?
- Indie:** It was amazing when Sidney said he wants to protect elephants in the jungle. We had a great chat about that ...

Feedback from Robin and the children provided evidence in support of developing agency through design and making. Duets and quartets scaffolded learning and became more self-efficacious through the process of design and making. Much emphasis was placed upon 'the studio' and working as a design team and children responded to achieve a common goal which fostered self-regulation.

Thinking about how to achieve a particular design idea demanded second and third-time iterations and so thinking about how to go about a task helped develop procedural skills and to bridge the gap between ideas, drawings and models. The whole group managed to develop ideas about what they wanted to protect and how they might go about doing that. Their ideas were surprisingly diverse, from caring for an apple tree to protecting elephants in Thailand. As new stories emerged so students became more animated.

4.3.8 ‘Life on Land’: workshop two

Reflection on ‘Life on Land’: workshop one was supported by feedback from participants and the learning circle. I summarised agreed actions and valuable ideas, considered feasible, and these informed the second ‘Life on Land’ workshop, based in the garden pavilion, on July 14th 2017 (**Figure 4.37**). This became the standard modus operandi for all workshops.

actions to be considered	learning circle ideas	reflection by researcher	impact on resources	contingency plan
revise timetable	allow more thinking time for ideas	important for establishing agency	reduce the number of activities	interview after workshop
more time for designing assemblages	give students more freedom with materials	support flexibility and design thinking	+15 minutes	extend workshop time to after school session
reduce and consolidate the activities	replace printing with animation	more time for design thinking	no impact	no contingency required
increase the number of students involved	Increase the number of facilitators and students	maintain partners in teams of 4-6	Increase facilitators, materials, and tools	Plan for number of participants available
partners to self-select tables of 4-6	involvement prior to the workshop	importance of student voice	no impact	allow time for this at the outset
record stories and interviews	make more recordings	build agency and citizenship	2 digital video cameras	record after workshop

Figure 4.37: Recommendations transferred to West Dean workshop two (July 2017)

The second ‘Theatre of the Imagination’ ‘Life on Land’ workshop included twelve upper KS2 students at West Dean School and took place in July 2017. The workshop facilitators included governor Dr Sharon-Michi Kusunoki and two experienced primary school teachers from South Korea, Kuk Kuong Hee and Ko Tae Yeon. Actions shown in the table were designed to help the delivery and impact of the second ‘Life on Land’ workshop.

4.3.9 Timetable revision

Some students struggled with the persona cards in workshop one and this was, in major part, due to researcher errors in timing and scheduling. The second workshop was extended by one hour after lunch and ended with the group discussing aspects of environmental stewardship. Video recording (**Videos 8 and 9**) of improvisation including dialogues and storyboards created by partners using ephemeral objects collected from the garden were included as new activities (**Figure 4.38**) and these proved highly successful.



Figure 4.38: 3D assemblages and storyboards (2017)

4.3.10 Maximise the time for design and making

The introduction of plywood grids helped participants to work collaboratively, making assemblages from a variety of ephemeral and found materials in an efficient manner from an early stage. The range of materials was more extensive than in workshop one, and the early discussion around tables appeared to be more engaged. I introduced mnemonics as a metacognitive strategy to help students remember key facts about 'Life on Land'. The group came up with the acronym 'SHADOWS' to memorise seven words related to the social and environmental benefits of forests and woods including: shelter, habitat, agriculture (and arboriculture), diversity, oxygen, water and shade. The success of these tasks is illustrated in workshop recordings (**Videos 8 and 9**), which illustrate how a synthesis of visual, aural, written and kinaesthetic learning tools impact upon the development of metacognition.

Learning circle feedback suggested that 'level of confidence' played a part in successful co-designing and the generation of a creative flow of ideas from an early stage. Colleagues agreed that further testing with lower KS2 children would help to determine whether an open and less structured assemblage approach at the outset of a workshop can help develop declarative knowledge, conditional knowledge and self-regulation across the KS2 range. The process of making 'assemblages' provoked extensive discussion and a degree of dissonance in the toing and froing of ideas in teams.

As stories developed, so did arrangements of materials on the grid. One table of four students worked on two grids in parallel to accommodate several strong storylines that emerged through discussion and idea generation. The session began with extrovert individuals taking the lead. There was evidence that less dominant members of each group remained resilient as teams began to generate ideas and build cohesion. One reason for this appeared to be that everyone was afforded the opportunity to start a new grid if their ideas required more space and flexibility.

4.3.11 Reduce the number of activities

Printmaking was dropped from the timetable in workshop two to allow more time for other activities. Printing was popular in workshop one and will be revisited in future workshops. The forty-five minutes saved was allocated to creating assemblages of found objects in teams to generate stories. The persona cards were also dropped in favour of improvised

video dialogues, using wire portraits as puppets and pegs to animate speech. Taking these creative risks in the second pilot workshop turned out to be a valuable lesson, as noted by governor Kusunoki: “The children were given more creative freedom, which they loved, and that showed in their faces and in the work. When the time came for students to ‘perform’ their animation in duets, other participants fell about laughing, and one took to rolling on the floor” (Figure 4.39).

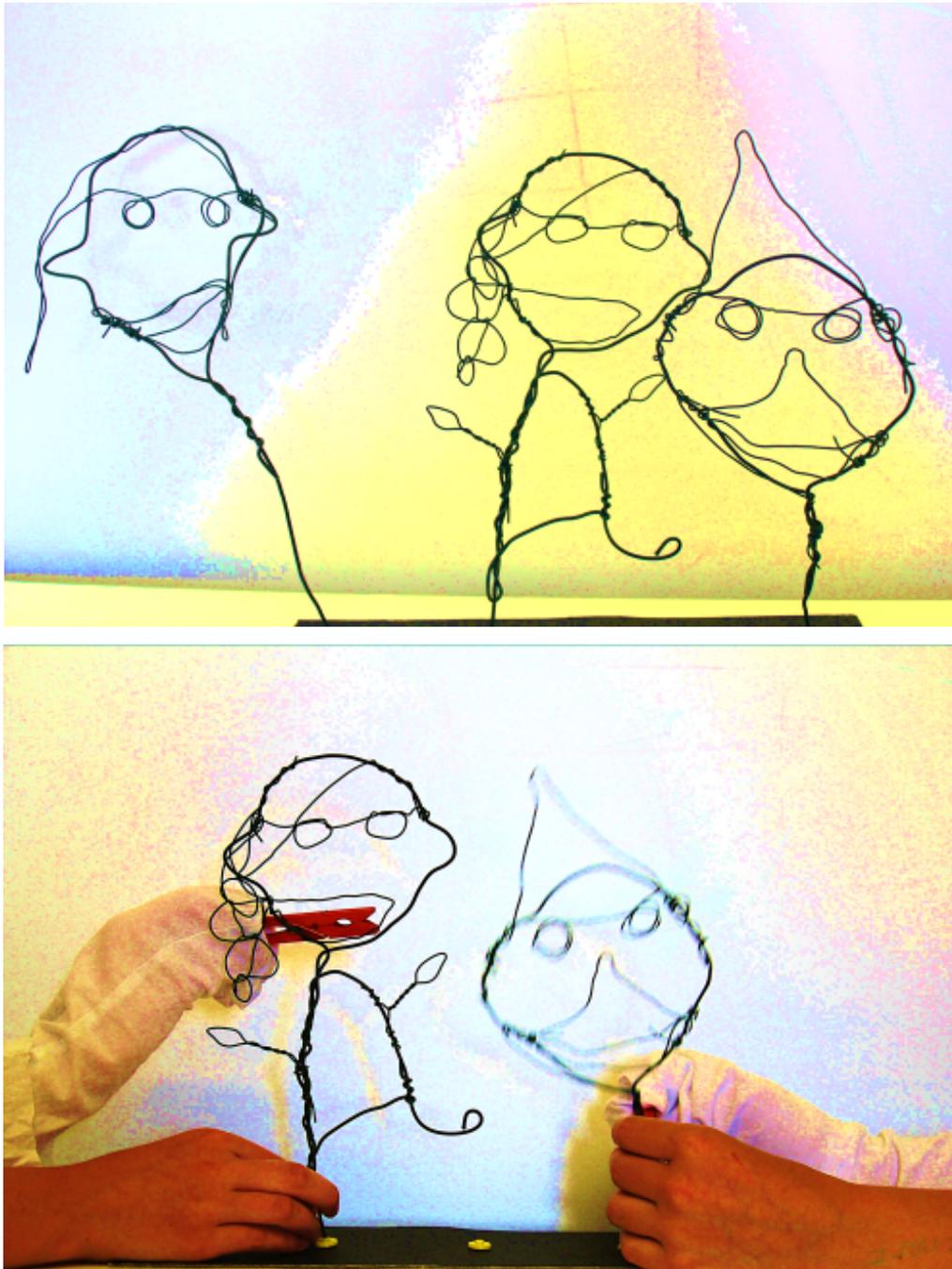


Figure 4.39: ‘Talking pegs’ videos induced great humour (2017)

4.3.12 Increase the number of participants

The idea of increasing the number of participants was based on 'getting closer to whole-class numbers to address issues of scaling', but the final number of twelve upper KS2 participants in workshop two was the same as the number of lower KS2 students in workshop one, because of unexpected late changes in the school plans. Workshop two also had the same number of facilitators, with two teachers in residence from South Korea replacing the class teacher and the printmaker from workshop one. The opportunity to include two primary teachers from another continent was serendipitous and prompted discussion about translocating aspects of the workshop from West Dean to South Korea.

I also learnt that the dynamic nature of the school environment required me to 'go with the flow' and demanded flexibility and resilience on the part of all facilitators and, in particular, on my part as the nominal 'conductor'.

4.3.13 Self-selected teams

The concept of 'classroom as studio' emphasises the importance of synergistic exchanges and of allowing partnerships to self-select. This was considered part of seeking student assent and fostering the 'pupil voice'. Reflecting on the patterns of relationships in the studio also echoes Wood's (2013, TEDx Oslo) observation that four human beings, or a quartet, give six times the 'synergistic abundance' of a duet.

Participant feedback suggested that two sets of 'duets', working together as a design team of four, created many opportunities for discussion, and the teachers in residence from South Korea felt that this could work as a structure for a whole-class lesson. Some participants felt that class teacher Robin's suggestion, to separate the workshop activities into four discrete events, with groups moving through these in a linear way, might impact negatively upon the studio-based nature of the experience. School governor Sharon-Michi, following the children's lead, felt ideas on structure merited further reflection and discussion, within the learning circle, on ways of preserving the synergistic nature of duets and quartets within a whole-class setting (**Figure 4.40**).



Figure 4.40: A self-selected duet

4.3.14 Recorded stories and interviews

Making video animations, using wire figures made by participants as characters, or puppets, increased engagement and fostered a change in the attitudes of children. The UN global goals agenda and the playful nature of improvisation provided a creative platform to discuss the serious subject of conservation to be addressed using humour as a device for storytelling. I found that by ‘letting go’ participants were given greater licence to explore the meaning of global goals in a local context. This generated ‘good discussions’ between children, teachers and me. Being present and participating meant I was able to witness the emergence of a dynamic creative climate instigated by the children through design, making and metacognition. This was a ‘breakthrough’ moment in ‘Life on Land’ (**Figure 4.41**).



Figure 4.41: Assemblages as storyboards creating breakthrough moments (2017)

When Kuang Hee and Tae Yeon gave feedback after the workshop (**Figure 4.42**), they cited an example of how an upper KS2 student was clear, from the outset, that he could not tell stories. At the end of the workshop his confidence had grown as he enthusiastically

explained, 'This is my story ... I told this story'. Through design thinking, making and improvisation the student applied a creative tool and new ways of thinking to help construct an imaginative and amusing story. It was clear that design and making had provoked agentive and metacognitive thinking as the process nurtured self-confidence and self-regulation to produce an engaging and entertaining outcome.

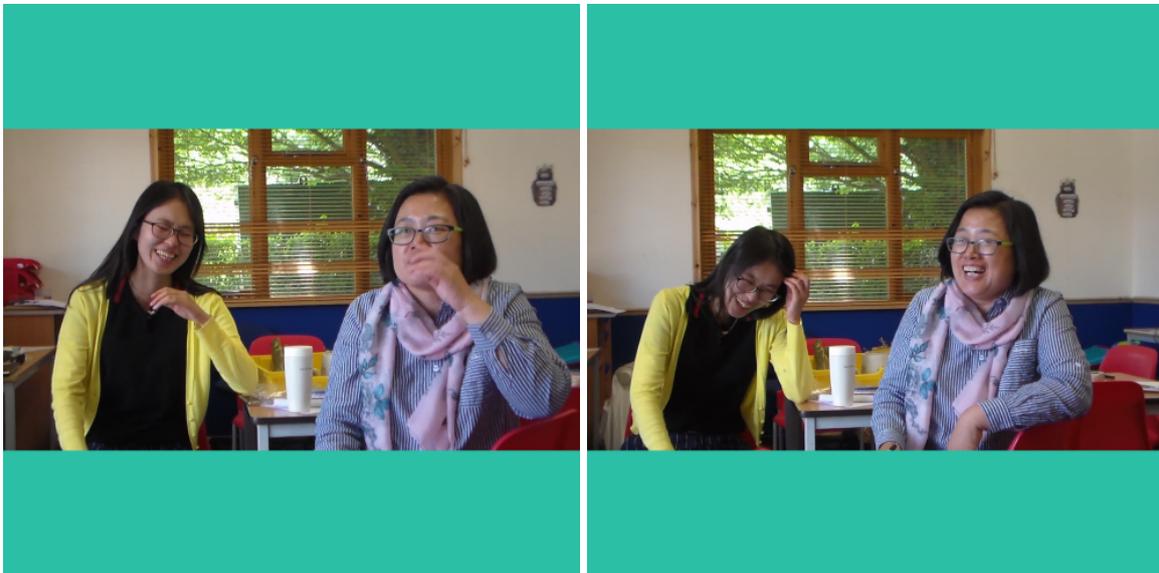


Figure 4.42: Interviewing Kuk Kuong Hee and Ko Tae Yeon, from South Korea

During the post-workshop interview with Kuong Hee and Tae Yeon, it became clear that they felt design thinking and making had brought about a transformation in the perception of the children, as they co-designed their assemblages of found objects, which led to storytelling and the development of an 'authentic' voice (**Video 8**). The teachers in residence also felt that the workshop could be translocated to their schools and that primary school teachers in South Korea have a good degree of autonomy.

4.3.15 Participant self-evaluation

The student self-evaluation questionnaire (**Figure 4.43**) and subsequent learning circle discussion informed data collection, analysis and recommendations for further research.

'PRE' TO 'POST' WORKSHOP QUESTIONS	TOTAL INCREASE
How effective are you in a team?	+4
How effective are you at explaining things?	+3
How often do you help others?	+3
How often do you reflect upon your work?	+7
How often do you try to improve your work?	+5
How good are you at improving your work?	+3
How good are you at storytelling?	+3
Do you try to improve storytelling?	+1
How confident are you about drawing ideas?	+7

Figure 4.43: Children’s perceived learning development in West Dean workshop two (2017)

4.3.16 A summary of the workshops at West Dean

The workshops provided me with compelling evidence that students were developing skills and knowledge which helped to drive metacognitive thinking and empathy. Children reflected on their work and tried new ideas and new ways of doing things. While this worked well in a group of twelve, supported by four adults, it does not mean that it would necessarily work well for a group of thirty students. Robin Wilcox, the class teacher, felt that this transition would be possible with developments and tweaks in the structure and delivery of the workshop. Robin was committed to testing the ‘Life on Land’ workshop with the whole group and felt that he had learnt new skills which would help him explore “...new approaches to learning facts and to developing agency and empathy.”

The activities recorded in the videos illustrate how children use design and making as a way of thinking and as a method of communicating ideas about 'Life on Land'. I was ably supported by four facilitator-participants, each having assumed different roles while sharing some tasks. Translating the workshop into a whole-class lesson was considered possible and desirable by the team.

Reflection on my part and through the 'learning circle' highlighted strengths and weaknesses and informed planning future ways of developing skills and knowledge. School governor Dr Sharon-Michi Kusunoki felt there was an impressive level of concentration by all groups throughout the workshop. The 'learning circle' felt that the role of evaluation in mainstream primary education might benefit students more if it was decoupled from normative and summative assessment altogether, offering a learning culture free from metrics-based testing.

I believe that 'Life on Land' created a studio environment where children let their imaginations roam freely. The national tests are not compulsory in private schools and this offers those teachers the freedom to work as knowledgeable practitioners with personal experience of the needs of their students. I consider the current policy to be undemocratic and demoralising for teachers in mainstream education and a reason why so many are leaving the profession at an unprecedented rate.

Robin Wilcox suggested that it is tricky to foster a culture of independent thinking, compassion and reflection in the highly regulated context in which emphasis is placed upon league tables. Such a positivist approach to education does not help develop reflective thinking or help children to consider what constitutes a worthwhile future life. The 'studio' environment, imported from art and design in higher education, can be messy and uncertain, where values 'stick' in ways that are sometimes difficult to see. Learning through the studio is embodied and enacted, which, in the case of 'Life on Land', means fostering the student voice by making videos of stories told by children in 'Talking Pegs', and through a series of exquisite storyboards (**Videos 8 and 9**).

Participants and I collated data emerging from 'Life on Land' workshops one and two at West Dean related to the main themes of the study to help construct tentative findings in

collaboration with teachers, children and members of the learning circle. During this ‘mosaic approach’ to analysis, children, teachers, members of the learning circle and I discussed and debated qualitative evidence related to the themes and aims of the research (**Figure 4.44**) to arrive at findings and recommendations for future research.

WEST DEAN STAKEHOLDER ANALYSIS	EVIDENCE OF AGENCY	EVIDENCE OF METACOGNITION	EVIDENCE OF EMPATHY	EVIDENCE OF CHANGE IN PERCEPTION
PRE AND POST WORKSHOP EVALUATION	*****	***	**	***
DISCUSSION AND QUOTES	*****	*****	***	**
ARTEFACTS AND DRAWINGS	*****	*****	*****	*****
STORIES AND STORYBOARDS	*****	***	**	**
VIDEOS	*****	*****	*****	*****

Figure 4.44: Findings emerging from data collection and stakeholder deliberations (2017)

4.4 Examples of how visual narrative inquiry nurtures agency

Qualitative data analysis that depends on coding texts can strip much of its contextual richness away (Ayres et al., 2003). To overcome this, I have treated individual accounts of children as ‘case stories’ and accept that such a qualitative approach excludes findings from being considered universal. Visual narrative analysis recognises the idea that knowledge is held in stories that can be relayed, stored, and retrieved to allow insights to be drawn.

4.4.1 Matteo's story

My first example comes from the Halstow School workshop 'Make Your Move' (**Video 5**) held on 9th June 2016 and demonstrates Matteo's sense of agency and capability to help others. In this example, Matteo's visual narration focusses on his 'moving toy automata', from the 'Make Your Move' workshop, made to illustrate how he helped a homeless person. I asked Matteo to explain the meaning behind his work:

Me: What does this describe Matteo?

Matteo: It is about me giving money to a homeless person. I don't know if I did the right thing because he might have spent the money on drink and drugs.

Me: And what are your feelings about that?

Matteo: I think it was the right thing to do, he looked very cold and hungry. When I gave him some money he smiled and said, "...thanks mate." It wasn't much (money).

Matteo was able to explain what he had done and to talk about his feelings concerning the meaning underlying his work. Matteo's visual narrative reflected a strong sense of agency which included an account of his past action, present feelings and future position. When I asked how he might use the new skills he had learned, he said that he explained the project to his grandfather, who he enjoyed spending time with, and they started making a new automata together in his shed. Through his grandfather, Matteo found the 'studio space' and affordances he needed to make things he could not always make at school. He shared his reflections concerning the agency of designing and making with class teacher Isabel six months later:

I felt excited because I knew this story was going to become something more than just my story – a story that everyone could see in 3D and a story that would never be forgotten. Sometimes if you just say something people don't listen, but this was like 'holdable proof.' I felt like if someone saw this, it could affect how they chose to behave and make them want to create something out of their own stories.

4.4.2 Amelie's story

The workshop on 9th June 2016 at Halstow School provided many rich examples of visual narrative. Amelie's automata (**Video 5**), helped her to explain how she developed and

applied drawing and making skills to express feelings about the empathy and understanding she shared with her mother:

Me: How did you come up with these wonderful drawings?

Amelie: I started by making ...er...well, a drawing with flowers and happy stuff. Then you said we can draw 'as if wire was coming from your pencil' – you know, to show how to make the automata - and showed us what you meant. So I started drawing pictures of me and my mum like that.

Me: I see, so you made drawings to explain how to make wire figures?

Amelie: Yes, look (pointing at the at drawings)...this is where I began and this is when I started making the wire ones. It reminds me of how my ideas changed.

Me: You used the drawings to help you see what to do?

Amelie: Yes...(nodding), that helped me.

Me: And how did you go about making the figures?

Amelie: I found bending the thick wire difficult, so Necati showed me how to do it using a pencil and the edge of the table.

Me: How did you feel about that?

Amelie: Good, after a while I got on with it...

The narrative concerning the detail of Amelie's wire portraits provided an example of scaffolding and agency through design and making - of what she could do after making wire models that she had not tried before. She also explained how learning and empathy was born of working with peers with different strengths. Necati explained: "When I finished making the cam box, you said I could help others, so I did – and found it easy and good." Amelie made it clear when she had received sufficient help from Necati and learning when to help and when to let go took awareness and sensitivity on his part. When Amelie wanted to be left to get on, Necati handed the structure back and gave her space and time.

These exchanges, provoked by drawings and artefacts, provide examples of self-regulation and experiential learning in action during the workshop. This successful co-design episode was etched into the memories of both children.

4.4.3 Olivia's story

In the first workshop at Plymouth School of Creative Arts, held on 18th October 2016, Olivia demonstrated her ability to generate design ideas when exploring problems related to plastic waste in our oceans (p. 127). Her way of thinking suggests that she believes technical solutions can help to answer human-created problems in a positive and systematic manner. Olivia synthesised the declarative knowledge she was given concerning a specific global goal with the drawing and making skills introduced as procedural knowledge at the beginning of the workshop to demonstrate her agency. Through drawing, making, and re-making Olivia demonstrated strategic knowledge through her ability to select what she believed to be an effective solution:

Me: ...that's helpful, can you explain Rubbish Kisser to me Olivia...

Olivia: I like tropical fish, their 'roundy' bodies and big eyes...and their lips move like they're kissing something in the water.

Me: Can you remember how you came up with this idea?...

Olivia: Yeah...my mum kisses me when I fall over and stuff...that's like magic, right?

Me: Yes, that's kind and like magic - do you think Rubbish Kisser works like that?

Olivia: Ummm...I don't know, there's no such thing as magic really, is there? (looking toward the Kodama table)...perhaps I can learn how to make magic things because they learned how to make that computer game...and I could not make this (Rubbish Kisser) until now...

Olivia explained the story 'behind' her design and making. Her account indicates that she understands it is possible to do new things tomorrow because she remembers that she had not tried making 3D wire models yesterday. This illustrates how thinking and making has mediated Olivia's sense of agency and her conception of what is possible in the future.

4.4.4 Macauley's story

In the same workshop, Macauley explained how a combination of making physical models using wire and playing with the Kodama digital animation software made him think about what developments might be possible in the future:

Me: Can you explain your new ideas about making figures for the Kodama 'Under the Sea' video game?

Macauley: Well I like my model more than their figures and thought - if I could use my idea instead then it (the design) would be more...from me.

Me: How do you think that would work?

Macauley: ...whatever is in their blocks can be put in mine...or perhaps the camera can be used to scan 'Pugashark'...or maybe they can show me how.

Macauley's reflections on what might be a new development shows reflective and agentic thinking. He understood that we were testing ideas and that he had licence to add his thoughts to how we might improve on the current state of things. Macauley exploited the cultural expectations and opportunities made available in the 'design studio' and came up with an exceptional 'case transfer'. He also sensed that, with the right support, the possibility of a new invention was within his grasp.

4.4.5 Summer's story

Summer took part in the workshop on 18th October 2016, and was inspired by the UN global goals concerning plastic waste in the sea and remembered finding what she believed to be turtle eggs on Newquay Beach in Cornwall. Summer designed two exquisite sea creatures in response to an idea she had imagined related to 'digesting' plastic to make seaweed. The first was 'Cool Cat', and is featured in the account of workshop one (p.127). In relationship to her second sea creature, it is worth noting that her baby brother's name is Eddy:

Me: Tell me about this one (pointing to Eddy-turtle) and the story you have written.

Summer: Er...okay. Eddy-turtle is a magic creature. I saw some turtle eggs on Newquay beach – that's where a seagull was holding a plastic cup in its mouth -...he (Eddy-turtle) eats waste plastic and then poos seaweed to catch sunlight and make food for other animals. Eddy-turtle wants to build homes for his friends.

Me: That sounds fantastic, how long do you think that would take?

