Fusion Cities of the Future Report 2019

Contents

1. Acknowledgements

The success of the first Cities of the Future meeting was due to the support and assistance of many people. Firstly, appreciation for the City of London Corporation for their support of the meeting and the provision of such a wonderful venue and to all the project team who assisted in the planning and delivery of this programme. To the Lord Mayor Peter Estlin for his focus on the importance of Fusion Skills for the success of future citizens. Gratitude is expressed to all the attendees, speakers, artists and contributors to the 'torchlight' moments who made the commitment, both in terms of time and finances, to be part of this initiative and for their participation in the sessions, sharing of their wonderful ideas, and contribution to the text, creativity and ideas in this report. I heartily thank you all and look forward to the next two years as we amplify and implement the innovations which emerged. – Professor Anne Bamford

2. Introduction

The City of London is widely referred to simply as the City and is also colloquially known as the Square Mile, as it is 1.12 sq. mi (716.80 acres; 2.90 sq. km) in area. The population of the City of London is small (just under 10,000) but every day over 500,000 people come into the Square Mile to work, and the City generates around a quarter of the United Kingdom's (UK) tax revenue. The area is also home to 27 major cultural and creative institutions and over 10 million visit the City as tourists each year. It constituted most of London from its settlement by the Romans in the 1st century AD to the Middle Ages, but the agglomeration has since grown far beyond the City's borders. The City claims it was the original 'co-working space' as it has always had different disciplines rubbing shoulders. The buildings and their characters are a mix of old and new. It is a great place to wander and for a small area it is packed with surprises.

City of London is home to 27 major Cultural and Creative Institutions

10 million individuals visit the City as tourists each year

The City of London Corporation (City Corporation) is the governing body of the Square Mile and provides local government and policing services in the City, as well as extending its reach beyond the boundaries of the Square Mile with responsibilities across public, private and charitable sectors. The City Corporation is dedicated to a vibrant and thriving City, supporting a diverse and sustainable London within a globally successful UK.

On June 7, 2019 the first of a series of three annual meetings were held in the City of London, UK, to focus on developing a national and international standard for Fusion Skills including a Fusion Assessment Tool influencing schools and lifelong learning. The event focused on WHAT and HOW to develop these standards, both nationally and internationally, through a series of case studies, highlighting strategies used and best practices. A total of 160 people attended the event representing London, national and international businesses, charitable and Non-Govermental Organisation (NGO) sectors, Higher Education (HEI's),

government and policy makers, the tech sector, the education sector, cultural venues and cities of innovation from different locations and backgrounds.

The meeting is part of a three-year commitment with the aim that the original attendees come again in the second and third year of the event, and that each year, we double the number of people participating from each of the sectors. This will serve to form an influential network of people, organisations and 'places' where there is a clear link between education, business and the cultural and creative sector to develop and enhance skills for the future within an ethical context of social mobility and sustainability. It was an implicit aim that the event would create such a network which could amplify innovations already occurring and empower attendees to co-create new knowledge and practices. The meeting aimed to draw people together to form eco-systemic change and to shine a spotlight on sharing solutions based on common challenges.

The City of London Corporation is keen to collectively define the skills needed for the future in the same way as the Livery Companies and Guilds of the City of London historically developed and redefined the skills over centuries that underpinned the British economy. The City of London Corporation has a significant role in convening and action to bring this definition to life, and to ultimately making London a more digital and creative city.

The following report provides a rich summary of the influential ideas that emerged from the Fusion Cities of the Future event. This document should also be read in conjunction with the White Paper on Future Learning and Fusion Skills.

3. Why? Background to the event

The demands of the employment market are changing rapidly. What you learn in school inadequately prepares you for real work-life situations and future skill requirements. The pace of change has increased and there are significant disruptions to the 'status quo' that require different responses. Therefore, the Fusion Cities of the Future events create the context to raise significant questions and inspire transformation. The meetings bring together key places, people and organisations to motive people to campaign to specific groups and to achieve greater impact by sharing and growing their educational and aspirational experience, embracing innovation and helping people thrive. The vision is clear and compelling. Fusion skills are key to future success for individuals and the society as a whole. To achieve these, individuals and groups have united around Fusion Skills, despite very different places and starting points. The journeys and the focus are converging.

