It Takes a Village:  
A SchemaPlay Evaluation of KidZania  

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A report commissioned by KidZania, London, September 2017
Summary

The following report provides a preliminary evaluation and analysis of KidZania and its contribution to meeting the current educational priorities for 4 and 5-year old children. It is argued that the KidZania project is particularly relevant in the context of narrowing the current gap in early literacy achievement for children. Research evidence is presented that suggests that this is a problem most apparent in the underachievement of disadvantaged young boys. It is also suggested that KidZania has the potential to support efforts to address the issue of the underrepresentation of girls in Science, Technology, Engineering and Mathematics.

A study was carried out in London to provide an analysis of the KidZania experience, applying an early childhood education and development model informed by new developments in neuroscience, embodied cognition and Cultural Historical Activity Theory (CHAT).

This report argues that a KidZania outreach programme, focused upon supporting emergent literacy through early childhood Science, Technology, Engineering and Mathematics (STEM) activities, has the potential to draw upon boys’ strong motivations in this subject area, creating meaningful purposes for their engagements with text. The promotion of STEM activities in early childhood would also offer the possibility of raising the aspirations of young girls towards these areas of the curriculum. The study reports on the piloting of a research methodology originally developed by Kelly (1995) for the purposes of identifying individual cognitive constructs, and it is suggested that this methodology be adapted in the evaluation of an intervention study focused on the provision of outreach support to early childhood educators in achieving our common aims in improving social mobility. The report concludes with an outline proposal for this project.

Basil Bernstein famously wrote that ‘Education cannot compensate for society’. That may be true, but we can educate our children in a society that is more empowering than our own. To do this we must work together and create learning environments where children are safe from the prejudices and depressed expectations of adult society, as the African aphorism has it: It takes a village to raise a child. KidZania is a good start.

Introduction

KidZania, London is currently the United Kingdom’s first educational entertainment centre where children aged 4 to 14 can experience the world of work through role-play. The 75,000 sq. ft. child-sized city offers exploration of real life professions and it aims to provide an experiential approach to support children’s wider learning right across the curriculum. Ger Graus (Global Director of Education, KidZania) sums up; “the KidZania project has also been developed to explicitly recognise that children as young as four years of age need to have positive and supportive experience of life opportunities; that they need to be aware of the occupational possibilities that are open to them.” KidZania’s aim is to broaden children’s horizons, enabling them to; “explore, aspire, and begin to write their own narrative of the possible”. KidZania’s philosophy and practice is explicitly related to Harvard University’s ‘Visible Thinking; Project Zero’8, and Reggio Emilia: “KidZania’s learning by its very nature aims to be self-initiated, self-directed and self-sustained: children cause the learning to begin, manage and govern their own learning, and finally maintain their interest in what is learned and the learning itself”.

Early Childhood Educational Priorities and Possibilities

Both internationally, and more locally, the educational priorities identified in the UN Sustainable Development Goals (SDGs) which set out global targets to be achieved by 2030, may be considered the most pressing priorities. SDG Goal 4 is to ‘Ensure inclusive and quality education for all, and to promote lifelong learning’. The specific targets for SDG 4 include ensuring universal access to high quality early childhood education; provisions for achieving improvements in literacy and numeracy education; equal access to education and technical and vocational training for women at every level. SDG Goal 5 is also to ‘Achieve gender equality and empower all women and girls’, and the first target is a bold one, to ‘End all forms of discrimination against women and girls everywhere’.

Underachievement in basic Literacy and Numeracy

It has been estimated that 200 million children under 5 years old living in low- and middle-income countries fail to reach their developmental potential (Grantham-McGregor, et al, 2007; Sherr, et al, 2009; Walker et al, 2011). The huge loss of human potential that this represents is also apparent in the relatively prosperous nations of the world. In the UK, the Longitudinal Study of Young People in Education (LSYPE, 2013) found that working-class children struggle to see the significance of schooling to achieving their aspirations and, in many UK regions, especially in the North, they have limited knowledge and awareness of their life possibilities; including sustainable, occupational and entrepreneurial occupations (Parliamentary, 2014).

In terms of literacy, research has shown that for children growing up in relative poverty (receiving free school meals; ‘FSM’), both boys and girls are falling behind by almost twice the national average and this achievement gap exists across all social groups and ethnicities. Young boys are especially underachieving in the UK, and this gender gap is also well documented (Lingfield, 2017; Save the Children, 2016, Moss & Washbrook, 2016). Statistics show that the gender gap is even greater between boys and girls receiving FSM. Unfortunately, the changes put in place over the past decade to support five-year olds in this respect have had very little impact. Girls outperform boys in reading and the achievement gap has remained stable from early years to GCSE over the last ten years. The evidence also shows that the foundations of the boys underachievement are set in early childhood with significant gap in attainment between girls and boys already apparent at age 5.

Falling behind in language and communication at the age of 5, has a profound impact on children’s development in primary school, and it is also a large contributing factor to children’s attainment throughout education. The longer-term impact is that falling behind in communication and literacy during the early years damages children’s life chances, impacts earnings in later life, literacy skills, mental health as adults, as well as their own children’s life chances (Save the Children, 2016).

A study carried out by the University of Bristol, ‘The Gender Gap in Language and Literacy Development’ (Moss & Washbrook, 2016) found, in applying their model, that addressing the gender gap in the UK Early Years Foundation Stage (EYFS) could potentially have meant that around 10,000 extra boys would have met the expected standard of reading at Key Stage 2 in 2012 alone. Moss & Washbrook (2016) identify that:

- Boys are less likely to engage in activities in their early years that support language and literacy at home and at school.
- Boys are less likely to acquire the characteristics that will help them learn to read and write, with resultant deficits in characteristics such as motivation, self-regulation, confidence and engagement.
In considering how to address and rectify the gap, Moss & Washbrook (2016) note that there are a variety actions that need to be taken; including:

- Improving the depth of learning opportunities and the amount of interaction between adults and children to support and encourage early reading and learning-related skills.
- Ensuring that both boys and girls participate equally in early reading and play-related activities to develop their skills and keep them interested in books, reading, talking and learning.
- Encouraging boys and girls to share their interests in literacy related activities, and helping them to build this into their play, which is key for supporting motivation.

Lord Lingfield speaking in the House of Lords (Hansard Parliament, 2017) suggested that the gap might also be alleviated if there were more male teachers in schools, as they would be able to understand what makes boys ‘tick’, suggesting that male role-models could be helpful and further suggesting that education has not been focussed sufficiently upon the particular interests of boys.

We know from the highly influential longitudinal research project; ‘The Effective Provision of Pre-school Education [EPPE] (Sylva, et al, 2010), that parents and carers are the most important influences on children, followed by children’s neighbourhoods, identified as moulding children’s ambitions (Parliamentary, 2014; Putman, 1995). There are said to be various community characteristics associated with low aspirations. These include a history of economic decline, a lack of broad opportunities, small and closed social networks, where there are high levels of bonding social capital and low levels of bridging social capital and a ‘weak social glue’ (Putnam, 1995).

Around the world evidence has been collected in a variety of longitudinal studies (Cunha & Heckman, 2006; Barnet & Belfied, 2006; Boreman & Hewes, 2002) which show the strong economic benefits of investing in children’s developing skills and experiences in the early years. It is widely recognised that children’s aspirations, their self-esteem and self-efficacy are contributing factors affecting school learning outcomes and future occupational outcomes (Gutman & Akerman, 2008; Schoon & Parsons, 2002; Gottfredson, 2002).