Summer: Not long because he poos a lot.

Summer appears to have made Eddy-turtle the alter-ego of her baby brother when she says he wants to build houses for his friends and poos a lot. Memories of vivid episodes in her life have prompted her to think abductively, combining two disparate aspects of her experience into one magical creature. People and events have combined to foster agentic thinking, manifested in the form of her wire models and creative stories.

4.4.6 Michael and Emma's story

In the spring term of 2017, arts co-ordinator Isabel asked two participants at Halstow about their ideas for linking with a school in India through the global goals. They summarised their thoughts and created a short animated duet using 'Talking Pegs':

Michael: If we were to link with children overseas what would you like to know about their country?

Emma: ...I would like to know about their culture, what they do for fun, and how they celebrate. I'd also like to know about their religion and if they pray in churches, or if they pray at home.

Michael: It would also be very interesting to know what they eat and how they eat...

Emma: If you were to choose one global goal (to focus on), which one would you choose and why?

Michael: ...it would be to reduce inequalities because in some countries they take their qualities for advantage (sic) – having clean water, having food for breakfast, lunch and dinner. What do you think?

In this exchange, Emma and Michael expressed their desire to learn something new and explained their feelings related to UN global goal 10; reduced inequalities. The children used hand-made puppets to put themselves 'in the frame' as narrative inquirers on a subject about which they exhibited declarative knowledge and understanding that other perspectives exist in the world. They expressed a palpable sense of agency when discussing learning more about the lives of children overseas and contrasted a potential future position with their present state. During this process, they also reflected on what was

possible to participate in and influence. The ‘Talking Pegs’ video (**Video 6**) illustrates a firm grasp of their ability to act in the world beyond the classroom.

4.4.7 Kai and Kate’s story

On July 14th 2017, teachers in residence Kuang Hee and Tae Teon helped me to run a ‘Life on Land’ workshop at West Dean. Children were invited to collect ephemeral objects from the garden to be used in 3D assemblages as visual representations of stories related to global goal 15. The children worked in duets and quartets and one account of a 3D assemblage went as follows:

Kai: So this one here is Adam’s eye...and this is the first ever bird in the world.

Kate: This is the first ever flower...

Kai: And that’s the first ever apple that fell off the tree...

Kate: (laughing) And that’s the first ever strawberry...

Kai: Yeah, so that’s our story, Adam’s garden (looks up and suppresses a smile)

Kuang Hee explained to me in an informal interview (**Video 8**): “I think I can take your ideas from today’s class into my school.” She went on to explain, “At the beginning of today, Kai said he could not tell stories...but at the end he was very happy about the story he had created with his friends.”

Through the process of design thinking, making and improvisation, Kai and his team used the assemblage board to co-construct an ‘alternative’ garden of Eden story - perhaps because West Dean is a Church of England School. He explained, “When we collected stuff from the garden I did not understand why, but when we made the storyboard it made me think differently.” Kate continued, “ We could actually see the story coming to life on the board in front of us...Bible stories can be boring but...” Kai smiled and asked, “Can you imagine seeing the first ever strawberry?” When I asked if they enjoyed this way of storytelling, Kai replied, “I thought I couldn’t tell stories but...I can do this.”

The children’s sense of agency was expressed in terms of being able to do something; knowing how to do something; wanting to do something; having the possibility to do something; and feeling, experiencing, and appreciating something (Sairanen and

Kumpulainen, 2014). Together, in the garden pavilion, we experienced novel ways in which children and teachers can interact in the socio-technical context of ‘the studio’. The workshop highlighted possibilities created in this context concerning how children explore ideas to serve personal and collective ends.

4.4.8 William and Ben’s story

During the workshop with upper KS2 students on 14th July 2017, the children at West Dean School took ownership of the ‘Life on Land’ workshop and began to revise the timetable to accommodate a session of surreal storytelling using the ‘Talking Peg’ puppets (**Video 9**). The level of agency and ownership that blossomed was a break-through moment:

William: (in a David Walliams-type accent) Hellowww, I am Bob.

Ben: (West Country pirate-like accent) And I am Barrrbaraaaarr...we met on a public road threwww Jersey, didn’t we?

William: Yes, and...

Ben: (interrupts and drifts into Texas drawl) And I took you to MacDonald’s and we fell in love, I had Chicken McNuggets and you had a Big Mac...

William: (laughing) I chose a Big Mac because I am a big boy.

Ben: (laughing) I chose McNuggets because I’ve got a brain the size of a nugget (children laughing in the background) ...then again, I like someone with a brain the size of a nugget (everyone laughs).

Improvised, irreverent stories were created by children using wire puppets that demonstrated their agency and extraordinary insights related to aspects of everyday life – in this case the globalised nature of food production.

4.4.9 Ben and Victoria’s story

In the following ‘Talking Pegs’ video, William and Victoria swap places and Ben remains with his puppet portrait for a second ad-lib performance about a local cycle path.

Ben: (dodgy American accent) ...were you on your tricycle when you cycled there? (children laughing in the background)

Victoria: (quiet, reticent voice) Yep!

Ben: (chuckling while continuing with an American accent) I don't have a tricycle but I have a unicycle (children's laughter getting louder). My unicycle is hard to ride because it's only got one wheel (children laughing loudly)

Victoria: (louder voice) Can I try?

Ben: Nope. (a child rolls on the floor with laughter)

The children took control and performed comedic scripts by connecting stories from home with thoughts that came to mind during ad-lib recording 'Talking Pegs' videos (**Video 9**). In the morning session we had discussed the connection between making 3D assemblages and the surreal game of exquisite corpse. Ben explained that he felt the 'Talking Pegs' workshop was an opportunity...to try something new and fun." Victoria explained that the pavilion space encouraged the group to try "crazy things" and that their self-portrait puppets made storytelling real "...in a strange way." I sensed the children had grasped an opportunity to take responsibility for their learning. Ben explained, "...you said we were running out of time and I knew we could do it, so I went for it." The discussion with Ben and Victoria suggested that the affordances in the pavilion and the making skills they had developed gave them the opportunity to 'perform' personal stories with imagination and enthusiasm.

4.5 Learning circle evaluation

learning circle scores	agency	metacognition	global learning	change in self-perception of children
Halstow workshop one	*	**	**	**
Halstow workshop two	**	***	****	**
PSCA workshop one	*	**	***	**
PSCA workshop two	**	***	****	***
West Dean workshop one	*	**	***	**
West Dean workshop two	***	****	*****	***

Figure 4.45: Learning circle evaluation of key workshops (2017)

Members of learning circles took part in critical evaluations of the workshops to determine their perception of the impact on aspects of learning related to the main themes of the study (**Figure 4.45**). The evaluations provided evidence suggesting the creative toolkit helped to accelerate learning and raised issues for further thought and action:

- The impact related to metacognition and the global goals was high across the board.
- Second workshops in each school were perceived to have a higher impact.
- The agency of the teachers and researcher improved over time.
- Nurturing agency had a high impact on learning about global goals.
- The perceived change in pre- and post-self-evaluations by children was significant.

In the process of PAR, feedback from participants and stakeholders fed into the process of review and revision. Planning, acting, and reflecting in collaboration with stakeholders helped to improve the creative toolkit and the introduction of signature pedagogies.

4.6 Creative toolkit as new knowledge

The creative toolkit provides new knowledge that addresses the question “**How can creative practice help nurture personal agency and empathy in mainstream primary education?**”

When planning and organising primary school workshops, based on Constructivist Learning Design (CLD), I also designed and developed a series of physical learning tools to be used in each workshop and related to a specific global goal.

Selecting participants was purposive (Robson, 1993) and led by the teachers who helped ensure children were enthused by the idea of taking part. Primary schools were also the subject of purposive sampling, selected for their high level of engagement with the arts. Although there was a limit set on the numbers of participants, dictated by logistical considerations, the eight workshops provided ample data to address the research question.

The phenomenological research technique of bracketing (Giorgi, 1988) was achieved through questionnaires, viewed and interpreted in collaboration with members of the learning circles, and through field notes in which presuppositions were addressed by reflecting on the data immediately after each event. Diverse perspectives were collected to improve the interpretation and perception of artefacts, including dialogue during and after the workshops. Reviewing videos and audio recordings helped to triangulate evidence across the series of workshops.

Addressing the aims of the study is a significant factor in data saturation (Fush and Ness, 2015) and while there are no rules governing data saturation, general principles include enough information to replicate the workshops, and data emerging becoming repetitive. Project centred learning flourished in response to the children’s capacity for creative thinking and their skill in making. The resulting artefacts stimulated a myriad of insightful exchanges with children and members of the learning circle.

I have learnt, through the workshops, that metacognition and agency are two sides of the same coin and that creative practice fosters metacognitive skills and agentive action. Creative tools have been successfully transferred across geographic space, nationally and internationally. My research demonstrates how creative practice provides a ‘flux’ for numeracy, literacy and science in mainstream primary education. When the creative toolkit is applied in the context of the UN Global Goals, children are able to demonstrate their

capacity for empathy within this 'third culture', where science is brought to bear upon human stories to create artefacts through design and making.

The most significant new knowledge is embodied in **the creative toolkit and its associated workshop processes** which is based upon constructivist learning design and transition design. The combination of creative toolkit and constructionist process enabled me to question findings arising from the EEF research framework (**Figure 2.2, p.49**) which declares that the impact of the visual arts on improving learning remains unproven. The framework also suggests metacognition, feedback, and peer tutoring are key methods related to accelerating learning and these are synonymous with 'Theatre of the Imagination'.

Finding space and time to experiment, and to nurture the trust of teachers at a time of political and economic uncertainty, is a fundamental difficulty in relationship to the issue of developing creative practice in mainstream education. Inigo Retolaza Eguren (2011) believes that strategic planning for the mid-term, using an adaptive and iterative model, is core to bringing about change. Eguren suggests we explore options for multi-actor collaboration. As opportunities for collaboration between primary schools and higher education in the UK and overseas increases, the potential to pilot workshops across geographical and cultural boundaries is enhanced. Current political and social factors, in tandem with a technology-fuelled global learning agenda, has created a dynamic educational ecosystem which has the potential to benefit from change through transition design and translocated making.

Tim Ingold (2013), raises the case of kite flying as an example of the 'dance of agency'. In his example, Ingold introduces a third element, namely the air, to explain how the kite acts upon the human flyer as well as how the flyer acts on the kite. The dance of agency becomes a three-way 'dance of animacy' in which the flyer, the kite and air 'correspond'. In 'Theatre of the Imagination' the third element is found in 'correspondence' developed between partners and teams in the 'design studio'. The following tables (**Figures 4.46, 4.47, 4.48**) illustrate how three of the creative tools generated evidence in support of how creative practice nurtures agency and empathy in primary-aged children.

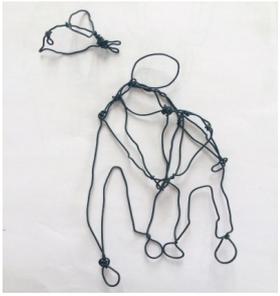
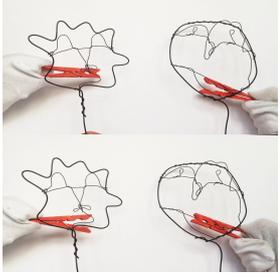
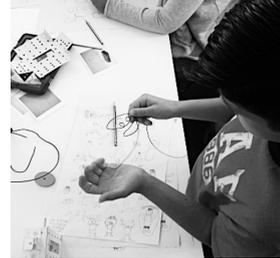
<p>CREATIVE TOOL No. 1, Automata: Halstow School, Workshop one: 'Make Your Move' Date: 27.11.2015 Participants: four children (aged 8- 11yrs), class teacher, and me as researcher</p>	<p>QUESTIONNAIRES</p> 	<p>INTERVIEWS</p> 	<p>VIDEOS AND PHOTOS</p> 
<p>AGENCY Developing participatory skills and learning how to get the best out of a group helps to nurture self-efficacy and self-regulation</p>	<p>How effective are you in a team? Scored +10 in the post workshop self-evaluation. How often do you reflect upon your work? Also scored +10.</p>	<p>Amelie: (supported by others) "I couldn't believe we would make such amazing things from rubbish – stuff you could find just lying around in a corner or in a rubbish bin..." Erin: "The thing about using rubbish is you don't mind messing about – you can easily change it."</p>	 <p>Talking Pegs video shared across the network</p>
<p>METACOGNITION Children think about thinking and make drawings and models based on declarative, procedural and conditional knowledge</p>	<p>How effective are you at explaining things? Scored +10 (pre to post). How confident are you about drawing? Scored +10. How much do you know about automata? Scored +10. How would you rate your making skills? Scored +5.</p>	<p>Charlotte: "Every child saw their drawings improve ..developing expression on paper... producing wire-drawings of animated poses ...we could see good ideas and thinking developing in all four children."</p>	 <p>Learning through making</p>
<p>EMPATHY Exploring what links us to other people and the nature and equality of relationships by 'walking in the shoes of another'</p>	<p>Children reflected upon life experiences, related to helping others, as a starting point for designing and making automata. The post-workshop assessments suggests reflection increased by +10</p>	<p>Matteo: "Is it right to give homeless people money?" Amelie: "...my mum has a unique way of making me feel better...she just knows how I am feeling..."</p>	 <p>Learning and performing</p>
<p>WAYS OF BEING Changing a mental state and position requires a macro account and reason to think and act differently.</p>	<p>How often do you help others? Was scored higher by all participants than the question: How effective are you in a team? Helping others and working collaboratively are two distinct categories...</p>	<p>Participant discussions included: how to end poverty; how to ensure equitable quality education; how to reduce inequality.</p>	 <p>chatting with others</p>
<p>REFERENCES</p>	<p>Appendix two (p.202)</p>	<p>Appendix two (p. 212) Chapter 4 (pp. 164-173)</p>	<p>Videos 3,4,5,and 6</p>

Figure 4.46: Blueprint Exchange learning tool no. 1: 'Make Your Move'.

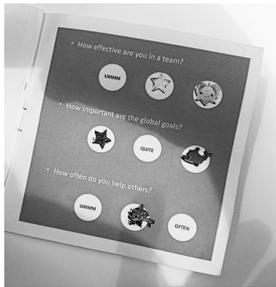
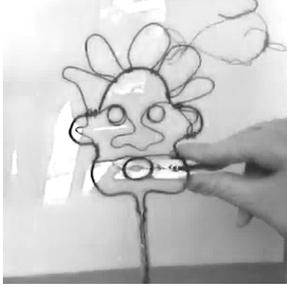
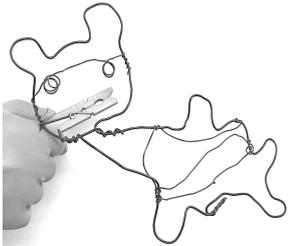
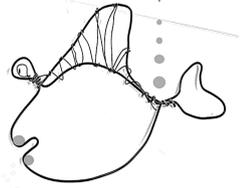
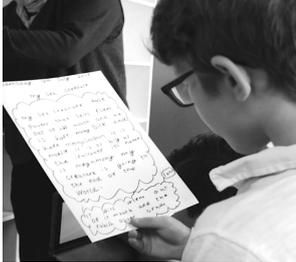
<p>CREATIVE TOOL No. 2: Magical Sea Creatures. PSCA, Workshop one: 'Bags of Fishy Stories' Date: 18.10.2016 Participants: eight children (aged 7-8 yrs), one tutor, two designers, and me</p>	<p>QUESTIONNAIRES</p> 	<p>INTERVIEWS</p> 	<p>VIDEOS AND PHOTOS</p> 
<p>AGENCY Developing participatory skills and learning how to get the best out of a group helps to nurture self-efficacy and self-regulation</p>	<p>How effective are you in a team? Scored +7 in the post workshop self-evaluation. How often do you reflect upon your work? Scored +6.</p>	<p>Macauley: "...drawing 'helps you see if it's right ... if it matches your ideas'. Summer: "...making sea creatures means sometimes you see how the magic power is supposed to work... but if you are not sure then you can ask'.</p>	 <p>inventing sea creatures</p>
<p>METACOGNITION Children think about thinking and make new drawings, models based on stories, new declarative and new procedural knowledge</p>	<p>How good are you at improving your work? Scored +6 (pre to post). How would you rate your making skills? Scored +7. How much do you know about animation? Scored +7</p>	<p>Huw: "The group found the combination of physical and digital making fun to engage in. For some children, software is not always that easy to use...making three dimensional models in wire stretched their thinking and making skills."</p>	 <p>storytelling</p>
<p>EMPATHY The focus is on exploring what links us to other people and the nature and equality of relationships by "waking in the shoes of another"</p>	<p>The post-workshop self-assessments related to How important are the global goals? Scored +22.</p>	<p>Tom: "How do you get someone to stop doing what they already know is wrong?"</p>	 <p>knowing global goals</p>
<p>WAYS OF BEING Changing a mental state and position requires a macro account and reason to think and act differently.</p>	<p>The learning circle felt that the children's improved self-evaluation related to teamworking, combined with the importance they placed upon the global goals, signified a change in perception.</p>	<p>Macauley compared sea pollution to 'careless driving' – not thinking about the consequences your behaviour has on people and the environment.</p>	 <p>chatting with facilitators</p>
<p>REFERENCES</p>	<p>Chapter 4 (pp. 109-110)</p>	<p>Chapter 4 (pp. 111-118)</p>	<p>Videos 11 and 12</p>

Figure 4.47: Blueprint Exchange learning tool no. 2: 'Bags of Fishy Stories'

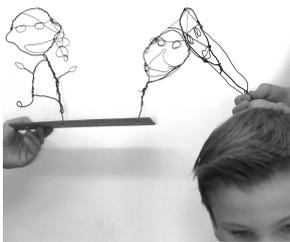
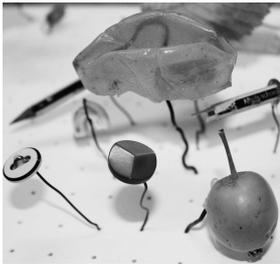
<p>CREATIVE TOOL No. 3, 'Life on Land': West Dean. Workshop two Date: 14.07.2017 Participants: twelve children (aged 10-11yrs), one governor, two teachers, and me</p>	<p>QUESTIONNAIRES</p>  <p>pre and post-workshop</p>	<p>INTERVIEWS</p>  <p>talking pegs</p>	<p>VIDEOS AND PHOTOS</p>  <p>assemblages</p>
<p>AGENCY Developing participatory skills and learning how to get the best out of a group helps to nurture self-efficacy and self-regulation</p>	<p>Pre to post-workshop self-evaluations scores included: How effective are you in a team? Scored +4 How often do you reflect on your work? Scored +7</p>	<p>During the workshop, the children took ownership of the agenda and began to revise the timetable to accommodate a session of surreal storytelling. Ben: "...we can do this!" The 'design studio' fostered self-efficacy.</p>	 <p>participatory skills</p>
<p>METACOGNITION Children think about thinking and make new drawings, models based on stories, new declarative and new procedural knowledge</p>	<p>How often do you try to improve your work? Scored +5 How confident are you about drawing ideas? Scored +7</p>	<p>Kate: ...we could actually see the story coming to life on the board in front of us... 'Talking Pegs' allowed children to "...try something new and fun" and "...the puppets made things real "...in a strange way"</p>	 <p>thinking and making</p>
<p>EMPATHY The focus is on exploring what links us to other people and the nature and equality of relationships by 'waking in the shoes of another'.</p>	<p>How often do you help others? Scored +3 How effective are you at explaining things? +3 Kai said he found storytelling difficult but was inspired by the assemblage approach within his quartet</p>	<p>Kai: ...can you imagine seeing the first ever strawberry?" Teachers Kuong Hee and Tae Yeon felt thinking through making brought about a change in perception in children when co-designing assemblages.</p>	 <p>links to other people</p>
<p>WAYS OF BEING Changing a mental state and position requires a macro account and reason to think and act differently.</p>	<p>How good are you at storytelling? Scored +3 and gave children self-belief in their capacity to create stories through 3D assemblages. Kuong Hee and Tae Yeon felt the workshops could be 'translocated' to their schools in South Korea.</p>	<p>Kai: "When we collected stuff from the garden I did not understand why – but when we made the storyboard it made me think differently."</p>	 <p>thinking 'sideways'</p>
<p>REFERENCES</p>	<p>Chapter 4 (pp. 161-162) Chapter 4 (p.170)</p>	<p>Chapter 4 (pp. 170-171)</p>	<p>Videos 8 and 9</p>

Figure 4.48: Blueprint Exchange learning tool no. 3: 'Life on Land'

5.0 Findings and conclusions

Primary school participants provided extensive data related to the themes of the study through a series of creative workshops. The interpretivist nature of the analysis reflects the thoughts of children, teachers, members of learning circles, me as researcher, and other practitioners who took part. Areas of potential new knowledge are aimed at developing teacher engagement with signature pedagogies in art, design and making. The longer-term aim is to impact upon curriculum policy and the development of transition design schools.

Findings and conclusions include:

5.1 ‘Theatre of the Imagination’ builds upon previous research

I have been involved in award-winning art and design collaborations between higher education institutes and primary schools in the UK, India and Mexico over the past twenty years (**Appendix 1, p. 189**). Building on ‘Escuela de Artes’ and ‘Colours of India’, ‘Theatre of the Imagination’ has collected and disseminated findings to a wider audience of school teachers to demonstrate the value of creative practice in primary education. By adapting the Winterhouse Matrix as a ‘road map’ for incremental change, the workshops grew in scale and in geographic spread (**Figure 2.5, p.59 and 2.6, p.60**).

5.2 The Winterhouse Matrix supports transition design in schools

The workshops adapted Gagnon and Collay’s CLD model to help transfer signature pedagogies from art and design into primary schools and to nurture agency and metacognition. The model helped to encourage strategic thinking in children, teachers and in me through participatory action research (**Figure 3.2, p.72**). By placing the constructivist workshops in the context of the Winterhouse Matrix, action at a small scale drove the development of whole-class lessons at Halstow and translocated practice in Mumbai. Action research aimed at curriculum change was fostered through co-design across continents.

5.3 Creative toolkits can be applied independently of the researcher

Participants, teachers and practitioners helped me to empirically test prototypes of the learning toolkits in primary schools in London, West Dean, Plymouth and Mumbai. Children, teachers, fellow researchers and members of learning circles from Halstow Primary School

in London and IITB in Mumbai generated effective examples of the learning toolkit being deployed independently of me (**Appendices, two, 194, three, p.214 and four, p. 217**). The toolkit was expanded in new ways through the agency of teachers and children at these schools (**Video 13**).

5.4 Creative workshops nurture personal agency in children

The workshops produced qualitative evidence illustrating how participants applied creative practice to improve self-efficacy and self-regulation. Evidence collected in the form of self-evaluations, video recordings, dialogic exchanges and artefacts indicates that co-designing encourages the effective development of visual communication skills, and visual narrative exchanges between children and between children and adults (**pp. 164-172 and 174-178**). Working in ‘the studio’ in duets and quartets encourages dissonant opinions to flourish and to be heard. Working in design teams with a common global goal encouraged empathy towards partners locally and globally (**Figures 4.20, p. 132; 4.28, p. 139 4.32, p. 142**).

5.5 Creative workshops foster metacognitive skills

Evidence suggests that exploring the global goals through designing helps to build declarative knowledge and scaffolds procedural knowledge. Participatory design helped to make meaning out of co-operative experiences and provoked innovative thinking as illustrated in the videos. Evidence of metacognitive skills fostered through design and making emerged from each creative workshop as noted in interviews with children (**pp.164-172**) and by teachers and learning circles. Thinking, reflecting and thinking again through design and making became a common strategy employed by children (**Figures 4.33, p. 143; 4.40, p. 160; 4.41, p.160**).

5.6 The UN global goals help foster empathy

Values emerged and appeared to ‘stick’ in the studio environment. Qualitative evidence generated during the workshops indicated that children enact tacit knowledge when designing and making. ‘Theatre of the Imagination’ workshops provide compelling examples of how the UN global goals nurture an axiological perspective in children. Evidence emerged through informal discussions, self-evaluations and ‘Talking Pegs’ videos. Further evidence emerged from the design of magical sea creatures in ‘Life Below Water’ and from the

development of automata in 'Make Your Move'. 'Theatre of the Imagination' generated a myriad of examples indicating the ability and desire of primary school children to think by 'putting on different shoes' (Figures 4.32, p. 142; and 4.41, p. 160; Video 3).

5.7 'Theatre of the Imagination' contests EEF research

Design and making workshops synthesise metacognition, self-evaluation, peer tutoring and co-designing. These findings contest EEF research suggesting that the arts have a low impact on additional learning. 'Theatre of the Imagination' also illustrates how design and making can be accommodated in mainstream primary education today. If teachers were to adopt this approach it would remain congruous with government policy focus on literacy and numeracy. I intend to continue gathering evidence to encourage policy review, curriculum development, and professional development through design and making in mainstream primary education (Figures 2.2, 2.3 and 3.2).