4. Who? The right people in the room

To engender a system more focused on Fusion Skills, there needs to be a global vision, and very local action. As a result, cities (or parts of cities) were invited where there is a clear link between education, business and the cultural and creative sector. They are forward-looking places which are working towards developing and enhancing skills for the future within an ethical context of social mobility and sustainability. In summary the attendees of the 2019 Fusion Cities of the Future event were:

- European and United Kingdom invited cities or parts of cities which are transforming the future by proactively combining education, culture and skills

- Cross-sector businesses and technology companies which are leading the future in terms of what society and the world of work will look like

- NGO's and other organisations who are already gathering like-minded people and testing, researching and piloting Fusion skills, Fusion learning and Fusion ways of working

- Individuals and organisations that are developing new tools for measuring and reporting the development of Fusion skills and qualities

- The creative, cultural and hybrid sectors which are challenging and redefining thinking

- Government and policy makers who are open to responding to some of the disruptions happening and the influence they will have on diverse areas of planning and implementation

- The higher education, vocational education and private education sectors who are proactively and open-mindedly researching, evidencing and theorising around the future

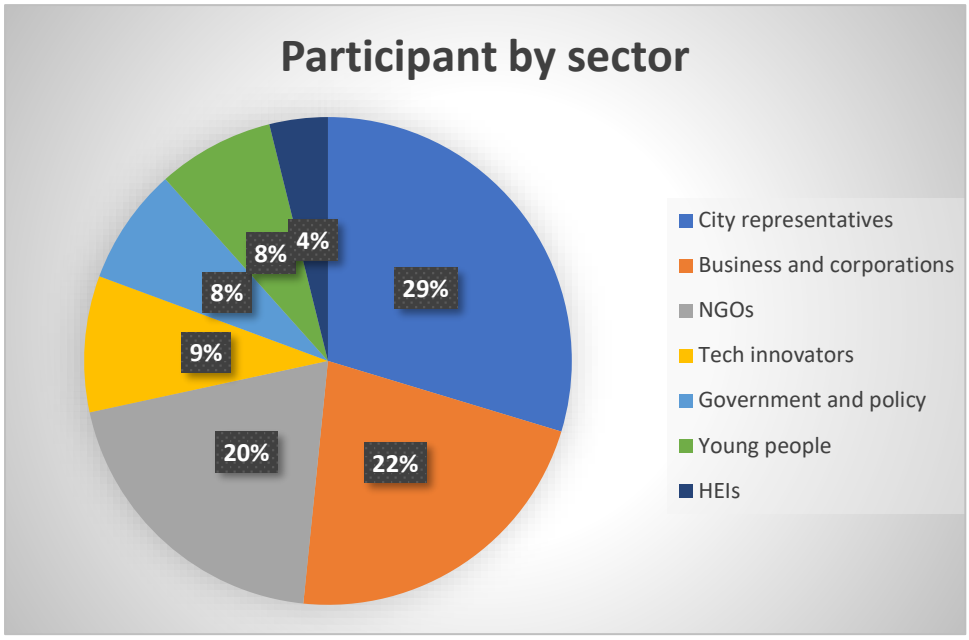
- Individuals who are innovators, thinkers, activists and influencers

- Young people who are redefining, re-evaluating and challenging the status quo

This balance of participants was important to provide a balance of voices coming from different backgrounds and different sectors. The common link was that everyone was committed to cross-sector partnership working, to sharing, and to driving change towards more relevance in education, culture and business. It was acknowledged that the seismic disruption of technology means that it is essential that the broad technology

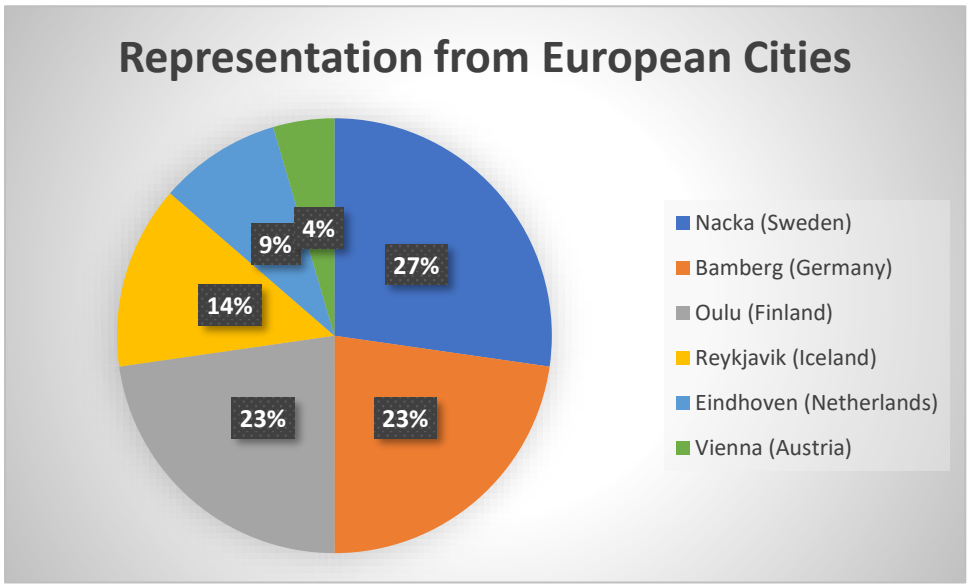
sectors were also central to the discussions to propose potential assistance and to remind us of the pervasive nature of the changes technology has brought. Figure 4.1 shows the participants by sector.