**The underrepresentation of Women in Science, Technology, Engineering and Mathematics**

It is becoming increasingly difficult to find workers skilled in science, technology, engineering and maths, and the need to invest in order to ensure a pipeline of skilled STEM competencies has become a great concern; a concern in terms of workforce issues, economic-development and as a business imperative (Klein, 2014; Boswell et al, 2013). 64% of engineering employers say a shortage of engineers in the UK is a threat to their business and it has been estimated that enabling women to meet their full potential in such work could add as much as $28 trillion to annual GDP by 2025 (Woetzel, et al 2015).

Significantly a study by Miller & Hayward (2006) surveyed 508 UK students aged 14-18 for their perceptions regarding 23 occupations. Both girls and boys preferred jobs that they saw as stereotypically gender-appropriate and dominated by their own sex. Between 2001 and 2011 the number of technology jobs held by women in the UK actually declined from 22% to 17%. In terms of the total number of technology and science degrees awarded to women there has been a decline from 37% in 1985 to just 18% in 2008 and, in computing, the decline in Computing A-Levels taken by women fell from 12% in 2004 to just 8% in 2011. The UK has the lowest percentage of female engineering professionals in Europe, at less than 10%, while Latvia, Bulgaria and Cyprus lead with nearly 30%.

It has been shown (Archer, et al., 2010) that subtle differences within classroom cultures can profoundly shape the extent to which some pupils (e.g. girls, minority ethnic pupils) feel that they
are able to ‘identify’ with science (e.g. to see themselves as a ‘science person’). Official statistics show uneven patterns of science participation across social groups. Women and those from working-class and/or certain minority ethnic backgrounds are severely under-represented. Children with science aspirations are disproportionately likely to come from middle-class and White or South Asian backgrounds (Archer et al, 2003; 2010).

While it has previously been considered that if a subject was ‘fun’ it was likely to attract more pupils, recent research carried out by ASPIRES (2016) has found that participation in science at higher levels is not just about making it ‘fun’, because even when students at the age of ten say that they enjoy science, they are still deciding that it is “not for them”. Young people’s aspirations are strongly influenced by their social backgrounds and the gap in children choosing STEM subjects appears to be due to a lack of perception of how STEM supports a variety of careers:

- “Currently careers in and from science are not commonly perceived as ‘for all’, which discourages many children from developing science aspirations.” (ASPIRES, 2016, p.2)
- “If I do science I will have to be a scientist!” (Findings from ASPIRES, 2016, p.2)

Similarly, in the context of Information and Communications Technology (ICT) where there is also a serious underrepresentation of women and girls, the problem has often, in the past, been presented in terms of; ‘how can we provide a more accessible and motivating approach to ICT for girls’. In 2014, girls accounted for only 18% of all students in Computer studies/IT related HE courses. The introduction into UK schools of ‘Computing’ as a replacement subject from ICT, has provided a means of getting further away from the outdated mechanical views of technology that were popular in the past, and to potentially offer a more cerebral and girl-friendly subject. Research carried out by the Office for Communication (OFCOM, 2013) found that between the ages of 5 and 7, less than half the number of girls compared with boys played computer or video games, although they were twice as likely to use the Internet. Apparently, this gap continues and grows wider into the teenage years.

It seems that generally speaking, when it comes to ICT use, boys like computer games, and girls like to use ICT to communicate. Siraj-Blatchford and Whitebread (2003) refer to early childhood research carried out to identify so called ‘pink software’ games that would appeal more to girls. However, some of the research suggests that even those girls who do play computer games tend to grow out of them, even if boys don’t tend to (OFCOM, 2013). Computer games are also a very small sector within the overall IT industry and the association of their early use with children’s developing interest in the underlying technology has never been demonstrated.

One of the strongest predictors of girls’ interest in STEM subjects is the extent to which they can see value and relevance in computing (Denner, 2011), but it seems that girls often know very little about these jobs and they have significant misconceptions. Carter (2006) surveyed 836 students and found that the top reason girls chose to study Computer Science was due to their desire to use Computer Science in another field. It is therefore important to ensure educational provisions show how computing can be used in a variety of fields to solve a wide variety of problems. Girls should also learn that these jobs are often well-paying and plentiful (Ashcraft et al., 2012, p41).

The skills required for STEM subject competence include, curiosity, creativity, collaboration and critical thinking. These are attitudes and skills which are supported in the early years curriculum (DfE, 2014), but application of these skills to meaningful contexts may currently be limited. Science careers can provide a path to social mobility and, although this is recognised by some social groups, there is evidence that many parents and pupils do not see science as accessible and “open to all” (ASPIRES, 2016).
Evidence suggests that qualifications in science, technology and mathematics can be highly transferable in the job market, with demand set to increase (CBI/EDI (2010); but many young people and families are unaware of this.

**How do we raise expectation and influence occupational aspirations?**

Career decision making is a life-long learning process and there is a consensus that it begins at an early age. Hoffner et al, 2006 and Ginzberg et al, 1951 were among the first to develop a theory of occupational aspiration. They identified an influential ‘fantasy’ period in early childhood; “During the fantasy period, play gradually becomes work orientated and reflects initial preferences for certain kinds of activities” (Zunker, 1990, p23). Sociodramatic fantasy play, where children play out the roles of the adult world in ‘home corners’ and improvised workplace environments has been thoroughly researched over the years and it is widely recognised as playing an important part in early childhood education. Research associates it with a wide range of positive learning outcomes; including the development of early communication and collaboration (Meckley, 1994) skills, literacy (Vedeler, 1997; Christie and Stone, 1999) and self-regulation (Smilansky,1990). As Trice and Greer (2016) put it: “Children participate in goal-directed action and in doing so begin to meaningfully perform their own life stories.”

Socio-dramatic fantasy play is also widely encouraged in early childhood settings. It is seen as a characteristic and effective mode of learning activity for this age group (Vygotsky, 1978; Wood & Attfield, 1996, Anning & Edwards, 1999). Unfortunately, there has been a decline in socio-dramatic play which is freely chosen and lasting for hours or even days in the UK. One of the suggested factors preventing children from developing more mature play includes an increase in adult-direct teaching. There is also a perceived lack of time for children’s play to develop. Play is often limited to just a couple of hours each day, and it is often interrupted (Rogers and Evans, 2008).

In considering the subject of occupational aspirations it is useful at first to distinguish between the child’s developing understanding or image of an occupation and the process by which they come to relate to particular occupational images. While Ger Graus’s (2017) aphorism; “You cannot aspire to something you do not know”, may be especially true in early childhood, research suggests that vocational choices are constructed in a process where the alternative choices that we are aware of are gradually eliminated from our consideration (Gottfredson, 1981, p556). From this perspective, the problematic of supporting positive occupational aspirations and encouraging social and cultural mobility becomes much more a matter of developing occupational resilience.