5.8 Drawing and making help reflexivity and professional research

Thinking through drawing and the co-production of 'mosaic tiles', as a method of data organisation and analysis, may help practitioners to explore theory by making new connections (pp. 174-178). Contributing additional evidence in support of drawing as an effective tool in practice-led research may help teachers engage in professional development that can be immediately applied in class lessons. Evidence supporting the professional development of teachers through drawing was generated at Halstow School and at West Dean School and has been captured in videos and self-evaluations made by children taking part in the workshops (Videos 3 and 9).

5.9 Art and design helps foster a 'third culture' in primary schools

'Theatre of the Imagination' adds to the existing body of creative learning methods designed to explore the UN global goals. The creative toolkit brings together numeracy, literacy, science and global citizenship to help foster directed independent learning. Evidence supporting design and making as a method of synthesising the sciences and humanities for the purpose of innovation emerged from many workshops including 'Make Your Move', 'Life below Water' and 'Life on Land' (Videos 7 and 8).

5.10 Further salient points

The idea of embracing chaos and uncertainty is ‘the everyday’ for design researchers and practitioners and my experience in higher education helped balance ‘symmetrical reciprocity’ between facilitators and the children as activities played out (**Video 9**). The CLD structure allowed ‘creative turns’ and unexpected opportunities to take hold during the workshops in response to the ideas and preferences of participants, and in response to unforeseen late changes in school timetables. Navigating through these changes stretched me but the support of colleagues and children resolved most short-term difficulties.

Working as a design studio and encouraging open-ended creative thinking in mainstream primary education can be messy, uncertain and challenging. But primary children are able to develop agentic and metacognitive skills through design and making and, during this process, to reflect upon their axiological stance in relationship to the global goals. The adaptation of the ‘Winterhouse Matrix for Social Innovation’ (**pp. 59-60**) provided a framework to map incremental steps towards curriculum development and, potentially, policy development in mainstream primary education. Ideas generated and tested included working with international colleagues as a first step towards a network for transition design and making in primary education, as proposed in the Winterhouse Matrix (**Video 13**).

Outcomes offer deeper insights when the workshops are reviewed in series. ‘Theatre of the Imagination’ gains salience when teachers translate small-group workshops into whole-class lessons, as was the case at Halstow Primary School and IITB (**Appendices two, p. 194, three, p. 214 and four, p. 217**). The research team at IITB developed creative workshops in response to the ‘Theatre of the Imagination’ toolkit, independently of me. The potential for incremental development of ‘Blueprint Exchange’ as a method for nurturing a network for creative practice in primary schools is given greater momentum through this initiative.

Learning circles and teachers across a nascent network of schools helped to summarise their opinions related to the general impact of ‘Theatre of the Imagination’ workshops on primary participants (**Chapter 4, pp. 96-174**). Stakeholder groups at each school found evidence that design and making workshops fostered agency and metacognition through studying UN global goals. Gaining declarative knowledge enabled children to co-design models and videos and to express their engagement in social and environmental issues. The second

workshop at PSCA found the researcher working as a sole facilitator with six lower KS2 participants, which demanded ‘having to let go a little’. Participants demonstrated high levels of agency ([Video 12](#)) indicating that the synergy generated in a ‘design studio’ can be compelling when children are trusted with a degree of autonomy. Reassuring children of their ability to express imaginative ideas as personal, embodied knowledge through the models they design and make helps to foster a creative climate in which caring for partners and learning through making became commonplace.

Embodied knowledge applied through designing and making was made explicit through drawings and models that linked declarative knowledge about the global goals to procedural knowledge including planning, testing, revising, evaluating and reflecting. Developing the ability to think about one’s own thinking helped children to act and learn independently. For example, Matteo felt that visualising his thinking helped people to see, hear and touch his story and therefore never forget ([Figure 5.1](#)).

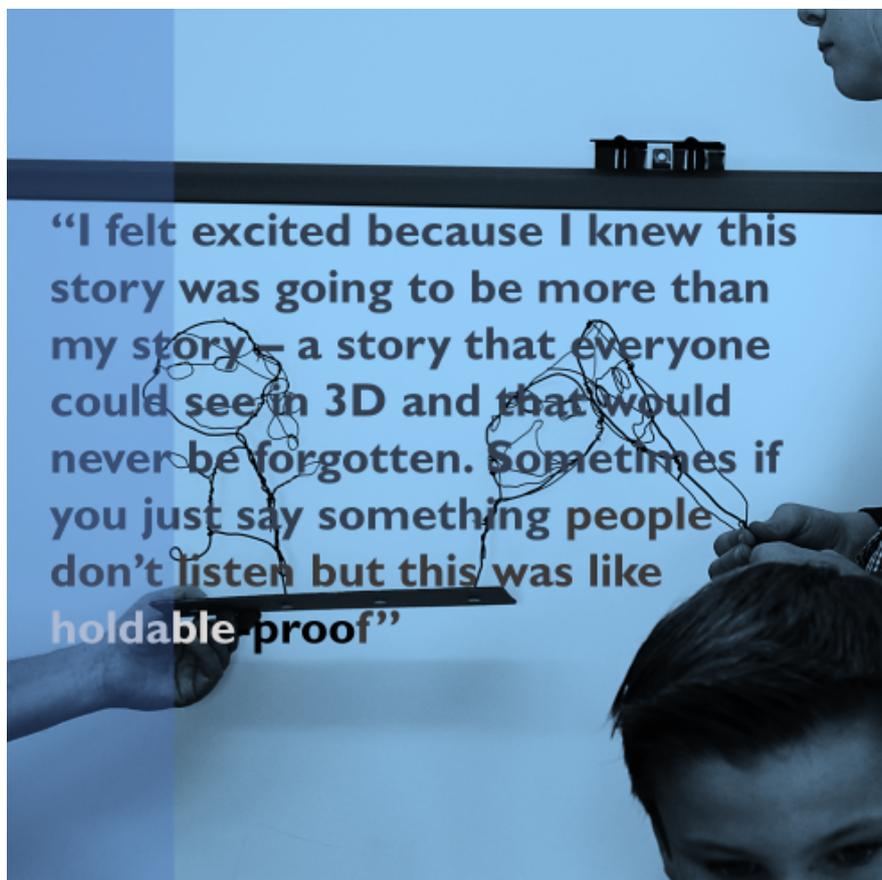


Figure 5.1: Matteo on drawing and making (2016)

The probes created by students at West Dean and sent to the Indian Institute of Technology provided a platform for participants in India to select and investigate local problems related to water (**Video 13**). On watching the video made at IITB, Erin said, 'I thought water shortage was a big problem, but the monsoon is also a disaster'. Teachers at the schools involved felt that the potential for developing empathy and compassion across geographic space through an open-source website was high (**Figure 5.2**).



Figure 5.2: Stories exchanged between India and the UK (**Video 13**)

Working with partners and in teams tested the children's ability to manage cognitive dissonance. Students pooled knowledge and helped scaffold learning by working with partners. Sharing embedded knowledge helped to foster confidence and teamworking as students built upon stories from their personal lives: 'My mother always knows exactly what to say when I am feeling sad' (**Appendix 2, p. 194**). Developing thinking related to the global learning goals and making artefacts and videos may help to heal the negative divide between teaching knowledge and teaching skills in primary education.

All members of the learning circles who participated in studio workshops cited examples of participants supporting and helping their partners and other members of the group. Participants exhibited empathy, listened to peers and discussed ways in which they could improve the outcomes as a team (**Chapter 4, p. 164-173; and Video 11**). Supporting the **professional development of mainstream primary school teachers**, along with the introduction of a creative toolkit, may require a small amount of additional funding at a time of diminishing budgets. But there are no significant implementation costs.

6.0 Recommendations

I recommend that ‘Theatre of the Imagination’ workshops continue to engage policymakers and senior educators in the primary sector to demonstrate the potential of design thinking and making in mainstream education across geographic space. ‘Theatre of the Imagination’ builds a case for exploring pressing environmental and social issues through design and making. Encouraging children to take a playful approach to serious issues helps foster agency and metacognition in primary schools.

The following recommendations represent ideas that emerged through practice and good discussion with teachers and participants who took part in the workshops:

- **Fostering links with primary schools in other countries helps foster greater awareness of diversity and increased empathy across geographic space.** Continue to pilot workshops, across continents, to foster empathy and compassion in primary children through design and making. Valuing diversity and nurturing ‘care-full’ stewardship of the planet and its people, at a time of political fragmentation, is a critical issue for the next generation.
- **Artefacts produced by primary children in ‘Theatre of the Imagination’ workshops exemplify agentic and metacognitive thinking at work.** Participants used model-making to analyse a situation and to plan a course of action. Haptic skills are required by engineers, surgeons, farmers, parents, architects, cooks, archaeologists and builders. Ways of thinking through making will need to be taken seriously to address the dramatic loss in making skills, not just in schools but in society. This issue could be addressed through wider engagement with ‘Theatre of the Imagination’.
- **The workshops applied a portfolio of learning tools which gave students and teachers greater confidence to use design thinking and making in the classroom.** Restrictive assessment schemas, such as those promoted by PISA, do not promote creativity and they do not allow sufficient time for collaboration through art and design. Creative workshops tested tools that addressed this issue in an incremental way. Developing design as a ‘third culture’ would act as a fillip to teachers and students who wish to express ideas forged through exploring global learning goals.

- **Creative practice as a ‘third culture’ may help to reassure current policymakers that the emphasis on metrics-based testing and assessment is not overlooked.** Testing is not the only, or even the most effective, way to develop cognitive and non-cognitive skills and the cultural knowledge children need to engage in creative enterprise. The potential impact of design and making on agency, metacognition and cognitive acceleration requires further research as a matter of urgency.
- **Nurturing learning beyond the ‘three Rs’ may help to retain and attract good teachers to mainstream primary education.** Adding a creative toolkit to a growing body of work undertaken by the Royal Society of Arts, aimed at broadening and enriching the primary curriculum while driving additional and independent learning, may help to engage more teachers in design and more designers in teaching. During uncertain times, a steady stream of qualified graduates and school leavers is a strong investment for the future. Encouraging more design graduates into primary school teaching may help to develop the creative curriculum.
- **Continue to investigate the impact of ‘Theatre of the Imagination’ workshops on ‘twice exceptional’ primary students.** Learning tools developed through the workshops have the potential to make a contribution to SEN. Gifted children with Asperger’s syndrome, for example, have yet to be investigated empirically. Children assessed as average by their class teacher in ‘Theatre of the Imagination’ or judged not performing at the average level for their age often displayed advanced creative ability, and some students judged to have a higher level of mastery in numeracy and literacy were sometimes more tentative and less confident when generating imaginative ideas through making and abductive reasoning. A different approach to SEN becomes more pressing at a time when resources in mainstream primary education are very scarce.
- **Introduce professional development workshops in mainstream primary education, using the ‘Theatre of the Imagination’ creative toolkit.** This may help to address the paucity of training in ‘signature art and design pedagogies’ in teacher training and may also have a significant impact on motivation. Many experienced commentators believe that the primary curriculum is not fit for purpose and that children are not

being taught to develop personal agency at a time when ‘smart technologies’ have impacted on the development of haptic skills and peer-to-peer co-operation in primary education. The creative toolkit is aimed at developing a constructive balance between haptic and digital skills.

6.1 Final word from Isabel

Year 6 class teacher, Isabel, explained how the pilot workshop had a beneficial impact upon Halstow Primary School:

‘Make Your Move’ generated enthusiasm among teachers and children. As a result, the global goals have informed much of our learning and will, in fact, be the theme for this year’s Arts Festival. The Global Goals can come across as too ‘big’ for children – and for us - to comprehend. ‘Make Your Move’ focussed on personal experiences of compassion which meant that children could see how the ethos and values underlying the global goals really do apply to their daily lives, decisions and actions.

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Appendix one: History and motivation

A1.0 Motivation of the author

The under-recruitment of teachers, combined with government intervention in the primary curriculum content, raises concerns about what children will inherit from a creative and sociotechnical perspective. Education, from primary to tertiary, has arrived at a tipping point (National Association of Head Teachers, 2017) and research is needed to help navigate a way forward at a time of uncertainty.

In an article for Co-design (1995, p.11), Archer wrote about a growing recognition of arts practice as research when there are circumstances where, “...the best or only way to shed light on a proposition, a principle, a material, a process or a function is to attempt to construct something, or to enact something, calculated to explore, embody or test it... “. Archer reflects my way of working, influenced by a connected series of milestone events and experiences, over more than four decades.

A1.1 Henry Morris and Walter Gropius

The work of Morris and Gropius in Cambridge provided early inspiration related to how architecture and design can be a driver of social innovation. In 1934, Gropius collaborated with Morris on the design of Impington Village College (**Figure A1.1**). The Village College was to act as ‘a silent teacher’ offering inspiring spaces for local communities to learn and socialise. Feilden Clegg Bradley Studios design for Plymouth School of the Creative Arts (2015) continues this tradition of community schools.



Figure A1.1: Drawing by Walter Gropius for Impington Village College (1936) and Feilden Clegg Bradley Studios design for Plymouth School of the Creative Arts (2015)

A1.2 Victor Papanek and Fulbourn Psychiatric Hospital

Papanek (1971, preface: para 1) suggested that “...there are professions more harmful than industrial design, but only a very few of them.” When Professors Frank Height and Christopher Cornford organised the landmark symposium ‘Design for Need’ at the RCA in 1976, they invited Victor Papanek to be their key speaker. The symposium exhibition was conceived to reflect Sir Misha Black’s thinking on design with a social purpose. Work by several foundation students at Cambridge Art School was submitted to the exhibition including a series of sculptures and murals made for Fulbourn Psychiatric Hospital in Cambridge. As a participant in the exhibition, and an assistant art therapist at the hospital, I received an invitation to Papanek’s lecture which marked the beginning of my engagement in design for social innovation and in the work of the Royal College of Art.

Developing a pedagogic toolkit for design thinking and making in primary education reflects Papanek’s rejection of “...design for pampering the already over-provided” and looks at how educators can foster learning through making in mainstream primary education (**Figure A1.2**).



Figure A1.2: The Victor J. Papanek Foundation©, University of Applied Arts, Vienna, advances the understanding of design from the perspective of social responsibility (2017).

A1.3 Design for society, the economy and the environment

My masters research project, as a student the RCA from 1978-81, was to investigate how to maintain a craft aesthetic through to the mass production of furniture (**Figure A1.3**). This commitment to making design accessible influenced a seating system, utilising computer numerically controlled manufacture, which explored ‘the triple bottom line’ (Elkington, 1997) of social, economic and environmental factors.

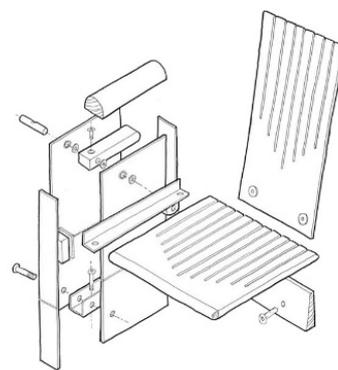
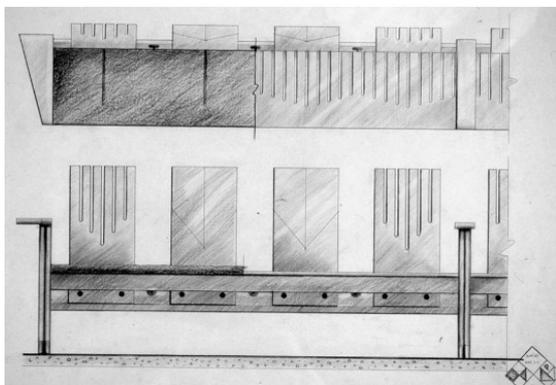
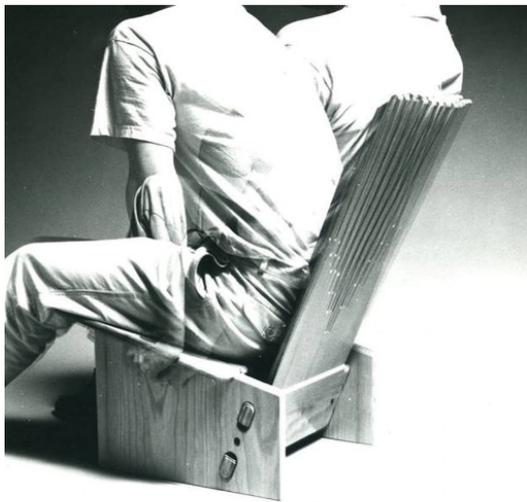


Figure A1.3: The 'Flexichair' seating system (Pulley©, 1980). The system was specified by Koski Solomon Architects as auditorium seating for the Liberal Jewish Synagogue in St John's Wood in 1990.

In the Kyoto Design Declaration (2008), the International Association of Universities and Colleges of Art, Design and Media declared that their aim would be:

...to contribute to sustainable social, environmental, cultural and economic development for current and future generations, the Cumulus members will commit themselves to accepting their part in the further education of our youth within a value system where each of us recognises our global responsibility to build sustainable, human-centred, creative societies.

A1.4 CADE and ICSID

My interest in responsible social and environmental stewardship helped the development of a portfolio of degree programmes at Falmouth College of Arts, including ICE: Innovation, Community and Environment (1994). Falmouth was selected by Professor Shirley Ali Kahn for HE21, an initiative dedicated to developing sustainable environmental systems in universities. A research initiative was devised to bring students and academics together, across all subject areas, to work with local and global primary schools. I presented the concept of the 'Solar Eclipse Project' at the Computing in Art and Design Education (CADE) conference at the University of Derby, in 1997, and this paper was subsequently selected by the organisers ICSID 1997, Toronto. Falmouth was consequently invited to host the first CADE student research conference in 1997.

The 'Humane Village' symposium (1997) attracted collaborators from art and design in HEIs located on the straight-line trajectory of the 1999 total eclipse. The concept was to daisy-chain creative events between primary schools and universities, related to the eclipse through 'carnival', a theme proposed by Charles and Ray Eames in their seminal 'India Report' (1958). Dr Ajanta Sen and Professor Ravi Poovaiah, researchers from the Indian Institute of Technology in Mumbai (IITB), collaborated with me on this early example of computer-mediated communication. 'The Colours of India' (Sen et al., 2009) connected IITB to Falmouth College of Arts through a programme of cultural exchange which, noted by Ofsted, addressed a lack of cultural diversity in Cornish primary schools.

Ajanta Sen (2002: p.5-6) described the project as ground-breaking:

...here was a priceless opportunity to use a moment in history when a complete solar eclipse was on its way to eclipsing the largest swathe of landmass in recorded human civilisation. To make a strong figurative statement about 'connecting up' cultures and institutions...

An essential characteristic of this creative climate was the multi-sensory nature of 'events' which were colourful and exciting for children and adults alike. Experiences unfolded like a stop-frame animation. The Project started during the last decade of the closing century. Some suggest that when history is written this time will be referred to as the new gold rush. But what if you were, instead, the indigenous child who had the advantage of witnessing something unfold before your eyes? You may then refer to the same decade as one that

nurtured the nexus between technology, science and art - that demonstrated how the digital stream allowed imaginations to flow as one.

The 'Colours of India' website was granted official NASA designation for the Total Eclipse in 1999 and nurtured an abiding commitment, by the researcher, to work on participatory projects across continents, and across higher and primary education (**Figures A1.4 and A1.5**). The IIT connection was rekindled in recent months to test the effectiveness of translocating' a 'Theatre of the Imagination' workshop (**Appendix three**).



Figure A1.4: 'The Solar Project' – an Indo-British initiative designed to celebrate the 1999 Solar Eclipse (IITB©).
In the process of creating new art, new friendships were forged.



Figure A1.5: Colours of India – 'Elephant in the Corner', Falmouth College of Arts (1999)

'The Colours of India' creative exchange across primary and higher education provided a Blueprint for a creative exchange between West Dean College in Sussex and Las Posas in Mexico. These

exquisite, contrasting landscapes have a historical connection forged by the surrealist Edward James and this proved valuable for postgraduate students and artists in both locations.

A1.5 Escuela de Artes and the West Dean Festival

The theme of 'The West Dean Festival of Making' in 2012 (**Figure A1.6**) was creative collaborations across generations. The event was planned and organised, over the course of six months, by a multidisciplinary team at West Dean College. The writing, music and making festival evolved from a 'Guardian Classroom Innovation Award' project. Escuela de Artes (Dobson, Linan, and Pulley, 2011) developed as a collaborative arts project with West Dean School and two primary schools in Mexico.



Figure A1.6: Sketches for Tall-Stories (Pulley, 2011) and the West Dean Festival Gates (Richard Barnes, 2012)

The Festival included printmaking, ceramics, sculptures, tree house building, and kinetic toy making, undertaken by children with the help of students and tutors (**Figure A1.7**). The festival was also the subject of a series of hand-made books recounting the personal stories of new friends on another continent. Engaging autobiographical accounts, complemented by performances, artworks and videos, provided an example of what Manzini describes as 'cosmopolitan localism' (2017), and this concept informs the ethos of 'Theatre of the Imagination' and the position of the researcher (**Appendix five**).



Figure A1.7: Edward James in Las Pozas (The Xilitla Foundation©, 1965) and the Escuela de Artes residence programme (Photo: Emma Dexter©; Tree House: Jonny Martin©, 2009)

Andy Dobson, Upper Key Stage 2 teacher at West Dean Primary School explained:

We are a small village school (*and*)...have had to think creatively about how we use ICT to enrich our curriculum and give our pupils a wider experience of the world. Armed with some laptops, a digital camera, a blank Moodle, and the support of West Dean College, we have begun to make links with schools in the Mexican jungle to share our connection with the poet and patron of the arts, Edward James. Pupils set up a collaborative website to share work they had produced. They used forums to ask questions and updated and uploaded materials and resources. Year 5 and 6 pupils even ran training sessions for our staff...

The project created opportunities for primary students, teachers and artists to develop a better understanding of life on another continent and how exchanging creative ideas across geographic space provides cultural value and encourages reflection on identity, diversity and place (Ingold, 2013). The idea of sharing ideas across a campus and across geographic distance informed the development of Theatre of the Imagination at the University of the Creative Arts, based at Farnham.

A1.6 Theatre of the Imagination at UCA

Connecting people at a distance, through art and design, was a theme nurtured at The University for the Creative Arts and the first iteration of 'Theatre of the Imagination' took place at the Farnham campus (Hylton and Pulley, 2014). Undergraduate and postgraduate students, artists in residence, researchers, academics and administrators worked together in the Hockey Gallery, where things made did not automatically become locked into a final form, as they flowed backwards and forwards, over the period of a week, in the manner of 'Exquisite Corpse' (Breton, 1925).

The intention was to encourage students and staff at the four UCA campuses in Farnham, Epsom, Rochester and Canterbury to engage in a flow of ideas, information, people and things across Surrey and Kent. These communities enjoy the unusual status, and concerns, of being part of a federation of art colleges (**Figure A1.8**).

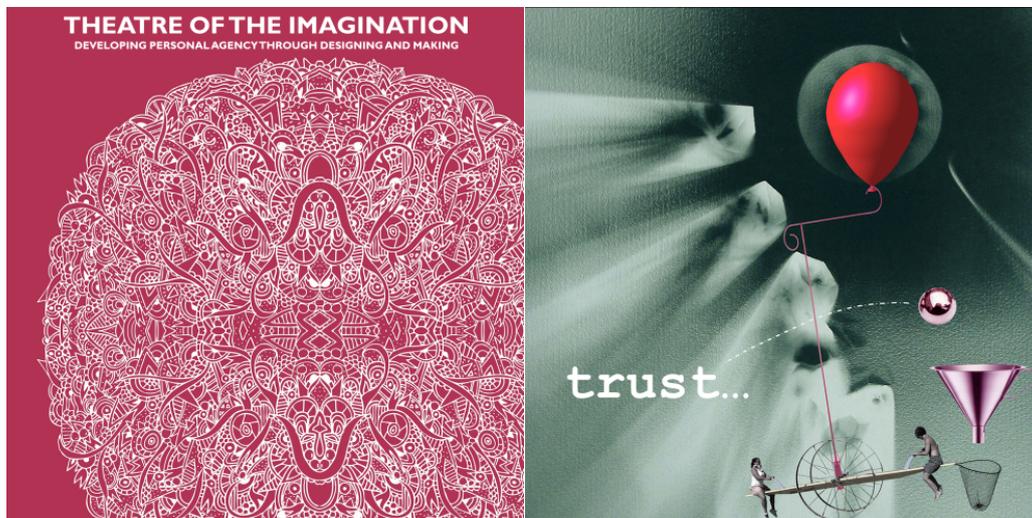


Figure A1.8: Poster by Abigail Fuller©, Graphic Design Student, UCA (2014). Bricolage objects made from found materials (Pulley, 2014).

The outcome of ‘Theatre of the Imagination’ at UCA Farnham was a proposal to develop a research centre for design and making funded by the local council and UCA in which design research students would develop collaborative projects for diverse communities to help integrate local people with migrant families through design, making and enterprise. The proposal was to repurpose two abandoned chapels, owned by the local council, and to foster aspects of creative practice, across generations, and across indigenous and migrant communities.