Figure 4.1 Participants by sector



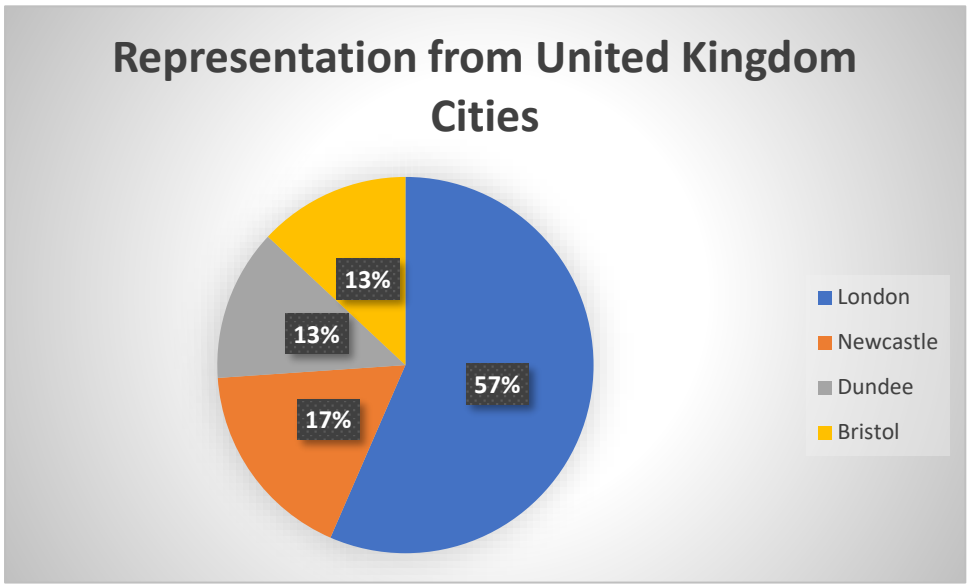
160 individuals in total attended the event

Figure 4.2 Participants by invited European cities



6 European Cities were participated in the event

Figure 4.3. Participants by invited United Kingdom city



4 Cities from the United Kingdom participated in the event

First Poem reflecting the Meeting

Notetaking throughout the meeting was also captured by a poet, Paul Lyalls[1]. This is his first poem capturing the range of people and views in the room.

The Gathering

One-hundred and fifty game changers,

bigger picture re-arrangers.

Who can make it more than just anecdotal,

who might actually make it global.

Let's shine a torchlight,

there is no wrong or right

to finding a way to making it different,

there are always ways to overcome resistance.