Gottfredson’s (1981 – 2005) classic theory of ‘Circumscription and Compromise’ was developed out of a concern to answer the question, “Why do children seem to recreate the social inequalities of their elders long before they themselves experience any barriers to pursuing their dreams?” (Gottfredson, 2002, p85). The child’s self-concept and her occupational aspirations are actually mutually constituted. Children ultimately aspire to roles that are compatible with the image they have of themselves. Self-concept, in turn, is constituted in the individuals socio-economic, gender and cultural experience in society. Educational achievement or underachievement has a powerful influence in this. As Gottfredson has suggested, self-conceptions and occupational aspirations might usefully be seen to develop in a ‘leap frog’ manner. Individuals value occupations that are compatible with their self-concept, and their aspirations are determined by the sort of person they want to become and the amount of effort they are willing or feel able to spend in realising these objectives (Gottfredson, 1981, p547, p556).

The sex-typing, and the perceived social prestige of an occupation has been found to be an extremely strong influence even at an early age when a child’s perception of the prestige of an
occupation is also heavily conditioned by family role models (Gottfredson, 1981, p550):

“As youngsters become aware of who they are, they concurrently develop notions of who they want to be in the future. They may not actually think much about the future, but they make judgements about what roles and activities are compatible or not compatible with their images of who they are or are trying to become. Occupation is one of the most important and observable differentiators of people in our society, so it is not surprising that even the youngest children use occupational images in their thinking about themselves” (Gottfredson, 1981, p556).

Gottfredson’s situated cognitive account of occupational aspirations emphasises the very powerful early influence of gender expectations and educational achievement, and might be considered to simply offer an account of the child’s adaptation to social realities. In fact, Gottfredson’s account of the influence of genetic endowment is highly contentious and controversial. But such a pessimistic reading would only serve to reify our social and cultural constructions of gender and ability, ignoring the reality that many individuals succeed in pursuing careers outside the stereotypical role boundaries, and against the odds of educational disadvantage and underachievement.

In spite of their minority status, in a recent survey of 300 female engineers, 84% were found to be either happy or extremely happy with their career choice (Atkins, 2013). Engineering students are second only to medical students in securing full-time jobs and earning good salaries (op cit). In a recent review of the literature, Trice and Greer (2016) speculate about future theoretical developments, given recent stress on the rapidly changing nature of the work-place. Their conclusions regarding the relevance of the grand theories of occupational aspiration is balanced:

“...the mechanisms imitation, identification, fantasising, compromising, crystallising, conscripting – still seem to describe what children are doing when they think about the future and their place in it. All of these mechanisms can be constructivist processes, all can be understood in today’s contexts as guides down an individual path, rather than a universal high-way; and all can be pushed out into later ages by the necessity of a more rapidly changing workforce” (p21).

As previously noted, Ginzberg and Gottfredson found that in the early years, children “…go through a fantasy period in which their career choices are based solely on their interests and desires, with minimal attention paid to their abilities or selectivity of the career” (Auger et al 2005, p322). In the circumstances, the challenge is to simultaneously widen the child’s awareness of the career opportunities that they may be faced with in the future, and to provide them with resilience to overcome the social and cultural barriers through strengthening their academic self-esteem, undermining gender stereotypes, and encouraging the highest possible expectations. While Dweck (1991) has identified the process by which children’s experiences of success and failure contribute towards them achieving masterful or helpless dispositions to learning, in the context of occupational aspirations the extant research seems to point towards the child’s achievement (sic) of a ‘learned hopelessness’ whereby particular career options come to appear to the child unthinkable.

Recent empirical studies of children achieving against the odds of disadvantage (Siraj-Blatchford et al, 2007, and Siraj and Mayo, 2016) show that parents and pre-schools are often successful in ‘innoculating’ individual children against such negative dispositions and, as we shall see in the following discussions, KidZania may have substantial potential in supporting this. Whilst a good deal of literature on child development is focused upon minority groups of children who are at special risk, due to their particular adverse conditions or vulnerability, it is important to note that all children are exposed to risks (Cicchetti & Rogosch, 1996). From this perspective, the development of resilience may be seen as a normative characteristic of child development. As Siraj and Mayo (2016) put it, resilience can be seen to be apparent whenever; “…the cumulative effects of
‘protective’ factors in the child, and in the life and environment in which the child develops, outweigh the negative effects of ‘risk’ factors in that child or in their socio-cultural context.” (p7). If we are to maintain children’s wellbeing, and encourage their development and learning, some optimal balance must be found between the stressors associated with risk, and the ‘protective’ psychosocial resources provided to promote resilience in the face of unhelpful cultural expectations and prejudices, disappointments, adversity, stress, and failure. It is in this light that we may consider popular campaigns concerned to support the development of more resilient children through increasing the controlled risks that children confront in early childhood, e.g. in outdoor play (Sandseter, 2009; Little & Wyver, 2008). What we need to see is a similar approach being taken to promote boys’ literacy and the participation of girls in STEM.

Interventions focused on increasing such ‘protective’ learning, may be developed in the context of KidZania, and/or as a KidZania early childhood outreach programme, to support children’s optimal development and wellbeing. A particular focus on role-play based learning associated specifically with STEM might be considered an effective means of contributing simultaneously towards increasing the relevance of basic literacy and numeracy for boys in early childhood, and in contributing to girls’ aspirations in subject areas where they are currently extremely under-represented.

How KidZania Works

The first question to be answered in our consideration of the KidZania experience is to do with the work roles themselves: What does it mean to learn how to be an airline pilot, a scientist, police officer, firefighter, or veterinary surgeon? For a very young child work roles will, at first, be recognised as a figurative image; they will recognise a particular costume that they associate with a particular word. For example, for a scientist, it might be a white coat, or for a police officer, a dark blue uniform (we have a particularly distinctive and attractive uniform in the UK). They are all culturally specific and the words used to name them are different according to the language.

Firefighter
Bombero
Pompier
Ahli bomba
Feuerwehrmann
Xiāofáng duìyuán
M mzima moto
Sôbô-shi
Pozharnyy

In the language of developmental psychology, these naming words and/or images are held in the mind as ‘Schema’, but on their own they carry no knowledge of the role, the functions or affordances, of a person wearing such a costume. As Eleanor Gibson (1979) showed with her experiments with human babies (and a variety of animals), using a ‘visual cliff’, the child’s perception of the world builds up as they interact with it; as they adapt to the physical, social and cultural reality that they inhabit. An experience that may be considered a pre-requisite for understanding the role of firefighter will be that of ‘fire’. At first it may be loosely associated but at some stage the child will learn that a firefighter’s role is to ‘put out fires’. Piaget (1969) distinguished this knowledge of an
operation or action from the figurative image that the child also holds in their mind, by calling it a ‘scheme’. The process of learning about the role of firefighter then continues through the progressive connection of more and more schemes to the schemas that they hold. Firefighters ‘operate water pumps’, they ‘climb ladders’, ‘save people from buildings’, ‘wear breathing apparatus’ and they ‘provide advice on the prevention of fires’. Figure 1 illustrates the processes of learning that are involved.

Fig. 1: The progressive elaboration of a schema.

There are many schemes that contribute over time to a competent understanding of a firefighter’s role, or indeed any other work-related role and, unless we have the experience of actually practicing the role ourselves, there will be aspects that we never learn. This draws our attention to the fact that learning is a life-long process, and this is true of every subject in the curriculum. Whilst we may all have a basic understanding of reading and writing, it remains open to discussion what it means to be considered truly literate. Often, it is only those who choose to take up a subject as a career who are recognised as expert. The relationship between occupation and learning is fundamental. As previously argued, from childhood onwards, occupational aspirations have a profound effect upon our learning motivations and developing conception of self.