A1.7 Does Design Care...?

Professors Paul Rogers and Craig Bremner organised a co-design workshop to develop ‘The Lancaster Care Charter’ in September 2017 (**Appendix six**). More than twenty papers were presented, including a jointly-authored graphic short-story by Moradi and Pulley (**Figure A1.9**). Delegates co-constructed the Charter, in response to the vital question “Does Design Care...?” and via a series of conversations that explored a range of provocations for the contemporary context and complex challenges for ‘Care’. The Lancaster Charter (2018) included input by delegates from five continents who shared ideas about the way design can help address issues related to the displacement and movement of people, a growing demographic issue of our time.

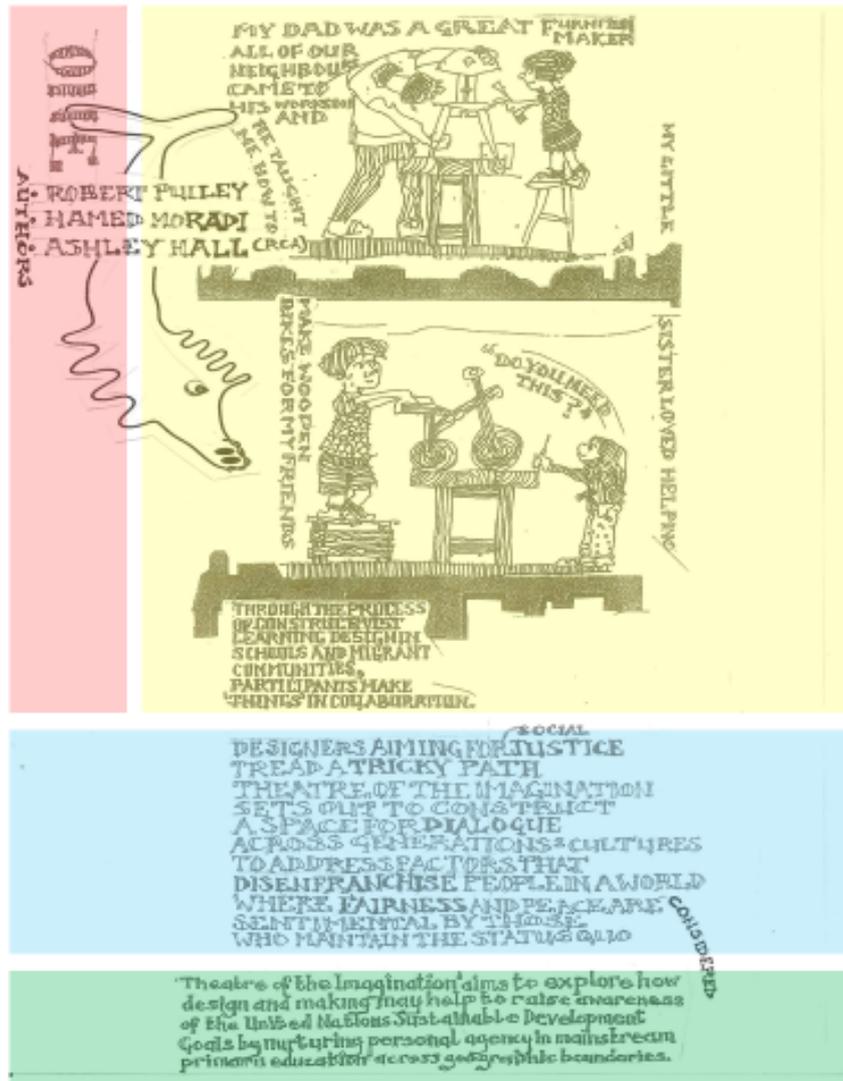


Figure A1.9: “My dad was a great furniture-maker...” (Moradi and Pulley, 2017)

Motivation and approach for the research project:

In an article for Co-design (1995), Archer wrote about a growing recognition of arts practice as research:

There are circumstances where the best or only way to shed light on a proposition, a principle, a material, a process or a function is to attempt to construct something, or to enact something, calculated to explore, embody or test it (p.11) .

‘Theatre of the Imagination’ as a rich tapestry

The series of experiences and projects are connected by a common ethos which combines a commitment to thinking and to making in a cooperative studio environment. Signature pedagogies in art and design have the potential to foster dialogic exchange, encourage self-regulation, build self-

efficacy and nurture cognitive acceleration across generations and across geographic space. Building social and cultural capital and the capacity of students to become independent learners are prerequisites for a society founded on giving and returning as a reciprocal gesture of care.

A network of common threads, woven over a period of forty years, helped me to create a series of co-designed projects with a myriad of people from different disciplines. Manzini (2015) describes 'Social Innovation' as a bottom-up driver to help create a more sustainable society. Thackara (2015), an advocate of Manzini and his ideas, describes 'Social Innovation' as the creative force for emerging, connected microworlds in which human and environmental interests converge. In this world, collaboration counts for more than consumption, and relationships are the source of value.

Manzini explains that 'diffuse' design is performed by everybody and 'expert design' is performed by those who have been trained as designers. He does this to help map out how design experts can foster meaningful social changes, focusing on emerging forms of collaboration, to make change more probable and more effective in the coming decades. Social Innovation, according to Manzini, is founded upon values and meanings which reflect those made explicit through the United Nations Global Goals for Sustainable Development: social justice, the eradication of poverty, and responsible stewardship of the planet across geographic space and time. The ethical threads that connect 'Theatre of the Imagination' and 'Social Innovation' also connect 'Transition Design'. Irwin et al. (2015) explain their position:

Fundamental change at every level of our society is needed to address the issues confronting us in the 21st century. Climate change, loss of biodiversity, depletion of natural resources and the widening gap between rich and poor are just a few of the 'wicked problems' that require new approaches to problem solving.

And Neal (2015), suggests the time has arrived to begin again with stories that connect to new ways of being human on Earth. She believes the current story is tired and spent and it is artists and communities who will bring stories to light about living creatively within the limits of a finite planet. Taking responsibility for the stewardship of our planet is, according to Bremner and Rodgers (2013), fundamental to the pressing question of our time: "How do we make the world a better place?" The drive to integrate humanities and science through designing and making provides fertile ground for 'Theatre of the Imagination' as a holistic approach to fostering a 'third culture' (Cross, 1979). A 'third culture' which may help provide the flux that brings together the arts and sciences in our endeavour to build a more compassionate and humane future for the next generation.

Appendix two: Halstow Primary School workshops

Halstow is a mainstream primary school with approximately 400 pupils, located in the Royal Borough of Greenwich in London (**Figure A2.1**). Physical Education and the Arts permeate the curriculum and the school orchestra and choirs perform regularly to a wide range of audiences. The quality of its arts provision is recognised by an Arts Mark Gold award. The quality of education at Halstow is judged to be outstanding by OFSTED and the teaching staff draw on current research to stretch and challenge children.

The school is committed to ensuring children have the levels of literacy and numeracy to equip them with the skills for a productive secondary education. High self-esteem, confidence and motivation also characterise learning and preparation for a fulfilling life. Halstow is a Teaching School, and staff work closely with partners to develop the quality of teaching across the borough. The School orchestrates teacher training for student teachers in partnership with Goldsmiths College, University of London. I approached Halstow because my daughter is the arts co-ordinator and because of the creative approach and commitment to the arts of the school's headteacher.



Figure A2.1: Halstow Primary School raising money for Children in Need (2017)

Make Your Move: workshop one

The first 'Theatre of the Imagination' workshop was designed to develop a Learning Circle which included an experienced Upper Key Stage 2 primary school teacher, two newly-qualified teachers, an architect, a designer-maker, a foundation art and design student, a student of sociology and me. The group developed a Participatory Action Research approach (Bradbury, 2001) aimed at planning and testing a Constructivist Learning Design process (Gagnon and Collay, 2006) and establishing what resources would be needed to run a pilot workshop with KS2 students at Halstow Primary School. The group built and shared knowledge through drawing, dialogue, making and reflecting with a focus on testing the aims of 'Theatre for the Imagination'. A concept map, aligning the aims of the research to a self-evaluation questionnaire for students, was one of the outcomes of the first learning circle meeting (**Figure A2.2**).

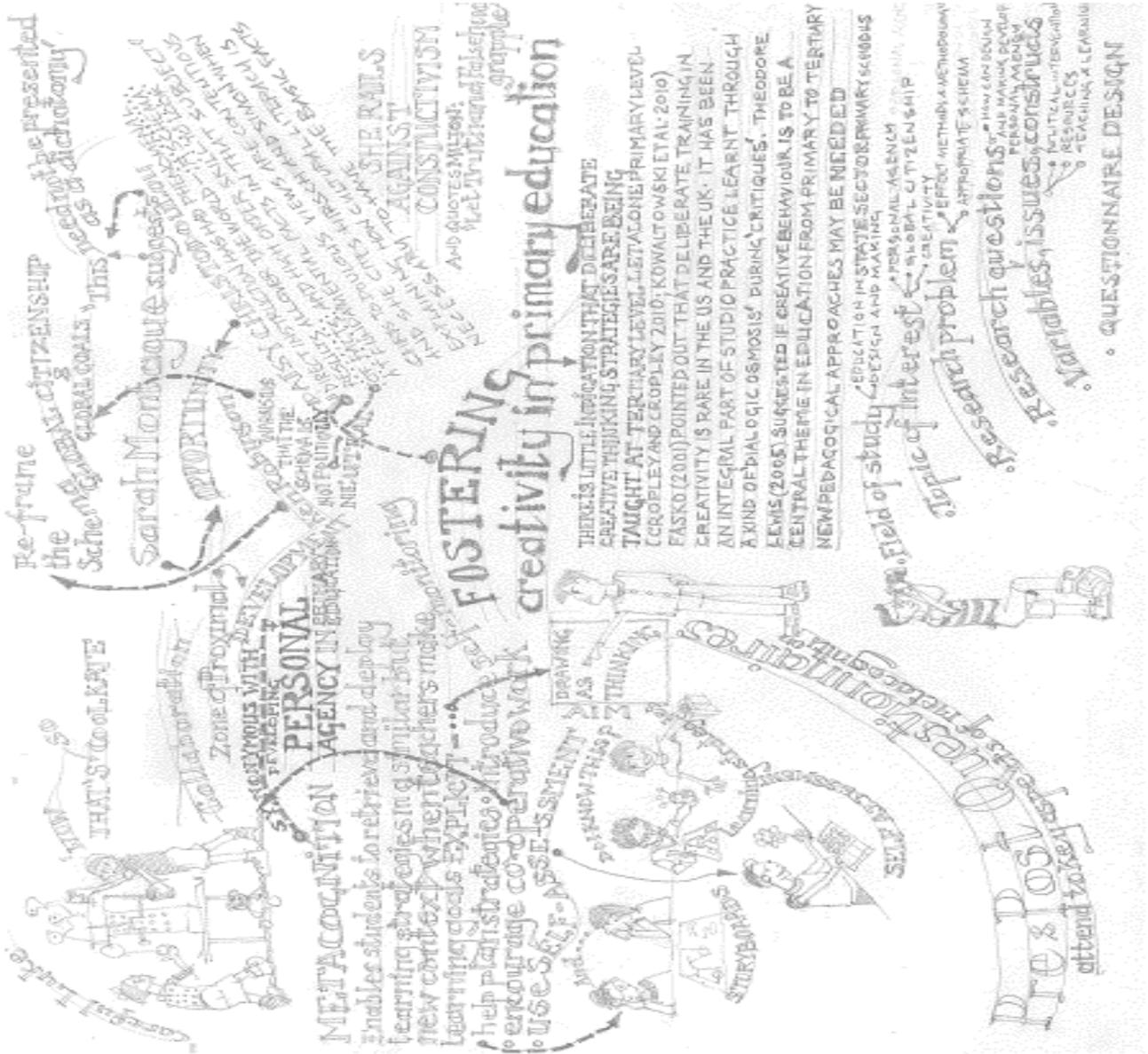


Figure A2.2: The concept map for the design of the self-evaluation questionnaire for KS2 students (2015)

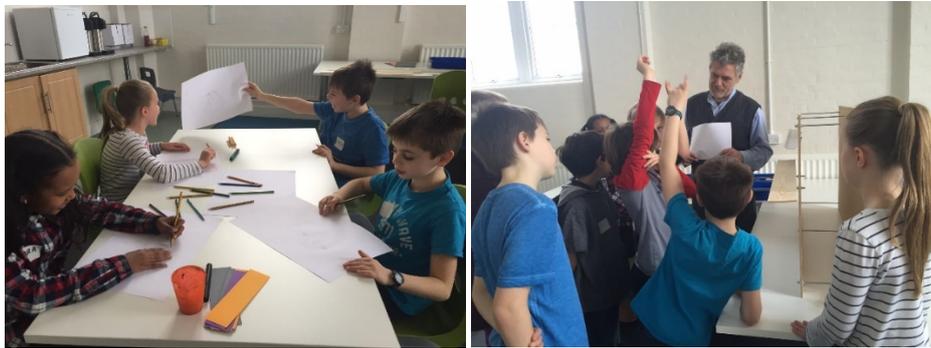


Figure A2.3: Gravity machines with UKS2 at Halstow School (February 2016)

MAKE YOUR MOVE: workshop one - learning circle	interviews and self-evaluation questionnaire	discussion between participants	learning circle critique	drawings and artefacts
applying creative practice to foster agency	N/A	MEDIUM storyboarding helped critique and fostered creative culture	MEDIUM shared personal stories through drawing and co-designing	HIGH immediate engagement with storyboarding and prototyping
developing metacognition and design thinking	N/A	MEDIUM established definitions and fostered understanding	MEDIUM informed approach to self-evaluation questionnaire	HIGH immediate grasp of how design and making nurtures 'thinking about thinking'
raising awareness of global goals	N/A	HIGH reviewed selected global goals	MEDIUM propositional at this early stage	HIGH focussed upon personal stories in everyday life
considering how design could affect behaviour change	N/A	MEDIUM propositional at this early stage	MEDIUM discussion around global goals as a framework for philosophical positioning	HIGH visualising implicit and tacit thinking

Figure A2.4: Impact analysis related to first learning circle meeting 2015)

Make your Move: workshop two

Applying concepts of sustainability to Project Centred Learning, set within a constructivist educational epistemology, the first 'Theatre of the Imagination' KS2 pilot workshop was held on 23rd and 24th May 2016 at Halstow Primary School in Greenwich. The aims of the workshop aligned with those of the research study: to foster agency through creative practice; to develop metacognition through design thinking; to raise awareness of the UN Global Goals for Sustainable Development; to consider how design may foster change. These aims embed four key features: cognitive conflict (the mind develops in response to stimulation); social construction (dialogue with others is essential); metacognition (reflecting on how questions may be approached in an effective way); and self-regulation (the ability to monitor and control our behaviour or thoughts in accordance with the demands of the situation).

Personal agency is the capability to originate and direct actions for given purposes. It is influenced by the level of self-belief in performing specific tasks, termed self-efficacy, as well as by actual skill.

Nurturing the interdependence between self-efficacy beliefs and the use of self-regulatory processes is key to academic agency and developmental transition. Students with a strong sense of efficacy for learning are more resilient and better able to resist adverse academic influences (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996).

Constructivist learning Design:

Gagnon and Collay (2006, p.3) note that “...most of us are familiar with learners who memorise well and can restate facts, but they still struggle to articulate the meaning because they do not understand the concept.” In recent years, instruction of facts has gained a primary position in mainstream primary education and Project Centred Learning has come under attack. This is due, in part, to the outcome of PISA league tables and the success of the school systems in China and Singapore. Grehan (2016, p.272) believes:

Due to the limitations in working memory children find it difficult to discover concepts first. It is essential they realise things for themselves, and have their lightbulb moment, but this is best brought about by a lesson that is heavily structured by a teacher, in which she builds up student knowledge and understanding through clear explanations, open questioning, and modelling. Only when they’ve understood a concept can they think critically about it, make use of it to solve problems and be creative with it...

‘Theatre of the Imagination’ sets out to teach concepts and skills through design thinking and practice. The theme for ‘Make Your Move’ was introduced by the researcher with reference to the United Nations Global Goals related to social equity and renewable energy.

(viii) Situation

The primary concern at the outset was to discuss the vision and purpose of ‘Make Your Move’ with participants. The initial themes of the project, renewable energy and social equity, were explored through creative practice and the pilot workshop set out to explore participants tacit understanding of empathy and compassion.

(ix) Groups

The pilot workshop included a year 6 teacher, a student-teacher, four KS2 children, the design researcher and other teachers who stopped by. The team worked collaboratively and individually in advance of the project’s introduction to the whole class.

(x) Bridge

Participants were introduced to methods of drawing, designing and making wire models to help visualise memories of events in their everyday life by making automata using simple cam mechanisms, ephemeral materials, and bricolage (**Figure A2.5**).

(xi) Task

Models were developed from drawings and storyboards resulting from the ‘to and fro’ of transforming drawings on paper into three-dimensional ‘sketches’.

(xii) Reflection

Participants completed a questionnaire before and after the pilot workshop and took part in critiques and ‘good discussions’ (Bradbury, 2001) immediately after the workshop and then again six months after the workshop with the class teacher.

(xiii) Exhibition

The drawings, automata, videos and stories from the pilot workshop and the whole class lesson featured in Halstow School’s Arts Week 2016 exhibition, open to parents and friends.

(xiv) Evaluation

Interpretation and reflection involved discussing the thoughts and work of participants with the class teachers and other members of the learning circle.



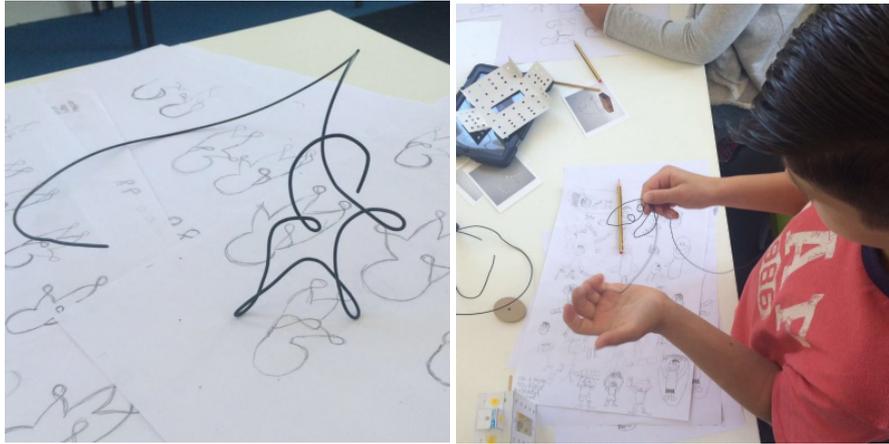


Figure A2.5: Participants designing and making automata (Photo by Charlotte Stirling©)

Insights

The approach to evaluation included: reflecting upon points arrived at through ‘good discussions’ with participants and members of the learning circle; analysing field notes; analysing participant questionnaires; and reflecting upon extracts from audio and video recordings.

To help evaluate the level of change, participants answered a series of questions related to self-efficacy and independent learning. Throughout the workshop children were asked: “Why are you doing things this way?” Participants were encouraged to think about how they work with others, what they can do to make change happen, and why this is important in helping to build a more sustainable future. The questionnaire reflects the concept map produced by the Learning Circle (**Figure A2.6**).

A review of student self-evaluation was set against the main aims of the project. Some of the questions related to more than one aim, such as, “How effective are you in a team?” Collaboration fosters self-regulation and can be used as a metacognitive strategy to encourage partners to think deeply about their thinking.

<ul style="list-style-type: none"> • How confident are you about drawing ideas? <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">UMMM</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">FAIRLY</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">QUITE</div> </div>	<ul style="list-style-type: none"> • How effective are you in a team? <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">UMMM</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">SO-SO</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">QUITE</div> </div>
<ul style="list-style-type: none"> • How much do you know about automata? <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">UMMM</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">A BIT</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">A GOOD BIT</div> </div>	<ul style="list-style-type: none"> • How effective are you at explaining things? <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">UMMM</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">OKAY</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">GOOD</div> </div>
<ul style="list-style-type: none"> • How would you rate your making skills? <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">UMMM</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">OKAY</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">GOOD</div> </div>	<ul style="list-style-type: none"> • How often do you help others? <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">UMMM</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">NOW AND THEN</div> <div style="border: 1px solid white; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">OFTEN</div> </div>

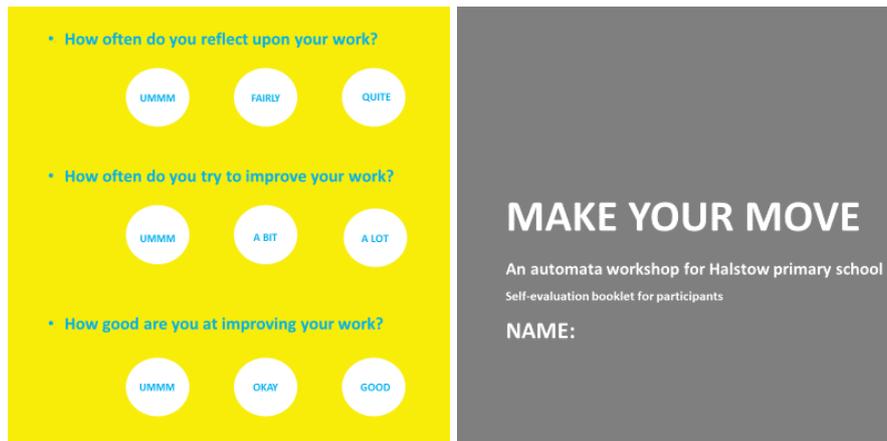


Figure A2.6: Questionnaire, designed to raise awareness of the aims of the project and to elicit feedback.

'MAKE YOUR MOVE': WORKSHOP TWO	PRE-TO-POST
how effective are you in a team?	+10
how often do you help others?	+2
how effective are you at explaining things?	+10
how often do you reflect on your work?	+10
how often do you try to improve work?	+1
how good are you at improving work?	+3
how confident are you about drawing?	+10
how much do you know about automata?	+10
how would you rate your making skills?	+5

Figure A2.7: Increase in self-evaluation scores post 'Make Your Move' workshop two (2016)

Fostering agency

- self-efficacy
- self-regulation and collaboration
- idea generation
- self-evaluation and continuous feedback

Self-efficacy demands effective communication skills and good social skills. Self-regulation promotes thinking about how behaviour and approach impacts upon the learning opportunities of self and others. Developing participatory skills and learning how to get the best out of a group nurtures self-efficacy and self-regulation. Halstow School's culture and ethos is based upon helping others on an everyday basis and so the culture of the school is conducive to the pedagogic aims of 'Make Your Move'. This may not be the case in all schools or across geographic boundaries. The pilot group worked constructively together, along with the class teacher, a student-teacher and the researcher. It became clear that children in the pilot group enjoyed the 'design studio' set-up and supported each other with enthusiasm.

How effective are you in a team?

Answers before the project ranged from so-so to quite good and the school culture promotes collaboration. Answers after the workshop all moved to the middle or high end of the scale (+10). The group worked together as a team for two days and there were many examples of partners and teachers helping to scaffold learning for other team members.

Necati explained: "When I finished making the cam box, you said I could help others, so I did – and found it easy and good." Amelie made it clear when she had received sufficient help from Necati. Learning when to help and when to let go took empathy and sensitivity. It was clear that Necati enjoyed helping and, when Amelie wanted to be left to get on, he handed the structure back and gave her space and time. This was a typical example of self-regulation and scaffolded learning in action during the workshop.

A fleeting moment of conflict emerged when one participant suggested the automata of their partner was "headbutting, not kissing, your mum" but dismay turned into laughter very quickly. Garton suggests that a theoretical explanation of empathy comes from demonstrating the ability of children to understand that others know things too, have beliefs and can think. One crucial means to such understanding is through collaborative problem exploration.

How effective are you at explaining things?

Three out of the four children felt they were 'okay' at explaining things and one was at the 'ummm' end of the scale. The three who saw themselves as okay all moved up to good by the end of the workshop and 'umm' moved up to okay. This question illustrated how children work at different levels and why knowing each child's level is important. It became clear that 'ummm' is a gifted communicator and was setting her quality of perception at a more critical level.

At the end of each hour of the workshop, a plenary session enabled participants to explain their position, search out new questions and offer help and support. This approach to explaining things 'by standing in the shoes of the other' became more fluent and more inclusive as time passed. Bearing in mind the small group size, this regular period of reflection provided an opportunity for all participants to express themselves. Being in such a small group meant this was productive but whole class discussions would need managing using a different strategy. The policy of no hands up discussion was new for some children but was successfully managed by the group – "It's no hands-up Matteo..." The proposition is that developing skills that support communication and teamworking at an early age may reduce some of the difficulties faced in adolescence as a result of dissonance. Developing co-design skills and learning how to get the best out of a group also nurtures self-efficacy and self-regulation, skills that foster agency.

How often do you reflect upon your work?

The meaning of reflection was discussed with participants at the beginning of the pilot project to help determine their pre-workshop positions. All four children felt they reflected on their work 'fairly often' before the workshop took place and three out of four moved their assessment up to 'quite often' at the end of the workshop. One participant felt that they continued to reflect upon their work on a 'fairly often' basis. Reflection, for Boud et al. (1985), is an activity in which people recapture their experience, think about it, mull it over and evaluate it. Participants were asked to reflect upon their work by repeating drawings, re-making models and re-drafting their personal stories.

Reflection, for Boud et al. (1985), is an activity in which people recapture their experience, think about it, mull it over and evaluate it. Participants were asked to repeat drawings, re-make models and re-draft personal stories and all those involved in the pilot illustrated effective and fluent methods of reflection in action. Class teacher Isabel explained: "Over the duration of the workshop, the children developed their 'voice' and began leading the conversation with less prompts as time

went on – they questioned each other, listened to each other and responded to each other in a way that the pace of the classroom doesn't always allow.”

How often do you try to improve your work?

All four children, before the workshop, suggested that they tried to improve their work ‘a lot’ and this did not change after the workshop. The sample was not randomly picked, and it is likely that the children selected to be part of the pilot were considered to be engaged and committed to learning. Participants completed the evaluation sitting round one large table, so they could see the answers others were selecting and this may account for the fact that some sets of answers were the same.

The pilot group were resilient when it came to re-drawing to help develop their design ideas and re-making the wire drawings. When the automata did not work in the way intended or students saw how their model could create more of an impact, they repeated their work with commitment and innovation. For example, Ellie wanted to keep the model of her and her mother hugging as a static model once it was made, so she made additional models of small birds flying above their heads as the moving part of the automaton.

Developing metacognition

- drawing as thinking
- planning, storyboards and oral language interventions
- focus and concentration
- small group discussion

During the workshop, student-teacher Charlotte picked up on the metacognitive strategy of wait-time and second wait-time. This translated into sketching, prototyping, and model making aimed at continuously improving work in hand. One of the participants moved from very expressive drawings of her mother to drawings that she used as studies for wire model making. This required a sophisticated level of skill to change her drawings to ‘fit for purpose’. Charlotte applied her drawing and literacy skills to helping pupils look closely, think deeply and experiment with confidence. Her engagement in transferring ‘Make Your Move’ from pilot to whole-class highlighted the role of creative practice in developing agency and in teachers as well as in primary students (**Figure A.29**).



Figure A2.9: Work in progress by Charlotte, the student-teacher. Photograph courtesy of Charlotte Stirling

How good are you at improving your work?

Three out of the four participants felt they were good at improving their work and one felt he was between okay and good. Three participants felt that they were better at improving their work at the end of the workshop, the fourth was ambiguous (+3).

After having been introduced to the wire drawings of Alexander Calder, all four children moved their drawings forward in a way that projected greater character and design awareness. Three moved from drawing stick figures to making line drawings of figures showing form and volume in a Calderesque manner. The degree of transformation was remarkable and it was clear that the design and making methods introduced to the pilot group had been grasped and acted upon. Charlotte, the student-teacher, grew in confidence as she helped children to develop their drawings, take action-posed photographs and begin to draw in three dimensions. She was able and motivated to apply her drawing and literacy skills to encourage pupils to look closely, think deeply and experiment with confidence.

During the process, Charlotte picked up on the metacognitive process of 'wait time and second wait time' which translated into sketching, prototyping, and model making aimed at continuously improving work in hand. According to Charlotte, the extent of re-making was curtailed in the whole-class workshop but the energy and commitment to improvement remained.

How confident are you about drawing ideas?

The workshop began with the researcher expressing his opinion that everyone can draw and that all drawings were valuable. None of the children seemed to have a problem understanding his position. Three students were confident enough to score themselves in the middle of the scale in the pre-workshop questionnaire. Answers post-workshop, were at the high end (+10). Matteo started by evaluating his drawing skills as 'ummm' (low end) and after the workshop as 'quite good' (high end) which members of the Learning Circle felt reflected the fact that he began to think through drawing in order to visualise insights.

How much do you know about automata?

Three out of four pupils felt that they knew between 'a bit' and 'a good bit' about automata before the workshop and all moved their evaluation up to 'a good bit' after the workshop (+10). A student who felt that she knew 'more than a good bit' before the workshop revised her evaluation to 'slightly less than a good bit' after the workshop. This showed self-regulation through discovering that designing and making an automaton, rather than simply playing with automata, lead to deeper learning.

Amelie moved from middling pre-workshop to slightly above middling post-workshop. Her drawings, design skills and making skills were at a high level relative to the rest of the group and she thought deeply before answering the questions. Amelie did not over-state her capability and demonstrated that there are different levels of thinking and different criteria being applied to self-evaluation.

The workshop included a demonstration of how cams work and an exercise in building a simple automaton using a wooden cam, slide, follower and shaft in a cardboard chassis. The students did not know the names of the components of the mechanism, or how they fitted together, at the beginning of the workshop. The reason why they rated themselves highly at the pre-workshop stage may reflect a strategic choice made concerning assessment as a normative measurement of level, as opposed to evaluation as reflection and planning for learning through metacognition. There is a question mark over why both boys rated themselves relatively highly and both girls rated themselves at a lower level.

How would you rate your making skills?

All four participants rated their making skills as 'good' before the workshop and 'good' or slightly better than good after the workshop (+5). Amelie evaluated her making skills higher than any other participant. Her skills in drawing and making flourished over the two days and her personal story was well-conceived and fluent. As her confidence grew, so did her creativity and self-efficacy.

The models, photographs and videos provided a record of how the nature and quality of drawings developed over time. Charlotte, the student-teacher, noted:

Every child could see their drawings, and the drawings of their peers, improve as they moved from very basic stick people to Calder-like figure drawings. Moving from developing expression and feeling on paper to producing wire-drawings illustrating animated poses and movement flourished. We could see, in real time, confidence and thinking developing over the course of the session."

Critical reflection helped to ensure that the 'thing' being made was continuously changed and developed which demanded resilience on the part of the children and the teachers. Erin shared her feelings, supported by other participants with nods and smiles. She said: "I couldn't believe we could make such amazing things from rubbish – stuff you could find just lying around in a corner or in a rubbish bin..." Amelie added: "The thing about using rubbish is you don't mind messing about - if it doesn't work then you can just change it."

Global goals

- reflecting on sources of renewable energy
- discussing empathy and compassion
- reflect upon local and global connections

At the end of each hour of the workshop, which ran over two days, a plenary session enabled participants to explain their new positions, search out new questions and offer help and support to others. This approach to question driven explanatory reasoning became more fluent and more inclusive as time passed, which provided an opportunity for the whole group to reflect on their position and move forward. Being in a small group meant there was sufficient time 'to think again'. Isabel, the year 6 class teacher, explained:

During the 'Make your Move' workshop, children began by discussing their understanding of sustainability... it was great to take a step back and hear them apply prior knowledge to an

organic conversation. They began by discussing solar panels and wind power - ideas and knowledge they had explored before. But as the conversation progressed, their thoughts seemed to become more philosophical and they began to question their own ideas, for example: "I was thinking... is a bird flying sustainable? I suppose it is but then maybe it runs out of energy, maybe its wings get tired."

The Institute of Education (2012) found that global learning at primary level helps to nurture responsible global citizens, enhancing student awareness of diversity and supports mutual respect. Children at Halstow, when working as a design studio, asked inquiry-based questions such as "Is gravity really a renewable energy?", and offered alternative propositions and interpretations.

Designing change

- collaborating on making – scaffolding mastery?
- discussing the perspective of the other – democracy and dissonance
- design as an expression of care - raising awareness

How often do you help others?

All participants selected 'often' in answer to this question 'pre' workshop and often in answer to this question after the workshop (+2). The school culture supports helping others on an everyday basis so the outcome did not come as a surprise to teachers on the Learning Circle. This question was scored higher by all participants than the question: "How effective are you in a team?" Discussion related to the difference in meaning between these two sets of answers provided a useful insight as helping others and working collaboratively are viewed as distinct. Necati explained, "If someone needs help that's great but when I am working in a team I don't always agree."

Necati's self-evaluation illustrates the significance of cognitive dissonance and the acceptance of difference or change without antagonism. In the pilot group, he worked constructively with others while expressing his views clearly, which helped to foster a culture of participatory design and enquiry. It became clear that children in the pilot group enjoyed the 'design studio' set-up and supported each other enthusiastically and moved quickly to performing effectively as a team. On comparing how the studio differed from a 'normal' classroom Ellie said, "...it feels like real life where you help each other."

Empathetic action coexisted with a debate concerning compassion when Matteo asked a question related to giving a person money in the street, the subject of his automaton. This increased cognitive dissonance (Festinger, 1957) as different opinions emerged through question-driven explanatory

reasoning which, according to Graesser (1996), develops independent thinking. Participants discussed giving money to people living on the street, including the responsibility of the individual, society and government.

Student-teacher Charlotte transferred a revised version of 'Make Your Move' to a whole-class workshop with support from the students who took part in the pilot. Feedback from Charlotte was that the transition was effective:

...and difficult at times because peer to peer mentoring meant children had to explain things and demonstrate how drawing helps to develop ideas. When it was made clear that everyone is part of the 'design studio', working in small teams of four or five, the response was positive. Children from the first workshop helped mentor the groups in a brilliant and caring way. Watching the children helped me to see what worked and what needed tweaking, so it was what you would call a great 'agentive' learning experience.

Such positive feedback suggests that effective communication, drawing and making may help to nurture self-efficacy, self-regulation and agency (**Figure A2.10**).



Figure A2.10: 'Make Your Move' before and after self-evaluation (2016, Photograph by Charlotte Stirling©)

Reflections

Tom Gray, the head teacher of Halstow Primary School, felt the approach to learning and teaching in 'Make Your Move' "...fostered original ideas, methods and interpretations, performed by children and teachers." These original aspects of the workshop were the result of transferring signature pedagogies from art and design and fostering making methods, such as iterating 'back and forth', sketching and drawing, constructing models and prototypes, and narrating personal stories through storyboards and moving toys.

Six months after the pilot workshop Matteo explained how he felt looking back on the experience:

I felt excited because I knew this story was going to become something more than just my story – a story that everyone could see in 3D and a story that would never be forgotten. Sometimes if you just say something people don't listen, but this was like 'holdable proof.' I felt like if someone saw this, it could affect how they chose to behave and also make them want to create something out of their own personal stories.

When class teacher Isabel asked Matteo in what way 'Make Your Move' was different to the way he would normally learn in school his response was compelling:

It's kind of like bringing together DT, art and literacy. In school we don't normally bring those subjects together – in literacy you normally have an aim decided by the teacher, but this was more 'free' and more for us to decide. We had to decide on the story and on what our characters looked like. It made me feel kind of like a master. I dunno... in charge.

The subject-specific nature of the primary curriculum was 'traversed and transcended' through a constructivist approach to learning through design and making. It was surprising to learn that a participant assessed as "performing below the average level for his age in some core areas of the curriculum" illustrated a remarkable level of engagement and competence in designing thinking and making. Numeracy and literacy are instrumental in the pursuit of an effective education but that is, according to Herbert Read (1949), the sum of what they are. Developing self-efficacy, and self-regulation in pursuit of discovering what it means to live a worthwhile life is, according to Dewey (2011), the true purpose of education.

Isabel believed the pilot workshop had a beneficial impact upon the whole school. She said:

'Make Your Move' generated enthusiasm among teachers and children. As a result, the global goals have informed much of our learning this year already, and will, in fact, be the theme for this year's Arts Festival. The Global Goals can come across as too 'big' for children

– and for us - to comprehend. ‘Make Your Move’ focussed on personal experiences of compassion which meant that children could see how the ethos and values really do apply to their daily lives, discussions and actions.”

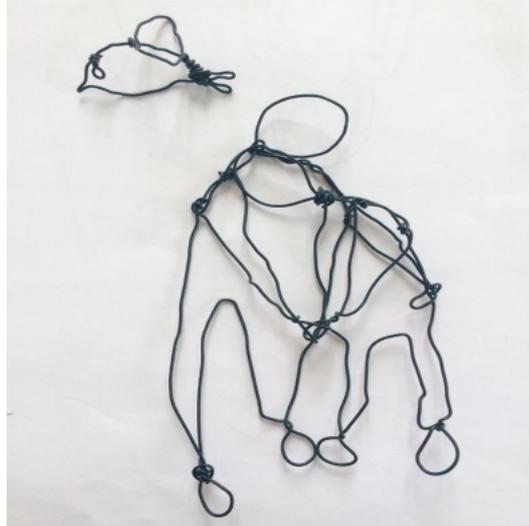


Figure A2.11: ‘Mother and Child’ by Erin, Halstow School (Photograph courtesy of Charlotte Stirling ©)

‘Make Your Move’ set out to develop empathy and compassion, which is fundamental to sustainable development, by taking an interpretivist research approach which was ‘situation-specific’. It is not possible to generalise with such a small sample but it is possible to highlight potentially insightful findings, worthy of further investigation. These insights apply to Halstow Primary School for whom the outcomes and observations proved to be valuable. Working with an able and committed class teacher and student teacher demonstrated the value of continuing professional development. The importance of the reciprocal exchange between teachers, children and the researcher should not be underestimated in an environment where the burden of work and the scarcity of resources is increasing.

The open culture and pedagogic style at the School meant that Project Centred Learning was not difficult to adopt by teachers and children. Introducing the project to other schools, nationally and internationally, may well provide different insights which are contextually and culturally specific. Local Learning Circles and pilot projects help to determine the potential for developing personal agency and empathy through creative workshops and help to inform how the approach taken may be adapted to local circumstances (**Figure A2.11**). The UN global goals help to develop a culture of cosmopolitan localism (Manzini and Coad, 2015). The concept of cosmopolitan localism is a building block for a more sustainable way of living that is defined by Manzini as a ‘Multi-Local Society’.

Appendix three: Halstow Primary School whole-class lesson



Figure A3.1: 'Make Your Move' run as a whole-class lesson by Charlotte Stirling and exhibited at 'Artsweek' at Halstow School (2016)

Halstow School workshops - References

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Appendix four: Research Led by Professor Sen at IITB

Indian Institute of Technology Bombay (IITB) Translocated Learning

Dr Ajanta Sen Poovaiah

Location: IITB

Date: 17 October 2017

Email

Dear Bob,

Good afternoon to you!

It had never occurred to me that the children who had participated on Solar Project - mostly in the age band of eight to twelve at that time, are today in their thirties. Grappling with the conundrums of the education system that affect or ail their own kids. Perhaps we could do a joint paper that explores the generational cross-overs and other milestones.

Our session with the school is slated for tomorrow, in the first half of the day, after which the schools shuts down for a week or so for the upcoming Festival of Lights that we call Diwali. It will be a group of about fifteen children from primary school. Your suggestion of speaking to the teacher about taking this forward could also be done once she has observed tomorrow's activities. Once the schools reopen, we will conduct another session with a school for underserved, economically under-privileged children (inner-city kids as Americans call them).

Preparatory to this, we have first tried to interpret the "probe" box and its various objects, and what meanings underlie these objects. I have visual documentation of this process showing how four different members experienced the "probe" box with their respective filters/outlook, and the resulting outcomes. We have also spent some time brain storming ways in which your research objectives may be translated/"tested"/seen in action on the ground, the results of which have also been documented. Through brainstorming, we have come up with the idea of engaging children through.

(a) taking a specific Millennial Goal for the pilot in order to achieve something concrete. To this end we have selected Water (as one of the Millennial Goals), taking into account the simmering water woes inflicting Bombay, which has recently seen both acute water shortage (during summer last year) as well as phenomenal levels of flooding (on 29th August this year);

(b) storytelling as a way to 'nudge' in the important (societal) questions/issues arising out of the Millennial Goals (in this case, related to water), and in the process creating 'participatory' learning for problem-solving. For this we will enact out a play/skit that will essentially draw in the children to participate and ask+answer relevant questions. We will use two modes for the two schools. For tomorrow's session, it will be storytelling where the questions are largely framed by the facilitators. For the next session with the inner-school kids, we will experiment with an open structure with questions framed by the children;

(c) introducing the idea of a 'bioscope' that children will make and which will become a tangible, fun object through which to articulate their solutions generated from the problem-solving session;

(d) since the bioscope requires group viewing, it will foster the need for 'collaborative' learning practices without the need to get competitive;

(e) encouraging the use of 'Hinglish' and local language intonations to make children feel comfortable in their skin, and in the process usher in a cross-cultural frame of reference, whereby the researcher recognizes the power of the agency of diversity and the 'local'. Incidentally, the choice of the 'bioscope' itself is deeply culturally-laden with significance since this continues to be a chosen mode of image-viewing in rural and small town India.

For the purposes of the school experimentation, I now enlarge your research objectives as interpreted by us at this end:

(1) The need for the UN Millennial Goals to be fostered from a very young age amongst children. Hence the need to take these into school environments. To that end, put into play a number of tools of action (such as the ones below).

(2) The need to foster collaborative, participatory learning amongst children, with teachers as facilitators.

(3) Recognizing the agency of storytelling as a vehicle of communications, especially in culturally-mediated spaces, such as in countries like India - and putting into play via story-telling, a 'theater of imagination'. As also using storytelling to nudge in the much needed societal issues on which the Millennial Goals are premised, without making children self-conscious about asking these questions. For this, we have designed a skit to engage the children. The skit replaces the conventional Q&A mode of interaction.

(4) The need to introduce into conventional school curricula the powerful agency of design, viz., the act of "making", since children are anyway predisposed to learn by "constructing" information from

their own environments. This powerful force of constructivism is tragically subverted by rote learning/cognitively-heavy methods of learning that our conventional education systems tend to follow.

How can we then activate a process whereby we encourage children to articulate their ideas that arise from their everyday life concerns (in this case, being projected through the Millennial Goals)? And help them translate their ideas through a tangible process of 'artefication' whereby children construct their own solutions to problems (that have tragically been foisted upon their young shoulders by an older generation). And yet, remaining light-hearted and forgiving enough to carry out problem-solving in a playful manner, where they don't feel burdened with the responsibilities of problem-solving.

In other words, by invoking the playful qualities of 'making' that design embraces, and creating solutions through design, children could become early participants as 'global citizens' (since these are all global/universal problems) but often requiring local solutions.

(5) Finally, as part of this latent concept of global citizenry, where diversity and localization become the only ways to create access to resources and information and ensure in democratic ways of interactions, can we experiment with the above by invoking cross-cultural frames of references, if at least to understand what valuable lessons that the 'making' of design and constructivist knowledge-play by children hold for other countries?

Can we draw lessons from cross-cultural experiences of the same Millennial Goals but played out differently on the ground by different countries through different cultural norms and practices?

I will send all outcomes as a documented process. One thought is to convert all the images recorded and to then string them into a narrative of the entire process into a stop-motion animation film that starts with the opening of the "probe" box into the making of the 'bioscope' itself. Which you could then present to your panel.

More later.....Ajanta

Student design and research team: Ashwini, Shruti and Aakash

1. Apprehending the brief

Aakash was the first to be introduced to the research problem based on reading the mail conversation between Robert and Pr.Ajanta, where Robert explained different aspects of his research. Later on, all the team members had a face-to-face meeting with Pr. Ajanta and the

research problem was discussed at length. Based on the initial understanding, the research seemed to focus on three related objectives:

- a) Exposing primary school children to UN global goals and creating awareness about them
- b) Promoting child's agency through design thinking and act of making
- c) Understanding the cross-cultural aspects of global goals by looking at the concerns and themes that play out in the minds of children from different socio-cultural backgrounds, and also the differences in the mode of expression itself, again affected by the culture.

The three inter-related objectives were later shuffled in priority, in the process of conducting research over time.

2. Understanding/exploring probe box

Probe box was opened up and spread out. All the team members interacted and explored the different elements of probe box individually. After the individual interaction, team members discussed their interpretations and collaboratively understood the idea of probe box.

The initial interpretation was that all elements were separate and used in different 'making' exercises with children, giving them mediums of expression e.g. ink stamped leaves or digitally printing leaves were individual exercises of expression. The wire character seemed to be a protagonist who was either telling a story or conducting the making exercises. Over a period of time, one of the group member (Ashwini) noticed that there could be an overall theme of 'seasons' which connected all the elements together in the probe box. There was a consensus on this interpretation. Following this, the team noticed that there was an image attached in the probe box which showed how all the elements could be physically attached together and we tried to achieve the same by physical manipulation of probe box elements. Finally, the team felt that the wire character was a storyteller who stood on a base made up of different elements of seasons and nature, and talked about them to the children. This was expected to be the output of the making exercise.

Following assumptions were made in this stage at different points of time, some of which were either substantiated or negated later:

- The probe box activity does not directly reflect one single UN goal, but used to probe a set of multiple goals related to nature

- Children were introduced to the mediums of expression first, and they expressed using the act of making within the confines of that medium
- Probe box consists of a series of individual making activities (later we realized that the output of individual activities came together into a single artefact)
- The wire character seems to the narrator of story and is placed in the context by putting him at the centre of the disc.
- The overall theme seems to be around nature and changing seasons, and how it affects the living
- The probe box also serves as an initiator of discussion on specific topics among the children

3. Brainstorming

After developing an initial understanding of the probe box sent by Robert, the team members conducted a set of brainstorming sessions with the objective of creating culturally contextual alternative of theatre of imagination exercise, which would lead to ‘making’ of an artefact with Indian primary school children. At this stage, it was decided that within the time and resource constraints, the exercise would focus on only one of the UN global goals. Considering the series of recent events in the city related to the issue of water, including flooding of Mumbai city, scarcity of drinking water, etc., the goal of ‘clean water and sanitation’ was selected to be probed by the children through the theatre of imagination exercise.

The first brainstorming session among the team members focused on all the different keywords which were related to water. The second brainstorming session focused on keywords of culturally contextual making activities which primary school children would associate with. Lastly, these two set of keywords having been written on separate sheets, were matched to create interesting possibilities of exploration leading to ideas of theatre of imagination exercise.

From the set of possibilities, a combination of bio-scope and pop-up art was selected, termed as pop-up bioscope. Bioscope is an Indian artefact which reflects the idea of using narratives and story-telling considered to be a significant aspect of Indian culture. Storytelling could be used to facilitate conversations and open door of communication with the children, and pop-up bioscope would be the tangible medium of expression of these ideas, also bringing the notion of three-dimensionality.

4. Preparation of workshop

- a. **Logistics:** The team decided to conduct a one-day workshop of short duration (1-2 hours) with the primary school children of Campus school within the IIT Bombay campus. The school principal and administration was communicated and the objectives of workshop were discussed. The school allotted 1 and a half hour duration to conduct the workshop with five students each from standard 3rd, 4th and 5th. The class teacher suggested that the language of communication for the workshop to be preferably Hindi, which was implemented in the workshop. One uncontrollable factor in the scheduling of the workshop was that the slot was available on the last day of the school, when children's exams got finished and their two week Diwali break started.
- b. **Detailing of workshop plan:** The first step of the workshop would involve introducing the UN global goal of 'clean water and sanitation' to the children. Team felt that using a didactic approach and heavy terms wouldn't be an effective engaging strategy, and hence it was decided to use an interactive skit to introduce the different issues related to the goal of clean water and sanitation. The actors will perform small acts and narrator would include children between the dialogues, initiating discussion upon the issues being discussed in skit. Interestingly, this activity also seemed to literally reflect the idea of theatre of imagination.

This step would be followed by the activities related to making by children. The team ideated on several possibilities. The initial decision was to continue the act of storytelling through the children by forming a circle and making children create and tell a part of story, as it would develop serially. However, there was an apprehension that completely unstructured storytelling activity might lead to enormous number of possibilities, with a high chance of children getting distracted from the focus on goal of clean water and sanitation. An alternative emerged in the discussion where children would be given the different issues related to water and they would reflect on what children perceived were the problems related to each issue and what solutions they felt could be implemented to improve the situation. This activity would also save time taken to create narrative. After a meeting with Pr. Ajanta, team decided that it was important to continue the theme of narrative and storytelling, and the final version of making exercise to be given to the children combined both the initial ideas, retaining their advantages. The final exercise would include the act of creating stories together in a circle but to ensure that the focus

was not lost completely, the children would create stories using chits which contained the issues related to the water. More details are discussed in the next section.

- c. Detailing and development of material:** Next step in the preparation of workshop involved creating the workshop material that would be given to children, to lead finally to the development of pop-up bioscope as the output. Hence, the team started exploring the process of constructing a pop-up bioscope. Considering the time constraint, the team in consultation with Pr. Ajanta, decided to use an existing flip-book model and improvise upon its mechanism to create pop-up bioscope. While working upon the mechanism, we realized that the initial conception of pop-up frames would not work because each frame will have to be divided into two parts and come on different sticks to work similar to the flip book mechanism. It was decided to use a simpler version of pop-up with figure (characters of narrative) and background (narrative scene). The figures would be cut and pasted on half of the background using thick tape giving a depth (three dimensionality). The dimensions of bioscope were noted, which also defined the size of frames to be drawn by the children. After several iterations and testing, the team figured out the algorithm of how the frames need to be cut in half and arranged to work in the flipbook mechanism. Thick card paper was cut in the required dimension to be given to the children for drawing their concepts. Other necessary material like pencils, colours, glue and scissors were procured for the workshop.