For the young child then, their concept of the occupational role is at first partial and it builds up over time as connections are made that depend in themselves on the acquisition of pre-requisite understandings; e.g. that pumps are used to move water using pressure, that fires need oxygen in order to burn, can produce toxic fumes and some materials are more flammable than others. What is important about this is to recognise that not all of this learning currently happens in school and that the most productive context for this learning in children is actually through their play. Research in relation to both language (Tizard & Hughes, 1984), and mathematics (Hughes, 1986) has long demonstrated that many young children find the ‘real’ world of the home and community a much more conducive environment for learning than the artificial and, from what is too often from the child’s point of view, ‘meaningless’ tasks of traditional schooling (Coltman et al, 2015). From the example of just the one role of firefighter above, it is clear that formal education would be quite inadequate to the task of providing everything that children learn in their early childhood.
Research carried out by Catherine Snow in the USA has also shown that an average 1 year-old knows about 5 words, at age 2 the average is typically about 150, at the age of 6 the average child knows 14,000 and by adulthood we will typically have more than 40,000. Only a tiny fraction of these will be introduced in a classroom. Even more importantly, we must recognise that many children fail to achieve yet others far exceed these averages. Snow et al (1998) found that the 1 year-olds she studied used between zero and thirty words, with the gap growing even bigger by two-years of age, when the children used between 10 and 450 words. The early years has the greatest influence upon children’s achievement and underachievement. Research has consistently shown that investment in early childhood education is more cost effective than any other investment in education (Grantham-McGregor et al, 2007, Heckman, 2011, Engle, et al, 2011). The extant research evidence from neuroscience, psychology and from economic studies of human capital development all support the importance of public investments in early childhood, particularly for children from economically disadvantaged families.

The differences in the quality of the home learning environments of children are startling. Hart and Risley (1995) found that middle income parents spoke about 300 more words per hour to their children than typical poorer parents. Research in the UK has also found that only about 45% of the 20% poorest children ever have a bedtime story or a visit to a library. It would be easy to imagine that disadvantaged families are simply unable to provide, for economic or other reasons, an adequate home learning environment, but the evidence simply does not support that; there are numerous accounts of individual families and of whole minority ethnic communities, who support their children in succeeding against the odds of disadvantage. A survey of over 3,000 children aged three years of age carried out in the UK (EPPE project (Sylva et al, 2010), has shown how the quality of the home learning environment had a very long-term impact on their educational outcomes. As the report showed, although parents’ social class and levels of education were related to child outcomes, the quality of the Home Learning Environment was significantly more important. The data also showed that even within disadvantaged families the quality of the home learning environment was higher for the girls. If disadvantaged families have the capacity to support girls in early learning than they clearly have the capacity to do the same for their boys (Figure 2). While 37.9% of boys experienced a HLE that scored below 20, only 26.5% of the girls were disadvantaged in this way. Even more significantly the number of boys experiencing a HLE rated under 13 was nearly twice that experienced by girls (Siraj-Blatchford, 2010).

**Fig 2: Home learning environment, socio-economic status and gender**

<table>
<thead>
<tr>
<th></th>
<th>Boys</th>
<th>Girls</th>
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</thead>
<tbody>
<tr>
<td>HLE 0-13</td>
<td>206</td>
<td>102</td>
</tr>
<tr>
<td>HLE 14-19</td>
<td>381</td>
<td>284</td>
</tr>
<tr>
<td>HLE 20-24</td>
<td>376</td>
<td>351</td>
</tr>
<tr>
<td>HLE 25-32</td>
<td>463</td>
<td>497</td>
</tr>
<tr>
<td>HLE 33-45</td>
<td>122</td>
<td>224</td>
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<tr>
<td>Total</td>
<td>1548</td>
<td>1458</td>
</tr>
</tbody>
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The problem is therefore essentially one of aspiration and a lack of recognition of the level of influence that these early experiences have. The good news from the EPPE project and many other large-scale research studies, is that family interventions and high-quality pre-school education can support children in catching up and succeeding against the odds. It is in this respect that KidZania
has the greatest potential to raise both the young child’s and their family’s expectations as well as their aspirations for future success.

In recent years, innovative early childhood educators have often created tasks that relate to ‘real’ purposes and real-world situations for children in their early years. Coltman et al (2015) found, for example, that Enterprise Projects, which were familiar to the children in terms of workplaces that the children had visited, had an ‘authenticity’ that focussed children’s participation in a wide range of real maths activities involving, for example, book-keeping and accounting, the measurement of ingredients for refreshments, handling real money, etc. In our own work related to Education for Sustainable Development, we have also collected evidence of similar positive outcomes in relation to emergent literacy (Siraj-Blatchford and Brock, 2017). Young children who had never engaged in mark-making activities, became keen to carry out quantitative surveys, record items sold and write price labels and receipts. In many cases these activities motivated the children directly towards more focused writing, and reading and writing activities. This should not surprise us; Frank Smith was arguing from the 1970s that literacy is a complex socio-developmental achievement that is best considered as being like a ‘club’ that children join. Just like any other club that we as children or as adults participate in, it is important to recognise that we often need to be introduced to it, even accompanied in our first visits to it, by a more established and competent member (Smith, 1971).

The importance of recognising reading as an ‘emergent’ achievement is widely recognised. Learning to read is a creative process and there is a sense in which the child has to develop their own concept of reading, before they can do it. Early Childhood educators routinely encourage playful ‘mark-making’ as a natural prelude to writing. They read a range of different types of text to children, drawing their attention to the value and uses of text in the world around them. They encourage ‘literacy play’ in the nursery, setting up pretend office play environments, libraries and story books for children to integrate into their play. Educators who promote emergent literacy also provide positive role models by showing children the value they place on their own use of print and encourage the children to develop an emergent awareness of the nature and value of these resources for themselves. Furthermore, many educators committed to emergent literacy encourage parents to read to their children and ensure that their children see them reading for their own purposes. The KidZania project adds to all of this a wider relevance and context of the world of work and enterprise. With appropriate outreach into early childhood settings, KidZania could promote the application of emergent literacy within STEM role-playing contexts, promoting at the same time an emergent curriculum model for the STEM subjects themselves (Siraj-Blatchford and MacLeod-Brudenell, 1999, Siraj-Blatchford, 2001, Siraj-Blatchford and Whitbread, 2003, Siraj-Blatchford and Siraj-Blatchford, 2006).

All of this is clearly relevant beyond literacy and numeracy, and what Dr Ger Graus of KidZania has argued is quite profoundly the case: “Children can only aspire to what they know exists”. If they are to aspire to a particular role, whether it be reader, writer, firefighter, scientist or veterinary surgeon (to use some random examples), they first need to be introduced to the role.