Following assumptions were taken during the preparation stage in the planning of the workshop:

- We expected that children from the campus school would be representative of different sections of the society, considering that the school had children from varied socio-economic background (later on this assumption was felt to be correct based on workshop experience)
- We considered the possibility of inertia from the school in using a different, interactive and participatory approach for the workshop to create awareness towards UN global goals, which is quite different from the standard, didactic model of instruction (this assumption was found untrue, since the principal was very receptive about the whole workshop plan and

even requested a follow-up meeting to see the possibility of using this model in their curriculum).

- We expected that children might need some ice-breaking and warm-up activities to encourage participation, and hence an interactive skit helped in addressing this concern (this assumption was found to be untrue, since children were generally warm and enthusiastic about the workshop even at the start)

5. Conducting workshop at school

As planned, the workshop was conducted on 13th October 2017 from 10.45 am IST, after the children had finished their final exam and have had a break of half an hour. The series of events which took place chronologically are reported as follows, including some of the improvisations which had to be made in order to conduct the workshop:

- a. Children were invited in the workshop space which was one of the classrooms at the school with ample space. While the children started settling (not all children were present beforehand, and it took around 10 minutes for children to come and settle), cameras were positioned and the team reassessed the whole plan.
- b. Since the children were excited about the start of vacations and restless, we quickly began with the interactive skit with a narrator introducing the idea of skit. During the skit, narrator would interject at specific points and invite children to express their opinions and facilitate discussions. The script of the skit consisting of two actors representing an old man and a household lady, is as follows:

Narrator: Aaj humare dost ek rangarang naatak prastut karenge (this script needs to be translated probably for sending to Bob)

Old man: “Haan?... Kaisa rang beta? Ee ka holi hai? Bachhon batao, holi aa rahi hai ya Diwali?”

Children shout “Diwali” together

Old man: “Acha chalo, peene ka paani la do zara beta... Badi duur se aaya hu mai”
(looking at lady)

Lady: “Arey chacha.. kal se paani nahi peene ka.. tanker bhi nahi aaya”

Narrator: “Kya kisi ko is tarah ki problem ke bare mai pata hai? Kya aapne kabhi aisa hote dekha?”

Children enthusiastically start talking about their experiences through anecdotes.

Children are also probed to think about why and how this issue should be solved.

Old man: "Acha to beta kuch khaane ka dede"

Lady: "Chacha khana bhi nahi bana sakti.. poore kitchen mai paani bhara hai.. sink mai kachra atak gaya"

Old man: "Kachre ki wajah se?" (looking confused)

Lady: "Arey kitchen ki baat kar rhe ho, 2 hafte pehle poore Mumbai mai paani bhar gaya tha isi wajah se"

Narrator: "Kis kis ko yaad hai abhi Mumbai mai rains ki wajah se jo problems hui thi? Kya kya problem hui thi aur kyu?"

Children enthusiastically start talking about their experiences through anecdotes.

Children are also probed to think about why and how this issue should be solved.

Old man: "Yahan baadh aa rhi hai aur wahan M.P. mai to kisaan dukhi hai sooke ki wajah se"

Narrator: "Kya aapko pata hai India mai ek saath kahi baadh aati hai to kahi sookha padta hai? Aisa kyu hota hai"

Children express their opinion on possible causes and think about why and how this issue should be solved.

Old man: "Chalo fir chodo, mai baahar hi kuch kha ke aata hu.. Tum sabko Happy Diwali!!"

Children shout Happy Diwali together as the old man and lady leave

Narrator: "Hum logon ko samaaj ko jaagruk karne ke liye kuch karna chahiye.. Chalo hum milke iske upar kahani banate hain"

Children show affirmation with excitement. Skit ends.

- c. Next step involved group formation among the children. This process was gamified as follows:

Children were asked to speak the numbers 1 and 2 in serial order, moving from left to right. This would mean that consecutively children would say 1-2-1-2 and so on. Now all the children saying 1 were told to sit on left row while all the children saying 2 were told to sit on the right row, with an empty row between the two groups.

Children were now asked to make pairs with the child sitting next to them, within their rows.

Children found the element of surprise in the pairing process to be fun. This step also ensured that children who were sitting adjacently earlier, which would generally be friends, were not paired together. The element of friendship was normalized because we felt that within pairs of friends, both children may easily agree on idea from their friend and not equally express their ideas. Having social groupings that had familiarity yet not strong friendship was seen to be an ideal range for eliciting democratization of expression of opinions among the children. This step was also the initiation of collaboration by agreeing to the rules.

- d. Having formed the pairs, each pair on left row (who chose number 1) would draw a secret chit and keep it hidden. Similarly, each pair on right row (who chose number 2) would draw a secret chit. By design, there were 6 relatable issues related to the goal of 'clean water and sanitation' which were given to both rows. Now the pairs in left row opened their secret chits one by one and read it out loud. This was followed by the pairs in the right row doing the same. Whenever there was a match in the issue between the pairs from left and right row, they were declared as a group. Eventually, there would be six groups which would be formed who would sit together. Children were then informed that pair from left row will express the different problems which they feel are caused by the issue in the chit, while pair in the right row would think on possible ways or solutions to tackle the problems related to the issue.

The idea of using secret chits was seen to be engaging and fun for the children. Again, the build-up and emergence of groups formed by luck was liked by children, as seen in fun and teasing shouting of children every time a group was made. Thus, gamification was implemented through these steps.

- e. In the next step, all the pairs were asked to form a circle, with 'problem' pairs in half of the circle and 'solution' pairs on the other half. Children were then introduced to the character of bird (played by one of the team member) and were given the starting line of the story: "Ek baar ek chidiya udte hue ja rahi thi, tabhi usne dekha...". Now, the plan was that bird (enacted by the team member) would fly to each 'problem' pair, and then that pair would explain the scene of what happened when the bird visited. Eventually, having come across all the problems, the bird would become sad and go to turtle for advice. Then the turtle would go to all

'solution' pairs and collect ideas of how to resolve the problems. The children in the pairs had to quickly think of their part of stories together. This exercise was seen to be fun and spontaneous. However, since children took time to make their stories and only one pair expressed the idea at a time, some of the other children started becoming restless. Hence, it was decided to improvise and let the bird character only fly away to the 'solution' pairs too, to save time needed to introduce the turtle character and speed up the process.

f. After each pair had made their stories in the previous step, all the children were now asked to sit and draw out their ideas, or make it in the form of visuals. Problem and solution pairs dealing with the same issue were asked to sit together, and seats were rearranged to create individual groups. The making process would happen in following steps:

- Each child will work on their own interpretation and expression of the story, visualizing it through sketches on rough sheets
- Then children in the same pair (either problem or solution) would collaborate and decide what elements from their sketches would go on the final frame. This was the frame cut-out in the desired shape to fit in the bioscope given to each pair. The pair will further divide the task between drawing and coloring the background, and drawing and coloring the figure (characters of narrative)
- Each group which consisted of a problem and solution pair would share and discuss the ideas sitting together, however at the level of group, it was not needed to come to a common output, since problem and solution pair will express separately on different final frame.
- After the drawing and colouring task was completed, children would cut out the figure (characters) and paste it back on background using thick tapes to create pop-ups. This step would transform the two-dimensional sketches into three-dimensional visualizations. We were present throughout this process to resolve any confusions that children had, and assisted them in cutting, pasting of pop-ups when needed.

g. The last step in the workshop was to create the final bioscope by taking children's frames, cutting them and pasting again on the sticks as per the identified algorithm to create the flip book mechanism. Then the bioscope box would be assembled as

the overall output and children would take turns to look through the bioscope at the final story and individual frames done by the children. This step would also bring in the element of ownership, often seen significant among the children. However, unfortunately due to lack of time, this step could not be performed and we only collected the individual frames (along with pop ups) from the children. It has been decided that last step would be performed after the reopening of the school to capture the expressions of the children and take their feedback, along with the feedback of the class teacher.

The film has nine sections:

Three of the nine steps are what were preparatory to the pilot workshop. While the remaining six were a part of the workshop itself.

With the caveat that the very last step, which constitutes the "making" of a "bioscope" as the final physical output of the "problem-solving" process, could not be carried out with the children as it was their last day at school. But, when school reopens, we will recreate the "making" of the bioscope as a hands-on experience by the children themselves.

After the first section that outlines the project objectives, each of the remaining eight sections has been separated by a set of blue and yellow paper graphics.

These blue sheets with yellow squares, are in fact, a representation of the interaction mode(s) adopted for each of the sections. These interactions have been carried out firstly among the facilitators in the pre-workshop stage as preparatory to the workshop. And then, between the facilitators and the children at school. Are sometimes collaborative,

You will notice that some interactions are paired interactions, while some others remain collaborative across the entire set of stakeholders of the workshop (facilitators and children), while the rest represent the children interacting as problem-solving groups.

At the end, it is the entire group that is supposed to work together as a collaborative enterprise in the "making" the bioscope

Here are the nine steps:

(1) Step One is represented by a set of blackboard and chalk writings that show the project objectives as originally stated by you + project objectives as later reinterpreted by us for our own context, for the purpose of the pilot.

E.g., instead of the entire range of the Millennial Goals, we have chosen to take Water as goal of our

choice to work with for our pilot. (We have also stated the rationale for it).

Perhaps we could take up a different Millennial Goal to experiment on our next workshop, which will be with underprivileged kids

(2) and (3): Steps Two and Three are represented by activities that are preparatory to conducting the workshop itself.

The first of these two steps, viz., Step Two involves the opening of the "probe" box itself by our facilitators, to unearth its mysteries!!!!

The second of the two steps, viz., Step Three involves a Brainstorming for ideas on how best to conduct the workshop. You will notice that the interaction mode depicted through the yellow on blue sheet is collaborative amongst the facilitators

(4) Step Four employs the tool of Storytelling through a "skit" through which the facilitators try to warm up to the children with the subject of Water as a problem situation. You will notice through the yellow on blue sheet shown at the beginning of this step that the interaction mode is one where the facilitators face the children as storytellers.

(5) Step Five involves through Gamification, the pairing of the children into groups. Those who say 1 represent a problem situation, and those who say 2 represent the solution. The facilitators give to the children little chits of paper that either show a problem related to water or show a solution.

The interaction mode is obvious "pairings"

(6) Step Six involves further Gamification, whereby the children are required to be secretive about the chits so that in a hide-and-seek manner the problem-chits can discover the right solution-chits. The children do this by a participant initiating a story and then each participant adding to the story to eventually string it together.

(7) Step Seven involves the act of Performance/Enactment. Whereby, the narrator, a bird (one of the facilitators), flies from child to child, each child representing a certain facet of the entire chain of water woes. The interaction mode is represented by a circle whereby children collaborate through discursive/dialogic mode to understand the water woes as an "ecosystem" of problems.

(8) Step Eight involves the problem and its solution being articulated as a set of drawings by the children. This is the first step in the "making" of a creative idea through thought process visualization that will eventually go towards the creation of a physical, tangible output.

Once the problem-solving has been represented through drawings, the children then make cutouts as a 3D process for creating "pop-up" images for a proposed "bioscope"

(9) Step Nine, the final step, involves the "making" of the bioscope itself.

On account of existential circumstances whereby the school had to break for the Festival of Lights (Diwali), the facilitators have pieced together a bioscope using the drawings and "pop-ups" made by children.

When the school reconvenes, the children will participate on the "making" of the bioscope.

The bioscope itself holds special cultural significance as an artefact for India. Where, even today, village and small-town folks gather on special festive occasions to view the experience of "moving" images through a bioscope.

For this reason alone, the choice of a bioscope, that emerged out of the brainstorming step had seemed apt. Not to mention that the essential viewing of the bioscope is also a collaborative act involving group viewing.

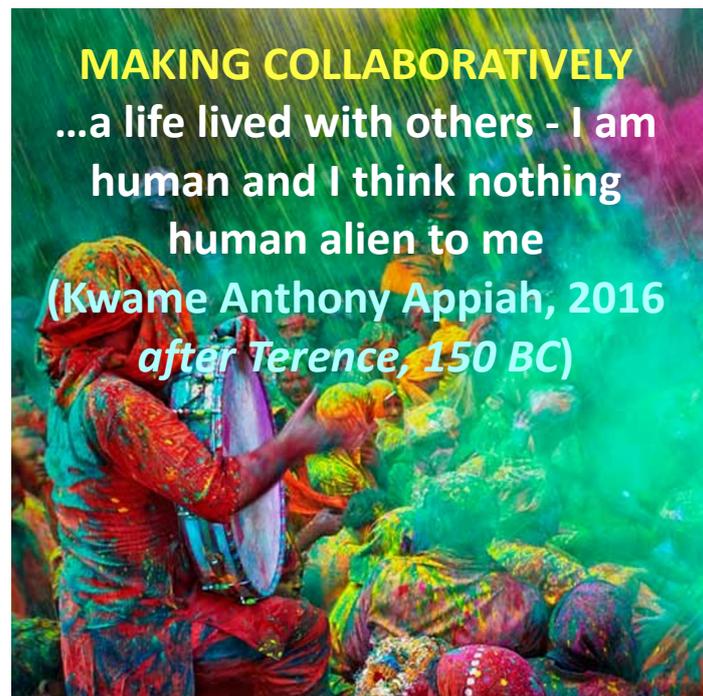


Figure A4.1: Making collaboratively (2018)

Appendix five: 'Theatre of the Imagination' Videos

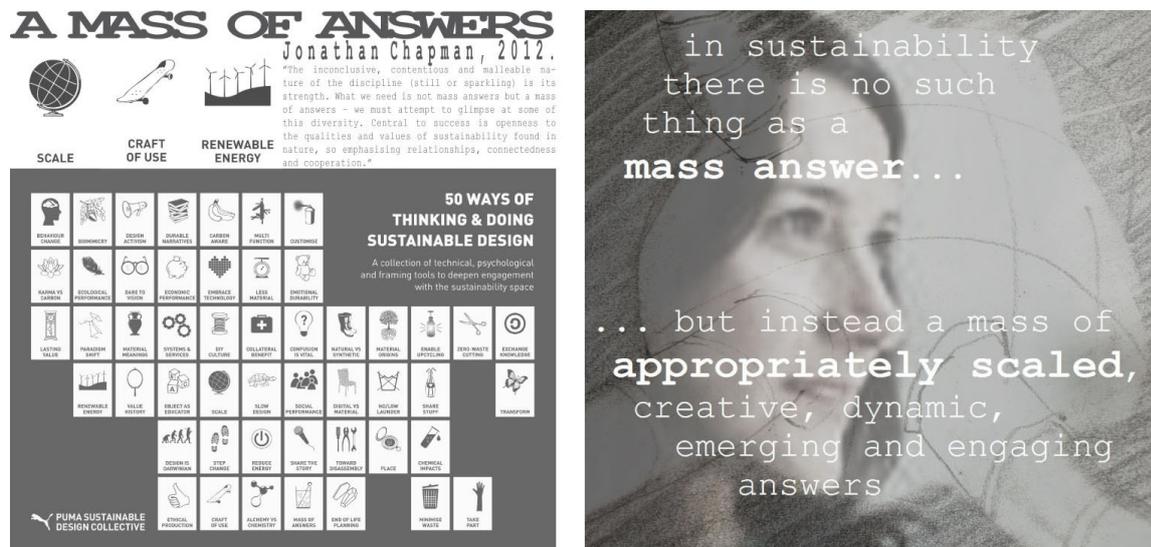


Figure A5.1: Jonathan Chapman and Kate Fletcher's work for Puma

1) Power of Ten: Principles of Sustainability

An historical account of environmental degradation based on Simon Dresner's (2004) 'Principles of Sustainability' and Ray & Charles Eames seminal film 'The Power of Ten'. This five-minute video depicts ideas generated by the researcher through 'Case Transfer' by 'standing on the shoulders of giants'. The video ends with a contemporary account, by Kate Fletcher (2013), of sustainable design as a ground-level activist movement, dependent upon a multitude of small interventions. This is a reflexive historical analysis which preceded the introduction of the UN global learning goals.

Evidence:

- Metacognition through declarative knowledge
- Abductive thinking through synthesising concepts
- Agency and reflexivity through selected readings
- Metacognition through the mnemonic acronym 'FRESH'

2) 'Theatre of the Imagination': UCA creative exchange

The Hockey Gallery, University for the Creative Arts, Farnham, provided an ideal venue for the first 'Theatre of the Imagination'. Curator Richard Hylton, and Head of School of Craft and Design, Robert Pulley, provided a wide range of ephemeral materials and tools laid out on a matrix of work benches

in the Gallery. Tutors, technicians and students worked together to imagine and make objects and spaces in response to the word 'connection' over a period of two weeks. The event was intended to be the first in a series that would link the four campuses of the University collaborative projects based on the surreal game of exquisite corpse.

Evidence:

- Agency through design and making through co-design
- Metacognition through design thinking and process knowledge

3) 'Kinetic aesthetic': pilot workshop one

Members of the first pilot group at Halstow School draw pictures depicting embedded knowledge and made a gravity machine using found objects. The project inspired the arts co-ordinator at Halstow to allow the researcher under take two workshops with Upper Key stage 2 students (9-11). The pilot group decided that a simple kit-built framework using low cost and everyday ephemeral materials that could be easily sourced or re-cycled in many locations around the world. Building co-design teams, engaging in design thinking while making helped initiate a discussion about gravity as a renewable energy.

Evidence:

- Agency through design and making in collaboration
- Metacognition through design thinking
- Agency through self-regulation and self-efficacy
- Metacognition through process knowledge
- Metacognition through declarative knowledge re. gravity machines

4) 'Kinetic aesthetic': pilot workshop two

Children at Halstow School worked in pairs and quartets to produce gravity machines using found objects and ephemeral materials. The researcher provided a simple structural framework to enable two teams to work in close-proximity in the design studio. Children produced storyboards using embedded knowledge, based upon life-experience, as a starting point to illustrate how gravity affects everyday life. The co-designed gravity machines demonstrated some of the thrills and spills children experience in the form of a game.

Evidence:

- Agency through design and making in collaboration

- Metacognition through design thinking
- Agency through self-regulation and self-efficacy
- Metacognition through process knowledge, declarative knowledge

5) **‘Make Your Move’: workshop one, Automata**

Global learning goals were introduced for the first time at Halstow School as a result of ‘Learning Circle’ discussion. Children learnt about simple mechanisms in preparation for making automata depicting an event in their life. Students stories are examples of embedded knowledge that have been translated into moving toys. The moving toys illustrated examples of compassion and the quartet supported and helped each other in the context of a design studio, working as a team. The children produced design drawings, wire drawings, stories, automata, and videos. The work was inspired by the UN global learning goals.

Evidence:

- Agency through design and making in collaboration
- Metacognition through design thinking
- Agency through self-regulation and self-efficacy
- Metacognition through process knowledge, declarative knowledge & global goals

6) **Make Your Move: workshop two, ‘Talking Pegs’**

Upper KS2 students at Halstow Primary school were the first to use wire portraits, made by students at West Dean School, for a ‘Talking Pegs’ video which captures a discussion about personal responses to the global goals. This exchange demonstrates how work produced in one school can be translocated to another to provide the stimulus for a new learning episode. The work is incrementally built upon by students in a different geographic space in the manner of an ‘exquisite corpse’, by re-framing a surrealist parlour game to support translocated learning.

Evidence:

- Agency through design and making in collaboration
- Metacognition through design thinking, declarative and process knowledge
- Agency through self-regulation and self-efficacy

7) 'Life on Land': workshop one 3D assemblages

Lower KS2 children at West Dean undertook drawing, printing and making exercises to develop haptic skills and personal Ideas related to 'Life on Land'. Design thinking is fostered by collecting 'things' on walks through the gardens for printmaking and 3D collages. The objects collected are used to provoke memories and through a synectic and abductive process, new ideas are generated and collated through storytelling. Persona cards were used to develop empathy by adopting an 'alternative voice'. Portraits made in wire during this workshop were subsequently used by children at Halstow School.

Evidence:

- Agency through design and making in collaboration
- Metacognition through design thinking
- Agency through self-regulation and self-efficacy
- Metacognition through process knowledge and co-designing
- Metacognitive, declarative knowledge through the global goals
- Metacognition through mnemonics and found objects
-

8) 'Life on Land': workshop two, 3D assemblages

Plywood sheets were prepared as the basis for a series of 3D assemblages. Children used ephemeral objects collected to co-design stories related to 'Life on Land'. In the case illustrated in this video, the story is an alternative take on the Garden of Eden and the first strawberry by a student who declared that he could not tell stories at the beginning of the workshop. The video also features two teachers in residence from South Korea who helped facilitate the workshop and who felt that they could translocate the experience into their schools. This was a breakthrough moment for the researcher.

Evidence:

- Agency through design and making in collaboration
- Metacognition through design thinking
- Agency through self-regulation and self-efficacy
- Metacognition through process knowledge and co-designing
- Metacognitive, declarative knowledge through the global goals
- Metacognition through mnemonics and found objects

9) **Life on Land': workshop two (a) 'Talking Pegs'**

Students at West Dean took the initiative to make Talking Pegs videos through improvisation. The result is a series of unscripted stories created through dialogue, using local landscapes as a starting point. These brought great jollity and lots of laughter to a serious subject made more engaging through the wit and creativity of children.

Evidence:

- Agency through design and making in collaboration
- Metacognition through design thinking
- Agency through self-regulation and self-efficacy
- Metacognition through process knowledge, declarative knowledge re. the global goals
- Metacognition through mnemonics and found objects
- Agency through improvised performances using 'Talking Pegs'

10) **Life on Water: workshop two: 'Floating Classroom'**

A project developed and executed by Innovation Design students at the Royal College of Art as part of the Lloyds Register Foundation research project: 'Safety on Water'. The research was directed by Ashley Hall and Laura Ferrarello, and the researcher was brought in as a sessional tutor to work with the Floating Classroom Team. Lower KS2 primary children, from the Paddington area of London, joined the Floating Classroom team for a day of designing and making. They produced automata depicting stories generated by incidents that happened during the day or that were conceived from the imagination. There is evidence in this video supporting the idea that design thinking and making, supported in a studio environment, encourages children to co-design and to try and try again. Metacognitive skills which support the development of agency are clearly depicted.

Evidence:

- Agency through design and making in co-operation
- Metacognition through design thinking
- Agency through self-regulation and self-efficacy
- Metacognition through process knowledge and co-designing
- Metacognitive, declarative knowledge re. the local Regent's Canal

11) Life Below Water: workshop one: ‘Bags of Fishy Stories’ (2017)

The Kodama team and the researcher joined forces to run the first research at Plymouth School of the Creative Arts (Appendix seven). The outcome was ‘Bags of Fishy Stories’ which were sent to the School of Design in Jerusalem and used as design probes in education projects by graduate students. The Kodama digital animation tools and the hand-made magical sea creatures workshop ran in parallel. A KS2 participant suggested using the hand-made wire portraits as characters in the Kodama digital video game. This is a compelling example of abductive thinking, born from a juxtaposition. The idea also exemplifies blended learning which might be applied as part of the enterprise.

Evidence:

- Agency through co-design and making
- Metacognition through design thinking and case-transfer
- Agency through self-regulation and self-efficacy in the studio
- Metacognition through process knowledge using design skills
- Metacognitive, declarative knowledge re. the global goals
- Agency through dialogic exchange focussing on the student voice

12) ‘Life Below Water’: workshop two (2017)

The second workshop built upon ‘Bags of Fishy Stories’. Participants designed and made more magical sea creatures using the wire bending skills previously developed to generate stories and character descriptions. Children organised a video-shoot, using school iPads, to capture their accounts of the special powers of their newly created animals. The workshop aimed to explore the global goal related to pollution in the seas. Living in Plymouth gave participants first-hand experience of the issue and were able to use this local knowledge to explore and understand the problem at the global scale.

Evidence:

- Agency through co-design and making
- Metacognition through design thinking and case-transfer
- Agency through self-regulation and self-efficacy in the studio
- Metacognition and process knowledge using video-making
- Metacognitive and declarative knowledge re. the global goals
- Agency through dialogic exchange focussing on the student voice

13) IITB: translocated learning based on global goals (2017)

An extraordinary account of 'Theatre of the Imagination' being translocated to IITB and developed as a whole-class session focussing on the UN Global Goal 6: Clean Water and Sanitation. Colleagues at IIT have been collaborating with the researcher over the past two decades. The workshop in India is being showcased in a National Exhibition with a view to running more workshops with 'street children' in Mumbai.