Our analysis of the ‘scripts’ which define the role of the adults supporting the children role-play at KidZania provides an illustration of the sort of ‘tutorial’ support documented in many classic studies of early learning. These studies provide a powerful justification for the KidZania approach and corroborative evidence for the focus upon occupational ‘roles’. Wood, Bruner and Ross (1976) argued that in spite of the importance of play, tutorial interactions were also ‘crucial’ features of infancy and childhood. In their seminal study, children were observed with an adult supporting their completion of a block construction task. The authors showed that effective tutoring involved much more than merely modelling (the child did not simply imitate the adults), but benefited from the adult providing ‘scaffolding’ where they carried out those parts of the task that would otherwise be
beyond the child’s capability. By this means the tutors allowed the child to concentrate and complete those aspects of the task that were within their current capability. The effective tutors maintained “direction” in the problem solving, drawing the child’s attention to “critical features”; they controlled their “frustration” and demonstrated solutions only when the learner could recognise them.

Even more significantly, Wood et al (1976) argued that the learner must always be able to recognise what constituted the learning objective before s/he was able to take any meaningful steps leading to it without assistance. They argued that, beyond the narrow margins and opportunities for serendipity, it was important to recognise that for every learner, “Comprehension of the solution must precede production” (op cit p 90). Similarly, a child must understand what the practice of writing is before they can adopt the role of writer, and they must understand what a fireman, veterinary surgeon or fruitologist does, before they can adopt or aspire to those roles effectively either in their play or in later life.

Wood et al’s use of the term ‘scaffolding’ in this context drew upon Vygotskys identification of the child’s ‘zone of proximal development’ (ZPD), a zone that includes everything that is achievable with assistance, that would otherwise lay beyond individual capability. The zone clearly varies with culture, society and experience but it must be fostered in joint activity that creates a context for child and expert tutor to interact within a social context. The crucial aspect here is that the assistance, where it is required, must be appropriate to the needs of the learner. Studies with mothers and their very young children (for example Cross, 1977), have also found that mothers intuitively adjust their utterances to the edge of their children’s linguistic competence. Adults assisting young children to learn must be aware of their levels of understanding and competence, and respond appropriately.

Our analysis of the KidZania scripts demonstrated an awareness by their authors of many of the essential features that define the basic work roles that are offered to the children. In the context of early childhood these cannot be taken for granted as they constitute pre-requisite understandings of the roles involved. To take a concrete example from the case of the fruitologist script, some of the pre-requisite schemes that were identified included hand-washing, blending, mixing, tasting, designing, packaging and marketing. As the illustration (Figure 3) below demonstrates, some minimum combination of these must constitute sufficiency in terms of gaining a basic understanding of the role of a fruitologist.

Figure 3: An emerging fruitologist
From our consideration of the learning process above, we can see that this must be a necessary but insufficient stage in the process of gaining competency in the role. The development of capability emerges as children bring together pre-requisite component schemes. These schemes may be necessary, but they are not sufficient in themselves to determine the learning outcomes. They are drawn together in the child’s mind initially as a complex ‘role’, in the first unique and individual creative act of learning that reaches towards an extended period of developing capability.

The principle of emergent learning recognises that the mind is essentially a complex and adaptive system where new concepts progressively ‘emerge’. To draw upon Wood et al once more:

“The acquisition of skill in the human child can be fruitfully conceived as a hierarchical program in which component skills are combined into ‘higher skills’ by appropriate orchestration to meet new more complex task requirements (Bruner, 1973). The process is analogous to problem solving in which mastery of ‘lower order’ or constituent problems in a sine qua non for success with a larger problem, each level influencing each other – as with reading where the deciphering of words makes possible the deciphering of sentences, and sentences then aid in the deciphering of particular words (Smith, 1971).” (op cit, p89)

The model below (Figure 4) provides an illustration of the role of the adult in introducing new experiences to children in the early years, and emphasises the need to support the child’s engagement and full immersion in the playful activity: Flow.

Flow is the mental state of operation in which a person in an activity is fully immersed in a feeling of energised focus, full involvement and success in the process of the activity (Csíkszentmihályi, 1990). ‘Free Flow Play’ has been promoted in UK early childhood education for many years (Bruce, 1991). It has been identified as being a key condition for children’s learning, and for their aspirations to unfold (Siraj-Blatchford & Brock, 2016). The adult’s role is that of introducing the child to new activities to support new skills and concepts, building upon skills and knowledge the child already holds, as promoted in the EYFS (DfE, 2014). The large circle demonstrates the need for the adult to provide time and space for the child to apply these skills in the activity offered, and to apply them to a range of contexts. This requires the adult to ‘seed’ the environment. The focussed activity (small circle at the top of the model), in terms of the KidZania activities, is the adult explaining a job role as per the scripts and modelling specific skills/activities.

*Figure 4: The SchemaPlay model*
In our visit to KidZania we observed the adults providing focused activities to support the children’s developing understanding of the roles.

The UK Early Years Foundation Stage (EYFS) (DfE, 2014) makes it clear that children should be carefully supported in imaginative and role-play development, and that materials should be accessible to children to allow skills and knowledge to come to fruition. Kitson’s (2005, p11) research found that when educators provide “sympathetic and interactive interventions” to promote imaginative play, they can “stimulate, motivate, and facilitate” children’s opportunities to work at a deeper level than would be possible if they were “left to their own devices”. This view is also shared by Bergen (2002), who recognised that lack of support for imagination/role-play can impact children’s ability to function at a cognitive level beyond the most basic. Much other research provides evidence of the importance and relevance of enabling role-play and children’s imagination for supporting social and emotional development, and the intellect (Sutton-Smith, 1988; Elkind, 2007; Broadhead and English, 2005).

The preliminary study and methodological trial

Preliminary fieldwork was carried out at the KidZania Westfield Centre, London, in September 2017. An opportunity sample of 4 and 5-year-old children were first visited in their homes and interviewed to identify their initial perceptions of a number of occupational roles. George Kelly’s (1991) Repertory Grid, triad-elicitation method was applied and individual children were shown three different pictures of a person carrying out an occupation (particular care was taken to hide the gender of the workers in the images provided), they were then asked to identify what they think made two of the pictures similar and the other the odd one out. The technique allowed us to elicit the constructs applied by the respondent in differentiating between the occupational roles. Further questioning provided us with detailed knowledge, or as sometimes was the case, evidence of misinterpretations and a lack of an awareness of particular occupational features. Five sets of three pictures were used. After playing this ‘game of threes’, each of the pictures was considered separately with the child explaining their understanding of each role, and then putting the pictures into their order of job preference and stating which job, if any, they would certainly not like to do. This provided a baseline of their knowledge and understanding of job roles for later comparing with their responses following the visit.

Three days later, the children attended KidZania in London. KidZania is designed for children aged between four and fourteen where they are encouraged to independently explore and try out a variety of roles using real-life activities to, “…test their skills in a variety of professions in an indoor city run by kids” (KidZania, 2017: 1). The children engaged in, and discovered, jobs that they had not heard of before, through activities, such as a ‘Fruitologist’ and a ‘Pet Well-Being Expert’. The scripts for each adult who introduced the roles that the children engaged have been reviewed and the operative schemes (movement activities or skills), which support schema (conceptual knowledge), were identified and related to the Early Years Foundation Stage (EYFS) Curriculum Guidance for England (BAECE, 2017). This initial analysis of the potential contribution of the activities that the children engaged in are provided in Appendix A.

Our observations of the children’s activity at the Centre are summarised in Appendix B. One general finding was that the children were often significantly discouraged by the length of the queues for some activities. Given the short time currently available for free-flow play we felt that it might be possible to use the queue time more productively to engage the children waiting in open ended role play. One example in the case of the Fruitologist activity would be to engage them in market research tastings etc.
A week later the children were visited in their school to be asked specific questions about their experiences at KidZania in order to ascertain whether their knowledge of job roles had changed, whether their views had changed about their choices of jobs, and whether they could recall the main learning objectives provided by each role (the learning objectives measured were those identified in the job activity scripts). Unfortunately, we found that the children were only able to recall a limited amount of the knowledge content of the activities, and were unable to make any links or associations between the activities and design, technology, science or mathematics. We also reviewed communications from parents who reported on what they had been told about their children’s visit to KidZania:

"Matilda’ came home talking about making Smothies. We looked up how to make them and we made a strawberry and blueberry smoothie. Matilda knew that you need to eat five fruits a day."

"Joanna’ has told me all about putting dogs to sleep before having an operation and has been playing vets with her toy animals."

"Naomi’ loved her afternoon at KidZania and told me all about what dogs cannot eat. She has a toy dog and has been telling me not to give him chocolate."

Although the data collected was limited by the small sample used for this pilot study, there is evidence of how the children made their activity choices. Appendix A shows that in all cases the children either chose an activity that they had said they would have success in, or an activity that they had previously perceived and had some informed knowledge of. The second and third activities chosen by the boys in the sample were more physical and selected either because there was less of a queue or because they felt that they would be successful. Two girls independently selected an activity based upon their interests and known skills. Other activities they took part in were generally engaged in as a group, providing support to one another in unknown territory, such as in Fruitologist and Pet Well-Being Expert job roles.

Significantly the activity choices made by the children sampled on their visit to KidZania seemed to have been influenced by the individual child’s perceptions of likely success, and whether they had a fixed or an acquirable view of intelligence (Dweck and Leggett, 1988; Hong et al., 1997; Mueller and Dweck, 1998; Sorich-Blackwell, 2001). Wigfield, Eccles, Schiefele, Roser & Davis- Kean (2007) explain that children’s self-concept of ability has a huge impact on children’s attainment, as does effective memories and their interpretation of experiences. Studies have also shown that students who believe that intelligence is a fixed quantity (‘entity theorists’) are particularly vulnerable to decreased performance when they realise that they are at risk of failing, whereas students who view intelligence as acquirable (‘incremental theorists’) appear better able to remain effective learners (Dweck and Leggett, 1988). Arguably this leaves us with a significant social and moral responsibility as educators in supporting the belief that intelligence is acquirable.

Children’s goals and ideas of what they would like to do did appeared to be based on their ideas about themselves. Their self-schema appeared to have a profound impact, especially on their first choice of activity. Self-concept is central to children’s aspirations and in terms of development children may be considered to simply progress towards an adjustment to apparent reality. In the absence of intervention, they progressively learn to accept the occupational role that is offered to those of their gender and social background.

The prestige afforded by a role is important and it is about ‘learning’ the role, adopting it, and being immersed in sociodramatic free-flow play. Recent research on sustainable development found that this type of modelled play can have dramatic changes to children’s learning outcomes as well as to
their self-belief (Siraj-Blatchford & Brock, 2017). The four-hour experience at KidZania enabled the children sampled to apply known knowledge and to build upon this through activity. There was also an opportunity to develop new skills and new constructs. In contrast to good practice in early childhood pre-school settings, insufficient time was given for the children to engage in free role play. The only examples of flow observed during our visit were associated with one of the boys playing football. Whilst the scripts did promote opportunities for free-flow play, for example the Fruitologist’s script included customer market research and marketing, these could not be followed through due to lack of time. This may suggest, for this age group, that there is a need to provide additional free-flow play time following on from the focused period of adult engagement.

In the follow-up discussion with the children, it was clear that they had not come across the ‘Fruitologist’ role before and they were not aware of any links between learning at school and being able to do this job. In fact, when reviewing all the activities they were unaware of what they could learn at school to help them gain sufficient knowledge to be able to undertake any of the occupations. Perhaps this is something which could be emphasised at the end of each session? The Fruitologist activity, for example, had the potential to involve design, technology, some science and mathematics. This could support children’s self-belief in engagement in these curriculum areas and further develop their interests in role-play and occupations. The girls’ recall of the activity was not so much about the fruits or where they were from, but much more about the ‘doing’ actions (schemes) and the processes involved, such as putting the glue pellets into the machine, turning the wheel, pressing the keypad and tasting. There are obviously more operations’ (skills) involved, and a recommendation would be to consider how these skills can be better connected up to support children’s further hunger for knowledge of what a Fruitologist is and how it relates to other design activities (Appendix A).

The boys who carried out the recycling activities also recalled the operational skills, such as sorting, grouping, pressing a button to identify clothes on a screen, but they did not appear to have learnt very much about what recycling was about. The possibility of playing out these roles independently of adult intervention, and in small groups, would help children to develop the concept of each occupation; the ability to problem solve, make connections, listen to the ideas and thoughts of other children and talk through the sequence of stages together; thus clarifying their thinking and knowledge of the activity. However, it is recognised that these experiences are only for a period of twenty-minutes. A possibility to provide some form of extension activity, where children felt empowered, is strongly recommended.

Supporting children’s flow to consolidate skills and develop learning outcomes could present an opportunity for KidZania to provide an early childhood ‘outreach’ program and, as the analysis on children’s aspirations and success at school in the literature review suggests, it could have profound benefits to the Early Years Curriculum, children’s outcomes in the early years, and their later life prospects.

KidZania London should be commended for their diligence in breaking down stereotypical views of gender in relation to roles, as none of the children interviewed identified any particular role as being for a boy or a girl. However, the girls did select activities that they perceived girls ‘can do’, such as cooking, and caring. The boys opted for more physical activities such as climbing, recycling, football and being a police officer on the beat. This relates to the impact of the society and culture they are immersed in; children draw upon what is known, usually expected in terms of activity and their experience. It was also interesting to note from the initial interviews and triad-elicitation that none of the children chose to carry out an activity which they perceived to contain an element of risk, such as being a fire-fighter. The visit to KidZania did not change their views on this. Their concern may be due to over-exposure to news bulletins, but confirming this would require further research.
An argument can be made here for the children to engage in selecting targeted activities (e.g. ones that break down stereotypes) before a visit. These adult initiated activities could then be followed by freely chosen activities.

An important learning experience that developed in the department store at the end of the day left a lasting impression of the benefits of young children learning to engage in the economic world: Three girls, recognising that they had insufficient money to purchase a gift each, pooled their money together and were able to buy a set of three bracelets; an ideal outcome and a meaningful result to their problem-solving activity. This also provided them with an opportunity to reflect on the jobs they had taken part in, with the four-year old saying; “I didn’t do as much as I thought I would, so I have less money.”

Proposal: The development of a KidZania outreach program

Introduction and Rationale
In the UK, ‘The central aim of the EYFS is to meet the outcomes of the’ Every Child Matters’ imperative, i.e ‘for children to be healthy’; ‘to stay safe’; ‘to enjoy and achieve’; ‘to make a positive contribution’, and ‘to achieve economic wellbeing’ (DfE, 2014; DfE, 2004). Kidzania shares these aims; especially in its desire to help enable economic well-being and to support children to make a positive contribution to society. Opportunities to engage in activities in which children learn about a variety of job roles and earn money in their symbolic or pretend play is conducive to supporting these outcomes.