Evidence:

- Agency through co-design and making
- Metacognition through design thinking and case-transfer
- Agency through self-regulation and self-efficacy in the studio
- Metacognition and process and declarative knowledge re. global goal 6
- Metacognitive learning between primary and tertiary students
- Translocated learning through 'Theatre of the Imagination'

14) Theatre of the Imagine: Work in Progress show (2018, RCA)

A video summary of 'Theatre of the Imagination' was produced and shown in the 'Work in Progress' exhibition at the RCA in January 2018. The video provides an overview of the design researcher's work in mainstream, primary education over the past five years.

Four areas of potential new knowledge:

- Personal agency through design and making in primary children
- Metacognition through co-design and making in primary schools
- Global Goals as a framework for declarative knowledge
- Cognitive acceleration through 'Theatre of the Imagination'

Appendix six: Field notes from PSCA visit in April 2016

Most year 7 boys weren't sure about attending the fashion show put on by Plymouth College of Art students in their school last summer. But after experiencing the sheer theatre of the event, they changed their minds, says Andrew Brewerton, principal of the college (Swain, Harriet. (2016) *Wanted: Universities to take free Schools Higher*, The Guardian, Tuesday 22nd March): "Suddenly, they were in this environment they would only have seen in pop videos or in snatches on TV."

The event was one of many ways the college has enriched the experience of pupils at Plymouth School of Creative Arts. The college set up the free school for children aged 4 to 16 in 2013 with the aim of establishing a progressive continuum of creative learning and practice at primary, secondary and then through to master's level study and beyond. Interest in the model has already come from France, China, South Korea and America. Brewerton acknowledges that setting up a free school was risky, but he believes that art and design colleges have to seize all opportunities in a political and economic environment that is hostile to relatively small specialist colleges of the arts.

Nadia Edmond, principal lecturer in the school of education at the University of Brighton, who has researched different university-school interactions, says these exclusive relationships can be damaging. "They talk a lot about partnership with the community but it's undermining those partnerships because it is privileging particular relationships with particular schools and not others." She argues that it is all part of higher education institutions becoming transformed into businesses and looking for marketing and revenue-generating opportunities that stretch beyond their core activities of teaching and research.

David Eastwood, vice-chancellor of Birmingham University, which opened a secondary school last September, insists the potential benefits of university free schools are huge. Indeed, the university will consider over the next year whether to open another school or university technical college. Its decision to open a school, he says, was part of a commitment to improving opportunities for local children. "We saw it as a beacon for training outstanding teachers who would work for schools in the city and in the region ... and an opportunity to place emphasis on character education," he says. Sponsoring a school with an admissions system that ensures it is genuinely comprehensive but which pursues an academically challenging curriculum is also seen as playing an important part in the university's widening participation agenda. "Of course, some of those students will come through to the University of Birmingham," says Eastwood. "But it's not there as a recruitment initiative,

Principal of Plymouth School of Art, Andrew Brewerton, says one challenge is being involved in a government policy that is so controversial. When other art colleges learned of Plymouth's plans, he says, some opposed the idea merely on the grounds that it was a free school. He argues that if instead of 35 faith groups setting up free schools, 35 art schools had followed the Plymouth model, there would now be a national network of schools pursuing creative education.

The Architects - Feilden, Clegg, Bradley Studios

Plymouth School of Creative Arts, affectionately known as *The Red House*, has been designed as a place to develop the richness and individuality of human creativity. This all-through school, located on an inner city brownfield site, is sponsored by Plymouth College of Art. It allows 4-16 year olds 'to connect' through making, performing and discovering. The School and College pursue their intention of '*Creating Individuals and Making Futures*' through a unique continuum of creative learning from nursery school to postgraduate level. The school is a place for making things – making ideas, making technology, making art – for discovering how knowledge, values and language, identity or experience are made. It is a place of performance in the sense of performance as doing and of performance as achievement.

A creative educational habitat requires a departure from conventional teaching methods and spaces and requires an entirely new ecology. Industrial in character and varying in height, plan, light and scale, the school's design stimulates and charges the environment as a place for making ideas, technology and art.

Building good schools is a societal, political and educational challenge. The Red House embraces some Project Based Learning (PBL) where knowledge and creativity is encouraged to flow between teachers and peers. The Architects believe they have designed a new prototype for creative learning and the teachers, parents and children appear to agree with them.

The Building

The almost 7,000sqm building contains functionally specific zones, such as its theatre, teaching kitchen, labs, dance studio and music rooms. Large scale classroom spaces are designed around the philosophy of team teaching with 3 teachers and 75 children sharing sub divisible-spaces. There are sports facilities and dining areas which are available to the community out of hours.

The school was procured under the government's Free School programme, together with the English Cities Fund who owned the site, and is sponsored by Plymouth College of Art. The school was built

for £1,450/sqm – two thirds the figure for typical Building Schools for the Future – at a total cost of £10 million.

This school is a responsible re-use of urban inner-city land, sparing of green field alternatives, and a mark of confidence in the emerging community. The building uses robust, long-life materials and harnesses renewable energy. Onsite renewable technologies include a 250sqm array system installed on the roof, resulting in 17% reduction against predicted carbon emissions of the building. Its U-Values were increased to better its passive performance beyond building regulations.

The quality of natural light is excellent, while all light fittings are low energy with daylight controls and absence detection. Ventilation is tailored to the variable site conditions and administered by an intelligent BMS. Combinations of mechanical, natural and locally operable systems moderate the environment. The internal spaces are adaptable and can be colonised and repurposed when the need arises and landscaping and planting have been implemented for education and biodiversity and it has a roof-top apiary – it's buzzing.



Figure A6.1: Feilden Clegg Bradley Studios design for Plymouth School of the Creative Arts (2015)

Culture

Plymouth College of Art's vision for Plymouth School of Creative Arts grows out of an established art college ethos in response to the serious erosion of the arts and creativity in schools. The school is a place for making things and for discovering how knowledge, values and language, identity or experience is made. It is a place of performance in both senses: performance as doing; performance as achievement. A place of creative learning in all subjects.

The school's purpose is all about the transformation of students' lives and their life opportunities. The intention is to make sure that students achieve the academic qualifications and the '21st century skills' -knowledge, skills, work habits and character traits - they need to be successful. To help make sure the students develop to become the best they can be; young people who are

creative, confident, critical and resilient thinkers, able to contribute positively to the world in which they live, demands a meaningful, purposeful and effective process of learning and development.

The learning strategy ‘stands on the shoulders of giants’ by drawing on evidence, expertise and understanding from the worlds of education, psychology, neuroscience and social history. The school reflects approaches that have worked well, throughout history, within tribes, communities and cultures that recognised the value of working together to create something bigger for common good.

The school is a ‘learning village’, where learning and development is encouraged and enabled for every member of the school community. Creating a ‘learning village’ requires systems and processes that are different from typical mainstream schools and are distinctive. The purpose of learning is *Creating Individuals, Making Futures*. The practical features of learning are being developed to support a ‘learning ethic’ aimed at a successful transition into the world as young adults and project-based learning sits at the heart of a constructivist process of co-design and collaboration. Principal Brewerton explained:

“Year 7 and 8 formed a textiles company to create a set of cooking aprons for the pre-school. Students began by measuring pre-school students and choosing a style of apron which would fit the varying sizes of students. Working to a design brief which specified that the apron had to be washable and was to be used for cooking, year 7 and 8 students made four designs each to present to their student. The pre-school pupils then chose their favourite designs which year 7 and 8 students then made.”

Selected quotes from the college and school visit:

Ian Farren (Associate Dean)

- *“We have opened spaces up so people can see over and through”*
- *“Did you see the mother who came into school and started playing the piano?”*
- *“The ‘Firing-Up’ project produced notable outcomes related to learning through making”*

Majella Clancy (Life drawing and printmaking tutor)

- *“People are making life drawings and prints almost simultaneously”*
- *“This is drawing as performance art”*

Andrew Brewerton (College Principal)

- *“We’re good at making so we decided to make a School...”*

- *“I have been asked; is this to help funding, to strengthen the applicant pool or is it a vanity project?”*

Andy (Deputy Headteacher)

- *“We have no set methods – try it and see what works is our mantra.”*
- *“We make sure that local children and their parents benefit from social enterprise projects.”*
- *“We aim to perform well against set standards in Maths and English - other subjects are not tested”*
- *“We are interested in the why questions – not so much the what.”*

Barbara Jones (Deputy Principal)

- *“We control the flow of children into the College so as not to be distracted from our main purpose.”*
- *“We had to overcome the resistance of our LEA”*
- *“A letter of support from Nicholas Serota helped our cause.”*
- *“Encouraging children to progress to higher education is our mission.”*

Cassandra Bisco (Link Tutor)

- *“My job is to set up the opportunity and then stand back and let it happen.”*
- *“A key question for me is, should learning always be fun?”*
- *“When diploma and primary children made videos together, reverse mentoring took place.”*

Mike (Design and making teacher)

- *“A friend told me about the school and so I volunteered”*
- *“I said to year 6, here’s some felt and plywood, now make a character”*
- *“Their characters become the subject of creative writing”*
- *“We then constructed a barcode application to access character descriptions”*

PSCA pupils (years 5-8)

- *“We’re making a new kind of school.” – Year 8 pupil in philosophy*
- *“I have learnt how to draw a circuit and now year 8 is showing me how to make it” – Year 5 pupil in science*
- *“I see reflections in broken glass, all of them me” – year 6 pupil in poetry*

Reflections on current cross-sector collaboration:

Harriet Swain (The Guardian, Tuesday 22 March, 2016) reminds us that the government promised to open 500 new schools by 2020 and is urging universities to help. Swain's article illustrates how universities across the UK are connecting with primary schools, with mixed results. This is part of the vision related to the *'Theatre of the Imagination'* PhD project at the Royal College of Art, as is the development of a primary school of the creative arts which has become a reality in Plymouth.

On discovering such a school already exists, having been set up by Plymouth College of Art three years ago, these reflections are an account of a visit to the College and the School in April 2016. Plymouth School of Creative Arts (PSCA) has been steadily growing into its inspiring new building, designed by Feilden Clegg Bradley Studios, a highly regarded and award-winning architectural practice.

The government has pledged to open 500 more free schools and many head teachers are vehemently against privatising schools by the back door, as they see it. Responses to the initiative are influenced by political distrust. Many academics in higher education have experienced their universities being transformed into businesses increasingly engaged in marketing and revenue generating activities. Howard Stevenson, professor of educational leadership and policy studies at the University of Nottingham, suggests universities have long been involved in successful projects in schools to promote widening participation yet many of these initiatives have suffered cutbacks and questions whether sponsored schools become a distraction from a university's core purpose.

Deputy Principal of Plymouth College of Art, Barbara Jones, was adamant that such a concern would be properly managed. David Eastwood, vice chancellor of Birmingham University, agrees that setting up a free school is not easy – demanding considerable resources, a dedicated project team and careful consideration of how it will fit into the broader ecosystem of its locality. Despite many reservations, Principal Andrew Brewerton believes that if instead of 35 faith groups setting up free schools, 35 art schools had followed the Plymouth model, there would now be a national network of schools pursuing creative education. The task appears to be how to nurture the positive potential of free schools while maintaining fairness and reducing further political intervention.

To help the process operate effectively, PCA have appointed a link tutor, Cassandra Bisco, who organised the collaborative project for level 5 and 6 children at PSCA and students on the Extended Diploma in Creative Media Production PCA. The results from this project were inspiring for children

and students and the following collection of the quotes provide a myriad of insights into how reverse mentoring provides beneficial learning experiences for all participants.

Quotes from participants in Cassandra's film-making project: 'Into the Future'

Jurassic Animal World:

Year 5 participant: *"Then we found an abandoned house in the park and decided that, behind each door, we would walk into a different time periods."*

Diploma student (16-18 years old): *"Ben asked for dinosaurs in the house – I had not done any animation before but now I will do it again."*

Melting Mars:

Diploma student: *"Our film was about an evil dictator who was going to melt Mars. We made the planet Mars from chocolate bars and then used a hairdryer to melt it."*

Year 5 participant: *"It makes me feel happy I got the chance to do it - quite exciting because when we see the film we can say, ooh we made that."*

Year 5 participant: *"We came up with the idea, and drew storyboards, then he (diploma student) helped us make it."*

Diploma student: *"These guys are the directors of our film, we are just making it."*

Animal Defence

Diploma Student: *"We made a film about poachers making money by stealing (sic) endangered animals. Quite embarrassing because you get to see me in a tank top – but then we had a laugh."*

Diploma student: *"I think it's a good idea to get students to work with kids because they can see what creative subjects there are, not just art."*

Planet Disaster

Diploma student: *"From this process I learnt that a child's mind is just as creative as any adult's – and it adds fun and excitement."*

Diploma student: *"The kids' reactions were nice to watch because you sometimes forget what we are doing is for people to enjoy and think about. It is easy to get bogged down in the technology."*

Diploma student: *"The older you get the more you think I should be doing this or I should be doing that – you forget that you should also be having fun. Did you feel that?"*

Diploma student: “Yes, I learnt that from you.”

Year 5 participant: “It should not make sense at all – no one makes sense. Me and Milly-Anne don’t make sense.”

Year 5 Participant: “Yes, people tell me to stop talking and breathe, but I can’t.”

Alienators Dance

Year 5 participant: “I loved making the movies because its my dream to work in the movie industry.”

Diploma student: “I am not used to working with six nine year olds.”

Year five participant: “We are not six.”

Diploma student: “No, six nine year olds.”

Potential impact upon ‘Theatre of the Imagination’

When working with international partners on participatory arts projects it is possible to imagine what a creative school of the future might look like. My doctoral research project, based at the Royal College of Art, sets out to demonstrate how personal agency (Dreier, 2006) can be nurtured, in primary school children and university students, through design and making. The project also aims to connect global communities in order to explore aspects of sustainable development and cultural exchange through constructionism (Papert, 1993).

Ole Dreier (2006, pp.21-38) suggests we are all participants in social practices and can either reproduce or change these social practices. New practices and structures, co-created by participants in the ‘Plymouth Project’, challenges the status quo such that stakeholders ‘ways of being’ begin to shift as described in the field notes of my visit in April 2016. Nurturing responsible citizens who understand their own and others’ cultures through a developing sense of the local and the global is at the heart of constructing an independent view of what constitutes a worthwhile life. Plymouth’s approach encourages ‘the surfacing of prior knowledge’ as a starting point for reflecting upon the world, documenting ideas about how things might be in the future through making films, poetry, food, and simple machines made from found and ephemeral materials.

Findings from case studies and previous research suggest that the approach at Plymouth will have an impact upon *the school of the future*. The *Colours of India* project (Sen, 2009) with IIT Mumbai and the *Escuela de Arte* project (Pulley, 2011) with the Xilitla Foundation in Mexico exhibited outcomes which relate directly to those emerging from the cross-generational participatory arts projects at Plymouth School of the Creative Arts. The aim of the research is to test and evaluate, in a cyclical

way, examples of projects that may be adopted by schools around the world to help students question and develop a deeper understanding of the United Nations Global Goals for sustainable development.

Transition Design (Tonkinwise, Irwin, Kossoff, 2014) helps to develop project-based learning (PBL) workshops that encourage the integration of design, making and philosophy. In particular, a philosophy that supports responsible stewardship and informs a new vision based upon conserving and protecting our planet in the epoch of the Anthropocene . An ambition that may be thwarted by hypocrisy and the hyper-object (Morton, 2013) demands a mindset that encourages us to think more about the next generation and the impact of deeply flawed, hegemonic, political policies based upon competition, consumption and greed.

The educational approaches that help to support the aims of transition design are project-based learning through making such as those operating at the Plymouth School of Creative Arts and other forward looking schools around the world, with a particular emphasis upon Finland. Metacognitive leaning strategies, designed to give children the tools to think critically and reflexively while learning to become more independent and to build personal agency. Building confidence in an individual's ability to make a difference leads to the conclusion that the future is something we are making together in a purposeful and thoughtful way.

The United Nations Global Goals for Sustainable Development provide a philosophical framework for cultural exchange through designing and making. Sharing project outcomes, across geographic boundaries, resulting from shared creative journeys reflects the work of Ashley Hall (2014) and Translocated Making. Abductive thinking, following the spirit of Andre Breton's (1925) and the work of Rosan Chow (2010) makes flights of the imagination more accessible, thought provoking and playful. To quote a year 5 pupil at Plymouth School of the Creative Arts: *"It should not make sense at all – no one makes sense. Me and Milly-Anne don't make sense."* And her insight is made more profound by her friend's reason why the project such a success: *"I loved making the movies because it's my dream to work in the movie industry."*

Handmade books of participant's thoughts and reflections, such as those made during the *Escuela de Arte* project, may help the researcher reflect upon what has been learnt and establish qualitative measures to determine the aims being met, or missed, through participatory action research. Combining poetry translated into a second language with moving toys and film making helps to create a fertile climate for global exchange and the development of personal agency may help primary school pupils to consider what, for them, constitutes a worthwhile life.

A Translocated Making Project between PSCA and Medano Primary School, Tenerife

Tenemos su Basura en nos Playa (we have your rubbish on our beach)

Raising awareness of how people live in a distant coastal settlement may also raise levels of empathy and compassion. Our seas and the oceans are connected and the air we breathe is shared with people who live in Europe, Africa, the Americas, Asia, Australasia, the Arctic, and Antarctica. In his book 'Hyperobjects' (2013) Timothy Morton explains:

“The actual Earth, as Thoreau puts it, now contains throughout its circumference a thin layer of radioactive materials, deposited since 1945. The deposition of this layer marks a decisive human terraforming of Earth as such. The first significant marks were laid down in 1784, when carbon from coal-fired industries began to be deposited worldwide, including in the Arctic, thanks to the invention of the steam engine by James Watt.”

The project proposal

To collect materials and objects washed up along the shoreline and to design and make automata that illustrate imaginative stories related to the United Nations Global Goals. The aim is to make the workshop locally based yet globally connected.

Children are invited to speculate upon where materials washed up on the beach have come from and to imagine the history of these things. Archaeologists contemplate the history of an object - meaning why, how and where it was made - and 'our' history of an object – meaning a day in the life of people who came into contact with the object. For example, a leather shoe washed up on Medano Beach in Tenerife may have been handstitched by a Moroccan cobbler, using camel leather, and may have been worn by a local trader who travelled the Sahara as part of a camel train, carrying spices and oils across dunes and over the Atlas Mountains. This may be fanciful but is also a tale worth sharing. Imagining such scenarios and personas may help to develop new cultural insights and to nurture an independent view of the world and its people.

The task for participants would be to make drawings and moving models that illustrate a scene from their stories and perhaps a sequence of connected scenes in collaboration with peers. The wind that sweeps the beach could be harnessed to animate the automata. And participants are invited to create stories from what they 'see' in the material they find, like the pictures that emerge from clouds or from embers in a camp fire.

The aim is to stimulate the imaginations and memories of children and adults who then create short stories, drawings on paper, wire models, and things using these found objects. The aim is to find out if working in this way nurtures skills, builds confidence and makes a difference to the way in which we think and learn. Making a difference in this context means connecting design, technology and philosophy related to sustainable stewardship and compassion.

One way in which responsible stewardship has been introduced to primary school pupils is through the United Nations Global Goals. Children are introduced to case studies related to social equity, renewable energy and global warming. The intention of Theatre of the Imagination is to produce a five-minute video and lesson plan to help introduce the UN Global Goals in English, Spanish and Mandarin. This means keeping the word count low and developing a simple glossary of terms.

Developing design and making events within a ‘Learning Circle’ which includes teachers, students and the researcher is an important way of evaluating and improving workshops prior to piloting each project with primary children and university students.

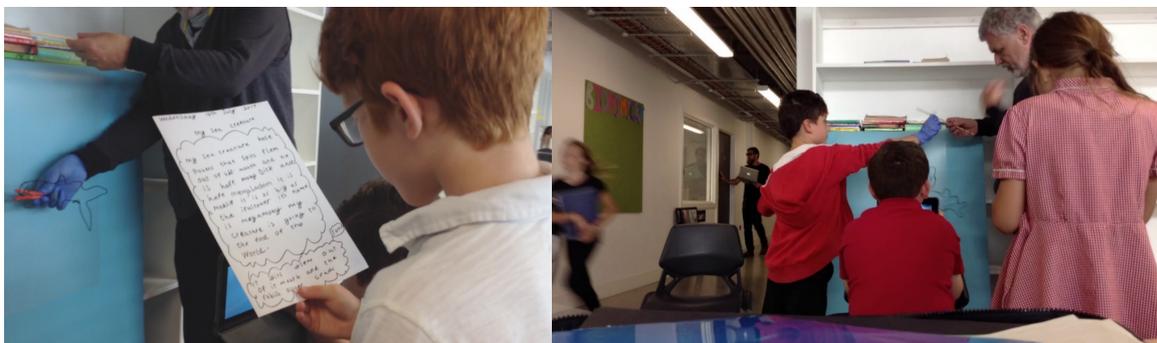


Figure A6.2: Participants making videos for ‘Life Below Water’

Appendix seven: Ethical approach and guideline

Code of ethical practice:

The following code of ethics is based upon work undertaken by the United Nations Children's Fund. All participants in the Royal College of Art 'Safety near and on Water' workshop including: students, educators, researchers, and administrators, are required to sign up to support the principles and declarations outlined in this document.

Philosophy

Respect for the dignity, well-being and rights of all children, irrespective of context, is central to the philosophy that underpins the collaborative work. Such respect is integral to teachers' and researchers' decisions and actions concerning the nature and conditions of children's involvement in any of the workshop activities.

Our pledge

As an education and research community, when working with children, we are committed to undertaking and supporting high quality, ethical teaching and research that is respectful of children's human dignity, rights and well-being.

Responsibility

We, the education and research community, including all who participate in undertaking, commissioning, funding and reviewing the research and education related to design and making workshops concerning 'Safety Near and On Water, are responsible for ensuring that the highest ethical standards are met in all research involving all participants.

Respect

Ethical teaching and research is conducted with integrity and is respectful of children, their views and their cultures. Involving children respectfully requires that students, educators and researchers recognise children's status and evolving capacities and value their diverse contributions.

Equitability

Children involved in learning and research are entitled to justice. This requires that all children are treated equally, the benefits and burdens of participating are distributed fairly, students and children are not unfairly excluded and that barriers to involvement based on discrimination are challenged.

Benefits

Postgraduate students, teachers and researchers must ensure that the workshops maximise benefits to students and children, individually and as a social group. The postgraduate students, educators and researchers bear primary responsibility for considering whether the education and research should be undertaken and for assessing whether the workshops will benefit children, during, and as a consequence of, the research and pedagogic process.

Risk

Postgraduate students, teachers and researchers must work to prevent any potential risks of harm and assess whether the need to involve the individual child is justified. All students, educators and students have accepted their position on the basis of their academic qualifications and research interests, and each individual maintains sound mental health and social prudence necessary to perform their duties. All researchers and educators comply with applicable laws and regulations related to this code of ethics.

Consent

Children's consent must always be sought, alongside parental consent and any other requirements that are necessary for the research to proceed ethically. Consent needs to be based on a balanced and fair understanding of what is involved throughout and after the research process. Indications of children's dissent or withdrawal must always be respected.

Reflection

Ethical research and teaching demands that students, teachers and researchers continually reflect on their practice, well beyond any formal ethical review requirements. This demands ongoing attention to the assumptions, values, beliefs and practices that influence the education and research process.

Conduct toward Children

Students, educators and researchers accept personal responsibility for teaching children character qualities that will help them evaluate the consequences of and accept the responsibility for their actions and choices. We believe all educators and researchers are obligated to help foster civic virtues such as integrity, diligence, responsibility, cooperation, loyalty, fidelity, and respect-for the law, for human life, and for self.

Conduct toward Practices and Performance

All of our postgraduate students, teachers and researchers assume responsibility and accountability for their performance and continually strive to demonstrate competence. Educators and researchers endeavour to maintain the dignity of their profession by respecting and obeying the law, and by demonstrating personal integrity. No administrator, student, teacher or researcher will misrepresent this code of conduct.

Conduct toward Colleagues

Researchers and educators, in exemplifying ethical relations with colleagues, accord just and equitable treatment to the whole team. Researchers and teachers do not reveal confidential information concerning colleagues unless required by law. No member of the team will interfere with a colleague's freedom of choice, and every member of the team will work to eliminate coercion that may force a colleague to support actions and ideologies that violate his or her professional integrity.

Conduct toward Parents and Community

Each team member of the 'Safety Near and On Water' workshop recognises that quality education is the common goal and that a cooperative effort is essential among the team to attain that goal. Each team member will make a concerted effort to communicate to parents any information that should be revealed in the interest of the children. Postgraduate students, educators and researchers endeavour to understand and respect the values and traditions of the diverse cultures represented in our community of participants.

October 2016

Dear Parents and Guardians

Visiting students and researchers from the Royal College of Art will be working with the Floating Classroom and Edward Wilson Primary School on a project related to designing and making artefacts, drawings and digital animations. The project will focus upon learning through making and sets out to help develop our understanding of safety on or near water.