Free-flow role-play is a vital tool to support the children’s developing perceptions about careers and themselves; to experience the ‘Mr Ben’ effect of observing people in a job role; adults dressing up and ‘being a scientist’, ‘being an engineer’, ‘being a designer’, being a developer in ‘construction’. During this type of play where the adult shares the experience of taking on a ‘character’ and plays with the children, the skills of curiosity, creativity, collaboration and problem solving can be supported and there is a potential that this could have a profound effect on children’s perceptions of themselves and their future lives.

To achieve maximum effectiveness there is a need to increase the opportunities for the children to engage in free-flow play across many roles. To this end, we propose the development of an exemplar outreach program with supporting material, working in collaboration with two early childhood educators, and their pupils in a school identified as one in which at least some of the children are currently underachieving and lacking aspiration to pursue STEM related future careers. In developing the intervention, the intention will be to maximise the effectiveness of KidZania in terms of fulfilling the objectives of the EYFS curriculum, providing an exemplar of good practice to other settings and strong evaluated evidence of improvement.

Children are highly influenced by their surroundings: They learn through imitation and there is strong evidence to support the need to provide more and better positive role-models. Exposing them to diverse inspirational experiences, which provide opportunities to meet new people, to try out new activities and broaden their current skills and concepts is the purpose behind taking KidZania ‘on the road’.

KidZania is a worldwide franchise which has its only current UK operation in the west of London. An outreach programme may improve the profile of the London Centre and increase visitor numbers, but the main purpose will be to take the KidZania model into communities who would not ordinarily be able to access the London Centre.
The Outreach Program
In order to develop an Outreach model, we propose creating an exemplification of the project, at first with a single group of children at a primary school, where ideally there will be two reception classes (with children between four and five years of age). The proposal would be to introduce the KidZania Outreach to one of the reception classes, which would provide the ‘sample’ for the study, with the other class being used as a control group (they will subsequently benefit from their own visit and the use of the materials created). Both groups will be interviewed to create a baseline of repertory grid responses and post tested to identify changes/learning.

Our proposal includes visiting the school for one whole day, every other week, during term time, with half-a-day being spent observing play and the other half supporting the teacher with a targeted project, which will be defined by our observations from the previous visit.

The Boys Reading Commission, a UK all party parliamentary group identified three factors that contribute towards boys underachievement and we will address each directly:

1. The early home literacy learning environment for girls is stronger.
2. Teachers often have limited knowledge of contemporary and attractive texts for boys so that boys are not always given equal opportunity to develop their identity as a reader through reading for enjoyment.
3. Male gender identities; where boys tend not to value literacy as a mark of success.
   (National Literacy Trust, 2012)

Our intervention will:

- Provide support for families in recognising the problem and in improving the home learning environment for boys.
- We will identify and promote suitable literature.
- We will develop resources and methods that contribute towards the representation STEM in terms that identify the importance of communication and literacy skills. This is intended to have a dual role as it will also impact upon the perceptions of STEM held by the girls.

The National literacy trust (2012) has emphasised the importance of recruiting fathers and other male positive role models in supporting boys in their early literacy. We will therefore create materials for use by parents in supporting their child’s awareness of STEM occupations in the home. Our previous experience suggests that these resources will also encourage family males to become more generally involved in the education of the child promoting a recognition of importance of the home learning environment more generally.

Following Scutt et als (2013) review of the research evidence on inclusive practice in STEM we will also identify resources and teacher competencies to enrich the play environment for girls and boys to develop greater confidence in their spatial capabilities and awareness. Communication skills provide the foundations of literacy and activities, and materials and activities will be created to demonstrate the value of these to success in STEM professions. One concrete example of this will be the development of "teach me" videos where the children provide other children with video instructions on how to make things. This follows Scutt et al’s (2013) finding that girls particularly benefit, and develop their confidence, when they are placed in an 'expert' role in STEM activities. Resilience will also be developed by explicitly addressing the subject of the unfairness of occupational gender stereotypes using story books and drama.
We would expect the introduction stage to be run between November 2017 and Easter 2018, taking in a visit to KidZania with the sample group in December and again in April (this time with the control group as well). We will then be able to measure the outcomes of one group against the other, and establish the benefits to education/the EYFS of KidZania.

SchemaPlay will supply:

- Activity sheets to support the educators in facilitating role-play.
- Advice on the adjustment of specific target activities to suit the under 6 year olds.
- I-Can leaflets for children to take home to their parents to build upon the role-play themes and providing a context for teacher discussions and participation in learning with parents and carers.
- The final report for KidZania, summarising our findings, by May 2018.
- A copyright licence to reproduce resources produced for KidZania in connection with the Outreach Programme.

Post Script: Future developmental potential

As Coltman & Whitebread (2015:13) explain, “Whether we look forward to a capitalist or post-capitalist green economy, it is certain that we do need entrepreneurs. The term was first coined by Jean Baptiste Say, a French economist in the 19th century who argued that entrepreneurs were people who shifted economic resources out of an area of lower, and into an area of higher productivity and greater yield. Entrepreneurs, by this definition, create value. An entrepreneur is a person who has the ability to recognise opportunities of benefit to an enterprise or community, and the will and the capacity to undertake appropriate innovative action, while accepting any associated risks. It has often been observed that it takes courage to be an entrepreneur, and cool thinking.” This is an important definition of the term entrepreneur, which is often considered to be a skill driving people to be inscrutable, but we are anxious to promote greater understanding of the fact that entrepreneurial enterprise supports sustainability not only for the interests and livelihood of individual entrepreneurs, but in the interests and for the livelihoods of communities. SchemaPlay has a particular interest in the development of social entrepreneurial skills and attitudes from early childhood and has already been carrying out some significant work in this area associated with Education for Sustainable Citizenship (Siraj-Blatchford and Brock, 2017). SchemaPlay would welcome the opportunity to work in partnership with KidZania in developing these interest and concerns further.
### Appendix A: UK Early Years Foundation Stage (EYFS) Analysis

Links identified with development as included in the EYFS *Development Matters* (BAECE, 2017)