I am writing to you as we are seeking permission to take photographs and video footage of your child (or child's name?) who may be selected to take part in a workshop over the coming weeks. Photographs and video footage will be used to help analyse the workshop and may subsequently be selected to appear in digital and printed form in journal articles, website promotional material, and an exhibition in collaboration with the Lloyds Register Foundation.

The School may wish to use these images in its prospectus or in other printed publications that it may produce from time to time, as well as on the website. We may also use the recordings for school-to-school conferences, monitoring or other educational use.

Photography or filming will only take place with the permission of the Head Teacher and under appropriate supervision. Before we undertake the project, we need your permission to photograph and make any recordings of your child. Please answer the questions below, sign and date the form and return the completed form to the school.

Please circle your answers

May the students and researchers use images and video footage of your child in

Journal articles, related websites and an exhibition? **Yes / No**

May we use your child's photograph in the school Prospectus, and related publications, produced for promotional purposes? **Yes / No**

May we use your child's image on our website? **Yes / No**

May we record your child's image on video? **Yes / No**

Please note that websites can be viewed throughout the world and not just in the United Kingdom where UK law applies. Please note that the conditions for use of photographs are on the back of this form.

I have read and understood the conditions of use on the back of this form.

Parent's or guardian's signature: _____

Date: _____

Name (capitals): _____

Yours sincerely,

Diamond Nee

Conditions of use

This form is valid for five years and the consent will automatically expire after this time.

We will not use the personal details or full names (which means first name and surname) of any child or adult in a photographic image on video in any aspect of the research project, our school prospectus or in any of our other printed publications.

We will not include personal e-mail or postal addresses, or telephone or fax numbers on video, in any aspect of the research project, on our website, in our school prospectus or in other printed publications.

If we use photographs of individual pupils, we will not use the name of that child in the accompanying text or photo caption. All of our children's names and personal details will remain anonymous.

We may include pictures of pupils and teachers that have been drawn by the pupils and we may use group or class photographs or footage with very general labels, such as 'a design and making lesson' or 'making a digital animation'.

Email in support of approach to ethical protocol and consent: 18th October 2016

Appendix eight: examples of drawing theory

Figure A8.1: Ways of fostering creativity in primary education

Figure A8.2: Magical sea creatures

Figure A8.3: Data analysis

Figure A8.4: Factors of agency

Figure A8.5: Knowledge emerging from creative workshops

Figure A8.6: Student evaluation of 'Life on Land' workshop

Figure A8.7: Participatory action research

Figure A8.8: 'Make Your Move' workshop evaluation

Figure A8.9: Visual analysis of 'Life Under Water'

Figure A8.10: Reggio Emilia

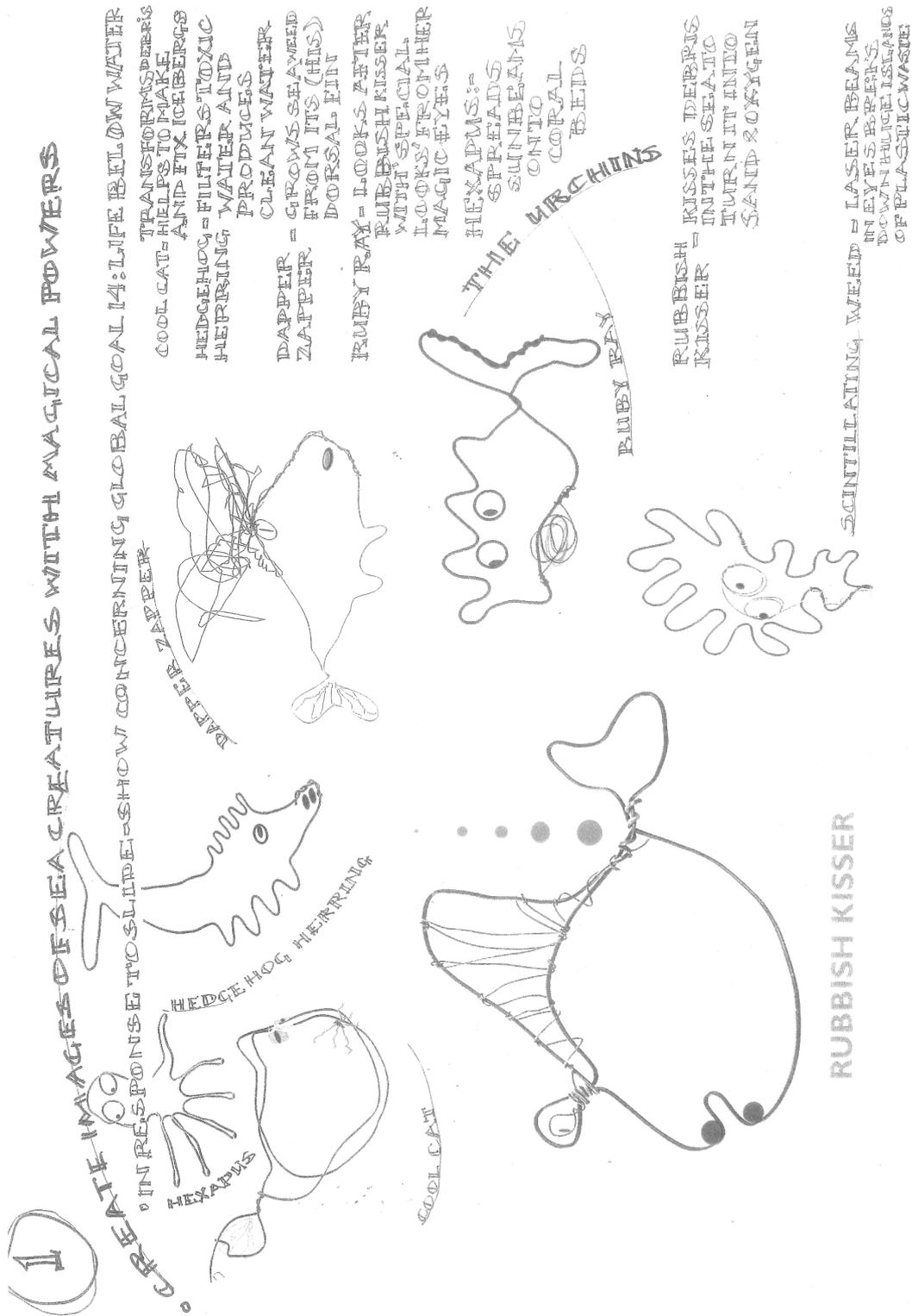


Figure A8.2: Magical sea creatures (Pulley©, 2018)

4 A DISCUSSION OF HOW YOU ARE GOING TO APPROACH ANALYSING THE DATA/FINDINGS
- YOUR DATA ANALYSIS

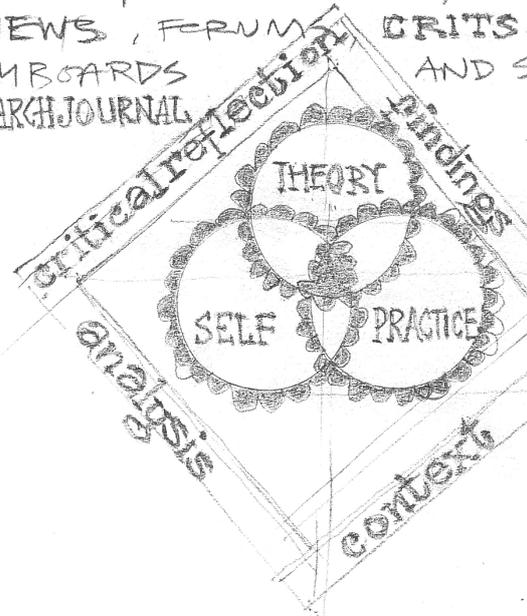
RESEARCH

METHODS TO BE APPLIED:

- SURVEYS, QUESTIONNAIRES, INTERVIEWS
- OBSERVATIONS, PHOTOGRAPHY
- DESIGN PROJECTS AND WORKSHOPS
- TESTING, PROTOTYPES, TEST RIGS, MODELS
- REVIEWS, FORUMS, CRITS
- STORYBOARDS AND SHORT FILMS
- RESEARCH JOURNAL



STUDENT AND TUTOR F/BACK



DATA ANALYSIS

FROM COLLINS, H. (2010)
"THE THEORY AND PRACTICE OF RESEARCH FOR THE CREATIVE INDUSTRIES" AVA PUBLISHING

WHEN REFLECTING...

- "THE MAIN THING I WANTED TO SAY ABOUT THIS RESPONDENT."
- "THE REALLY INTERESTING THING ABOUT THIS..."
- "ONE WAY OF WORKING AT THIS DATA IS... BECAUSE IN MY LITERATURE REVIEW..."

(DAVID SIMMONS) 2012

LONDON, SAGE

CODING IS NOT A PRECISE SCIENCE; IT'S PRIMARILY AN INTERPRETIVE ACT

saldana, j (2009) THE CODING MANUAL FOR QUALITATIVE RESEARCHERS

"A CODE IN QUALITATIVE INQUIRY IS MOST OFTEN A SHORT PHRASE THAT SYMBOLICALLY ASSIGNS A SUMMATIVE, SALIENT, ESSENCE-CAPTURING, AND/OR EVOCATIVE ATTRIBUTE FOR A PORTION OF LANGUAGE-BASED OR VISUAL DATA."

DESCRIPTIVE CODE: A ONE-WORD CODE WHICH SUMMARISES THE PRIMARY TOPIC!

EG: DESIGN; EDUCATION; ENTERPRISE; SUSTAINABILITY; RESEARCH

IN VIVO CODE: WHAT THE PARTICIPANT SAYS, PLACED IN QUOTATION MARKS.

EG: "GLOBALISATION"; "DEVELOPMENT"; "CAPITALISM"; "HUMAN DEVELOPMENT"

PROCESS CODE: A WORD OR PHRASE THAT CAPTURES ACTION.

EG: DESIGNING; MAKING; TEACHING; COLLABORATING; REVIEWING

CODING AS A HEURISTIC

THE MAJORITY OF RESEARCHERS CODE DATA DURING AND AFTER COLLECTION.

SOME BELIEVE CODING AND ANALYSIS ARE NOT SYNONYMOUS THOUGH

MOST SEEM TO BELIEVE CODING IS CRUCIAL TO ANALYSIS (EASIT, 2003 P145)

"CODING" LEADS YOU FROM THE DATA TO THE IDEA (EVANS, 2007 P27)

Figure A8.3: Data analysis (Pulley©, 2018)

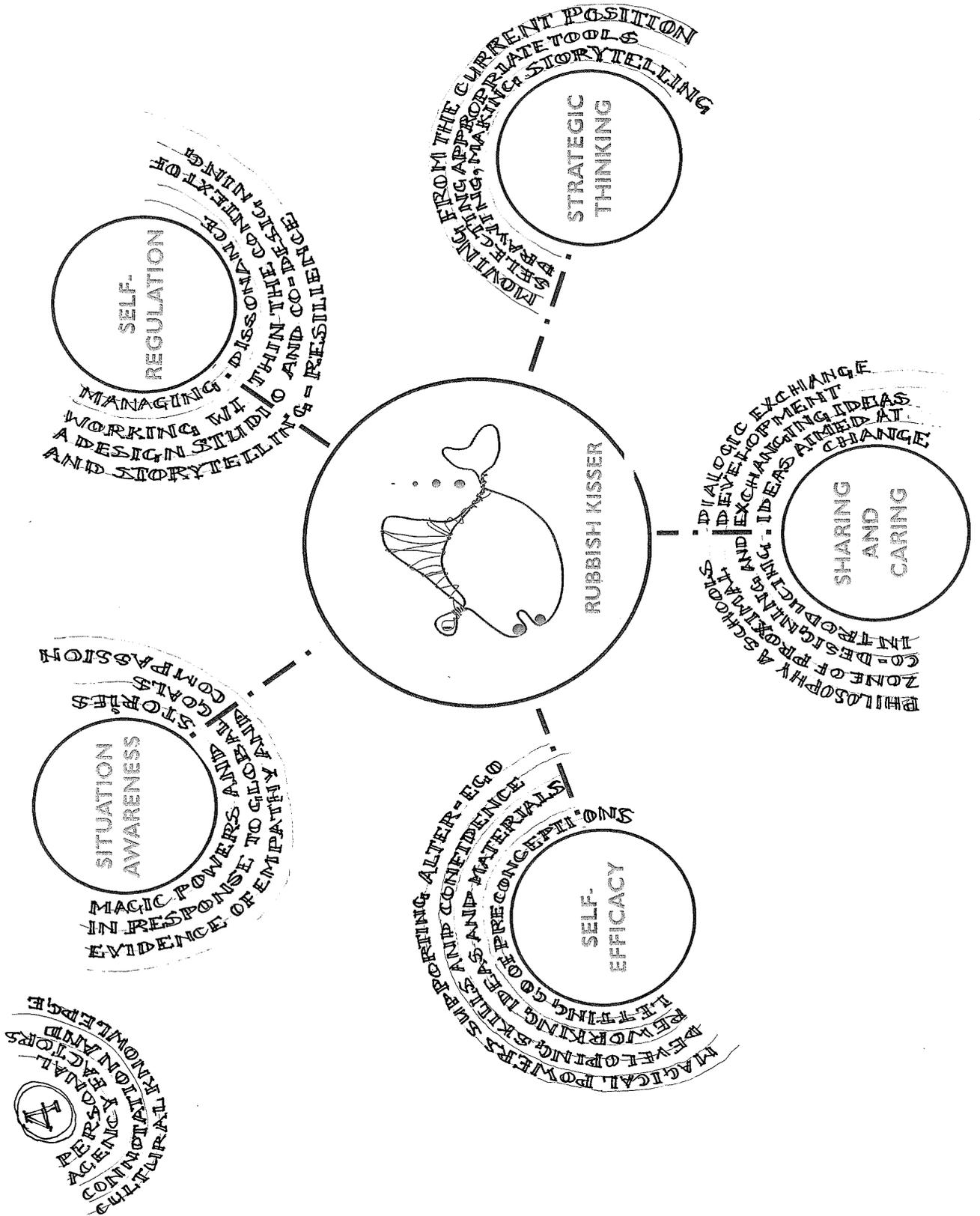


Figure A8.4: Factors of agency (Pulley©, 2018)

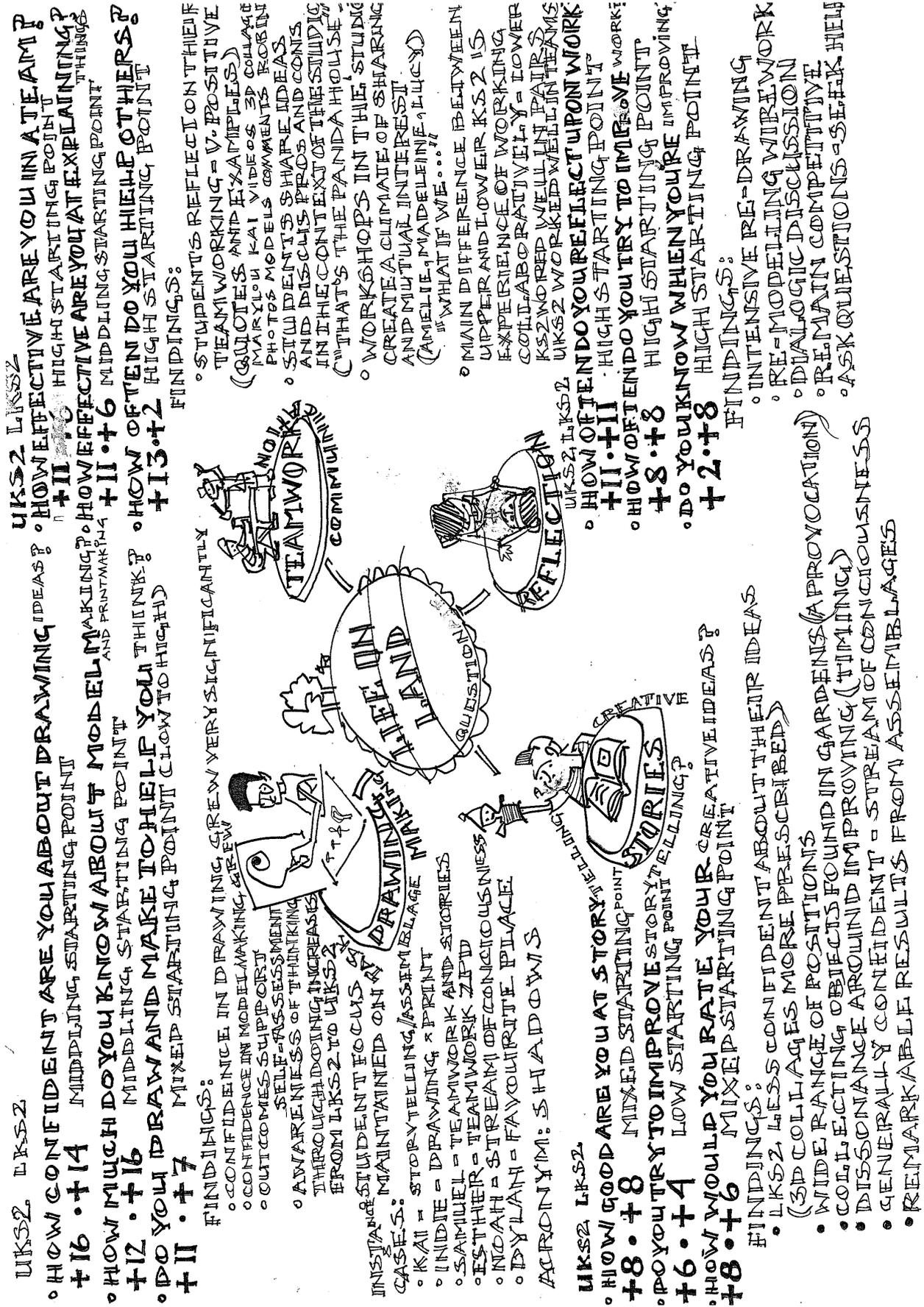


Figure A8.6: Student evaluation of 'Life on Land' workshop (Pulley©, 2018)

ORLANDO FAIS BORDA ON PARTICIPATORY ACTION

RESEARCH

... IT SEEMED COUNTERPRODUCTIVE

FOR OUR WORK TO REGARD THE

RESEARCHERS AND RESEARCHERS,

THE TARGETS AND THE EXPERTS

AS TWO DISCRETE, DISCORDANT

OR ANTAGONISTIC POLES. RATHER,

WE HAD TO CONSIDER THEM BOTH

AS REAL THINKING FEELING PERSONS

WHOSE DIVERSE VIEWS ON THE SHARED

LIFE EXPERIENCE SHOULD BE TAKEN

JOINTLY INTO ACCOUNT... LOOKING

FOR SYMMETRIC RECIPROCALITY... FOR

MUTUAL RESPECT AND APPRECIATION

AMONG PARTICIPANTS, AND ALSO

BETWEEN HUMANS AND NATURE,

IN ORDER TO ARRIVE AT A SUBJECT-SUBJECT

HORIZONTAL RELATIONSHIP

IN: THE HANDBOOK OF ACTION RESEARCH (2011)

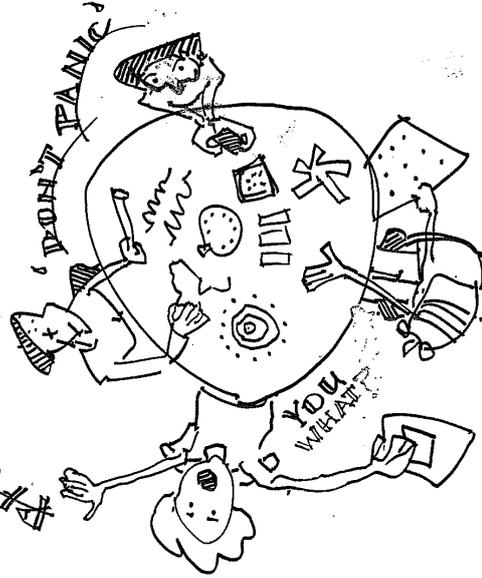
CHAPTER 2, P. 30

EDS. PETER REASON AND HILARY BRADBURY

LONDON: SAGE

FRUITFUL LABORATORY DESIGN

'DON'T PANIC',
'GOING ABIT PETE TONG',
'YOU WHAT'



ERICO MANZINI'S BOOK, 'DESIGN, WHEN DESIGNS'

APPLIES PARTICIPATORY DESIGN

TO SOCIAL INNOVATION THROUGH

A COMBINATION OF 'DIFFUSE DESIGN',

'EXPERT DESIGN' AND 'CO-DESIGN',

TO SUPPORT SOCIAL CHANGE THROUGH

EMERGING FORMS OF COLLABORATION

EVERYBODY 2015

Figure A8.7: Participatory action research (Pulley©, 2018)

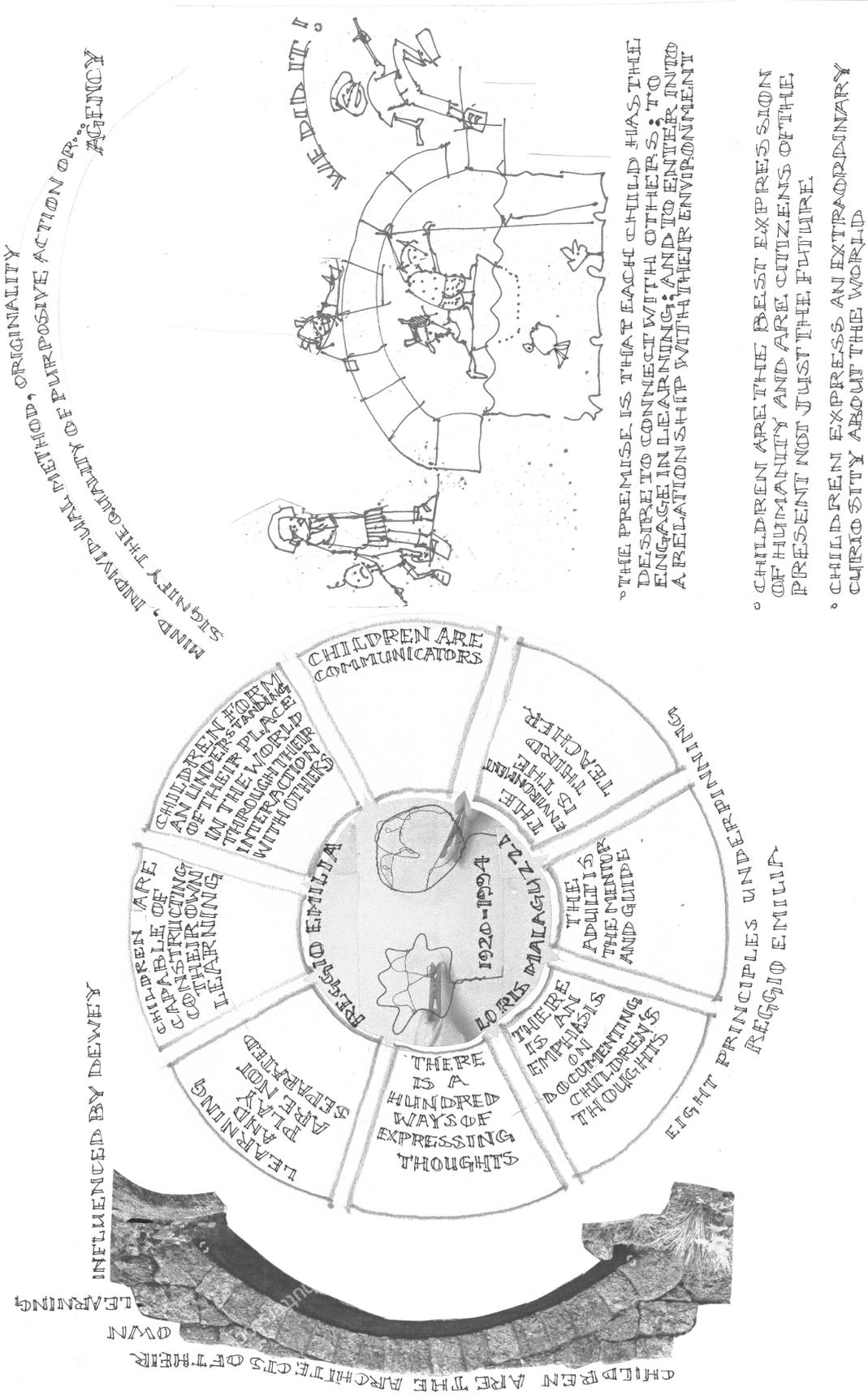


Figure A8.10: Reggio Emilia (Pulley©, 2018)

Appendix nine: UN Global Goals

 **SUSTAINABLE DEVELOPMENT GOALS**

1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION 
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION 
13 CLIMATE ACTION 	14 LIFE BELOW WATER 	15 LIFE ON LAND 	16 PEACE, JUSTICE AND STRONG INSTITUTIONS 	17 PARTNERSHIPS FOR THE GOALS 	

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