<table>
<thead>
<tr>
<th>Job Role/Activity</th>
<th>Personal, Social &amp; emotional Dev.</th>
<th>Language</th>
<th>Physical Dev.</th>
<th>Literacy</th>
<th>Mathematics</th>
<th>UTW/Expressive Arts &amp; Design.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruitologist</strong></td>
<td>Small groups carrying out market research is sometimes offered (script).</td>
<td>Children answer ‘how’ and ‘why’ questions (40-60 months).</td>
<td>Hand-eye co-ordination in turning a wheel and pressing buttons (30-50 months).</td>
<td>New vocabulary introduced, such as ‘glue pellets’, ‘Fruitologist’. (30-50 months).</td>
<td>Opportunities to recognise numbers/catagorise by taste. (40-60 months)</td>
<td>Introducing new events/job roles - supporting children to be able to talk about events at home (children took home a sticker) (30-50 months). Develop an interest in occupations and different ways of life (40-60 months).</td>
</tr>
<tr>
<td><strong>Pet well-being expert.</strong></td>
<td>Children were encouraged to answer questions about the care of pets and take account of one another’s ideas (40-60 months). Engage in an activity as part of a group (40-60 months).</td>
<td>Children are able to respond to instructions. (30-50 months). Supported to build up new vocabulary (30-50 months).</td>
<td>Handles tools and objects with increasing control. (40-60 months) Shows some consideration of hygiene practices and health awareness (40-60 months).</td>
<td>New vocabulary (30-50 months). Possibility to identify that text carries meaning (30-50 months).</td>
<td>Ability to sort objects (16-26 months). Use some language such as ‘more’ and ‘a lot’ (22-36 months). Using every-day language about money (40-60 months).</td>
<td>Starting to gain knowledge of living things, such as the care of dogs (40-60 months). Awareness of different occupations (40-60 months).</td>
</tr>
<tr>
<td><strong>Police Officer on the beat.</strong></td>
<td>Understanding how to adapt behaviour to different events (30-50 months).</td>
<td>Vocabulary that may be introduced: Suspicious, patrol, crowd control, role-model, citizens and fake merchandise (30-50 months).</td>
<td>Walking/moving around obstacles and spatial awareness (40-60 months).</td>
<td>Problem solving – the possibility to navigate streets.</td>
<td>Possibility to use radios (40-60 months).</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Observations

Child A and B (both girls) choosing painting as their first choice, with Child A advising, “Come on let’s do this, we can do this – it’s just painting.

Child D (boy) chose the role of a police officer, with his younger sister (Child E) following his desire. The child choosing the police officer role explained, “I did this before, but I think I want to do it again. I liked it last time.”

Child F (boy) opted to engage in wall climbing, which is seen as a relaxation activity. He said, “I saw this on my holiday. I want to have a go.” There was a long queue for this activity, but Child F was determined to have a go and was happy to wait.

Child C (girl) had been before and she opted to go by herself (with adult observation) to make a burger. She explained “I remember what to do I think, and I would like to have another go.”

Child G (boy) appeared anxious, he had not been before and asked to just walk around to start with. He spent forty minutes looking around and then chose the H&M recycling activity, stating, “My sister does this. She takes her old clothes and then can get new ones.”

In all cases, the perception of the tasks appeared to be considered by all children. Some taking into consideration affective memories and their interpretation of experience as well as locus control. It could also be considered that previous achievement in each activity also had some relevance.

For the second choice of activity, it was interesting to note that the girls came together (Child A, B, C and E,) and wanted to all engage in the same task, although this was only suggested by one (Child C). Child C has previously chosen an activity for herself. The activity chosen was a Fruitologist. The children did not know what the job entailed, but they did know about fruit juice and the girl choosing the activity recognised the logo of the company ‘Innocents’.

When finishing making fruit juices, three of the girls (Child B, C and E) stayed together and wanted to visit the vets – youngest girl’s choice, but the others said they also wanted to do it. All children have or know someone with a pet. The other girl (Child A) asked if the adult could look at her friends, but also check she was okay, as she wanted to join the queue next door, as she was hungry and wanted to make a biscuit. Unfortunately, this activity did not involve making a biscuit, but was a tasting activity. Demonstrating that this activity choice was considered in terms of perception of the activity. When asking further about her choice of the activity, she explained that she made a biscuit with the nuts once before at a fair. This provided evidence that she was drawing upon a previous experience, locus of control and previous achievement.

In all cases, the girls chose activities which required them to put on some form of role-play costume, which is known to help children immerse into character.

Child D for his second choice of activity chose to be an airline pilot. In the initial Triad-elicitation, this child had discussed knowledge of the role and recognised that there were pilots for holidays and pilots for military. Whilst looking at the pictures, he identified he would prefer to be a pilot for holidays, “Like the pilot who flew me home from France yesterday. The military pilot job is dangerous”. The queue unfortunately was quite long (It was the final week of the school holidays and a wet day), and therefore opted to do recycling instead, as it had a shorter queue.
Child F then chose football as his second option, but said to the adult he might have a go at being a pilot later. He played football and talked at length about working as a team after. After playing football, Child F explained he was tired and left forty-five minutes earlier than the rest of the group.

Child G chose making a burger as his second choice. He asked, “Will I need to wash my hands like at school?” He demonstrated an awareness of personal hygiene before undertaking an activity with food.

Child D chose for his final activity to play football. He demonstrated good physical skills (as per normative development milestones) in this activity. During the game he became fully immersed and was in free-flow.

This small pilot study so far after one day at KidZania provided evidence that children were choosing activities that they could in some way relate to or understand. It also appeared that self-identify/self-belief plays a substantial part in children’s choices and whether it is because these young children are not used to regularly being able to see themselves in the role of another it is difficult to say, but it does appear that fear of the unknown and perhaps failure impact choices and therefore could be considered a hindrance to children’s developing aspirations.

A few days after the children’s visit to KidZania, they were invited to share their knowledge about the jobs that they had taken part in.

**Recall of the Fruitologist activity (chosen by one girl and three girls joined her):**
“I don’t remember what the person was called that did the job...um...but you had to mix the juices and put the glue pellets into the machine for the packaging, and turn the wheel and press a button. I don’t know what you might need to learn to do the job. Um...you wear a white jacket like a doctor, or like a chemist or even like a chef. They sometimes wear white don’t they?” I don’t know what you would do or learn to become a person that does that.”

**Recall of H & M Recycling activity (chosen by two boys independently):**
“Well you got things, clothes and then sorted them. I think there was polyester and cottons. You sorted them to be recycled. Recycled means you don’t have to make things you know from the start. I don’t know why I should recycle. I do know you need to sort things and put them in different piles. Some things were ripped – you couldn’t wear them anymore, so you might as well recycle them...I think...yes, sounds right. ” I don’t think you need to learn anything at school – may be just know how to sort things. I think it is quite an easy job.”

“Yes. I remember this activity. Recycling is needed. I don’t know what it means. I did sorting – lots of clothes with rips in them. I got polyester and cotton sorted.”

**Recall of the Police activity (chosen by one boy and his younger sister joined him).**
“You need to have a stern face and walk funny. You put on a uniform so people know you are the Police. Your job is to catch baddies and put them in the jail. Yes, that’s the job. We just walked and I think we didn’t see any baddies because we didn’t catch one. There were a lot of people so maybe the baddie was hiding. He must have been. I don’t think you need to learn anything for this job – do you do any writing? I didn’t do any writing just walking.”

“I dressed up as a police officer. I walked the street following a lady. She showed us.”
Recall of the Vet activity:
“Well, there was a dog, but it was pretend so it wasn’t sick, but we pretended it was and I put it to sleep so we could get the nail varnish out of its tummy. I think you need to learn at school about bones and hearts.”

“I remember we looked at pictures and poo tells you if your dog’s tummy is poorly. If the poo is runny your dog is sick.”

“I have a dog and they don’t just get sick tummies. They get bad toes – long toe nails which is cancer and your dog gets very tired all the time. I have been to the vets and the lady said we could have tablets. The waiting room was very funny – lots of animals. Some of them didn’t like my dog. The cats didn’t like my dog. The all made funny noises at her. I don’t know what you need to learn to be a vet, but may be about food and may be about medicine which you need to learn to be a doctor as well. Yes, I think you need to learn about medicine.”

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