[1] http://www.paul-lyalls.uk

And if all of this talent comes together,

there's nothing that can't be changed,

except the unpredictability

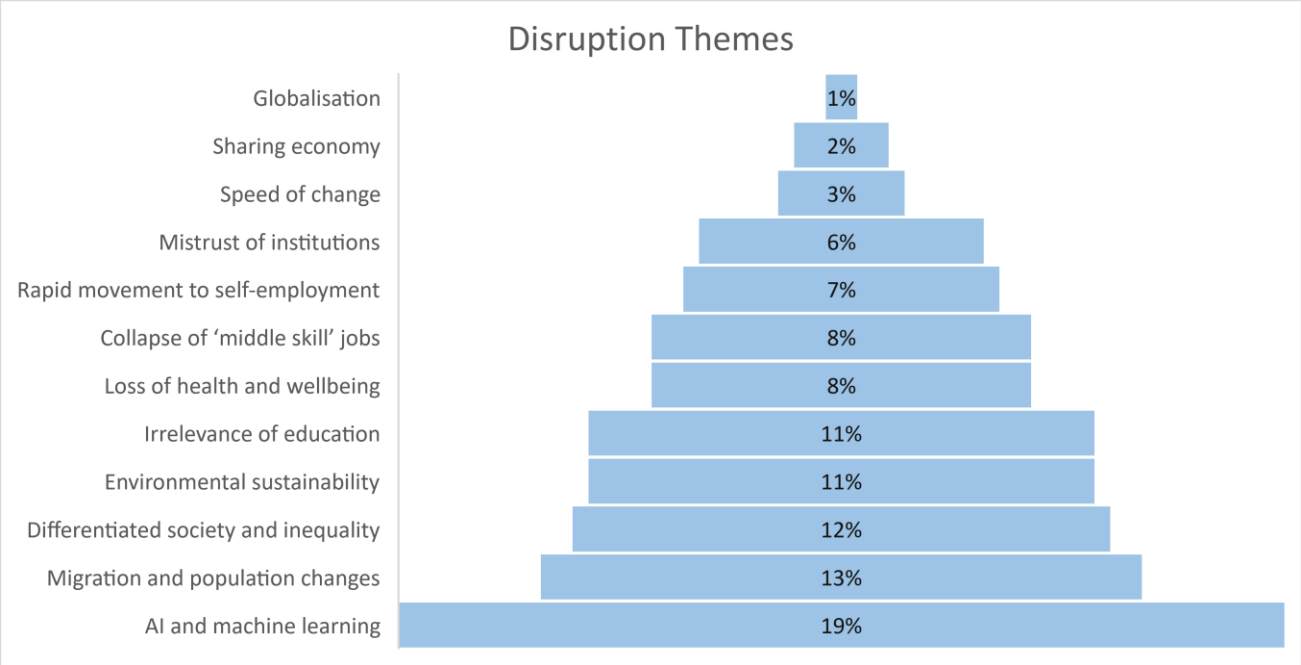
of the British summer weather!

The agenda for the meeting and the details of the questions asked to drive the discussions are contained in **Appendix Two**. These are included to inspire other areas to consider hosting their own meeting, using or adapting a methodology appropriate to their unique locality and context.

5. Disruptions we identified

In the opening stages of the meeting, the participants considered the fundamental disruptions that mean that it is not possible for society to continue a 'business as usual' approach. **Figure 5.1** shows the main groupings of the individual disruptions which were identified. From Figure 5.1 the major disruption factors identified were AI and machine learning; migration and population changes; differentiated society and inequality; environmental sustainability; and, irrelevance of education. Other main disruptions included loss of health and wellbeing; collapse of middle skilled jobs (also associated with AI and machine learning and greater inequality); the movement to self-employment; and, a general mistrust of institutions. While there was wide support for the accuracy of these 'disruptions', some respondents also cautioned against, "Misconceived Futurology" and "GLIB assumptions about the future".

Figure 5.1 Disruption themes identified



The following sections provide some details of these disruptions and shows the interconnectedness between the disruptions often producing a combined effect of even greater disruption.

5.1 The influence of technology, including AI and machine learning

There was a clear view that one of the major disruptors was the pervasive influence of technology. It was acknowledged that technology radically transforms all aspects of our lives including education, transport, finance and housing. The participants identified new and emerging forms of technology with an even greater potential for initiating disruption, including areas such as, cyber security, digitalised banking/finance, data control, blockchain, robots, and, increased mobile and pervasive technology.

It was felt that different skills and talents were needed to boost digital productivity and competitiveness, and to enable people to thrive in their lives. It was noted that there were already significant skills gaps and a lack of supply of talented people to support digital innovation and enterprise.

Despite the pervasive nature of technology and its influence on our lives, it was acknowledged that the digital revolution was not reaching all people. For example, it was noted in the Lord Mayor's introduction that, 4.1 Million adults in the UK are still 'offline' and that 53% of UK employees do not have the essential tech skills required for the workplaces of today and tomorrow. Moreover, it was expressed that there was a need to remove digital barriers and improve access and participation. The Lord Mayor's initiative identified the importance of the three "C's" as the principles for digital innovation: competitiveness, creativity and citizenship.

While many positive aspects of technology were identified, there were also serious concerns raised regarding the pace of technological change and the potential negative impact on human interactions. The participants expressed a widespread distrust in AI and new technology and felt that it compromises the way we communicate with one another at a human level. The following comments give a flavour of the more general concerns expressed:

“People first not technology.”

“Nations are ceasing to trust each other because of AI. AI is biased.”

"Keep AI under control!"

"The gap between human adaptability and technological advancement is widening, making the 'onboarding' of diverse communities harder.”

It was suggested by several participants that technology was having a “de-humanising” effect and that education and broader society needed to counteract this trend. For example:

“Technology should be connecting people rather than alienating them”

“There are serious questions about technology. What is it for? [There is a] mismatch between the tech rate and the social value rate."

“Online meetings are alienating as there are no interpersonal skills”

“Homogenising technology is leading to a lack of diversity”

Concerns were also raised over the proliferation of ‘meta data’ with issues identified in terms of data security, information overload, lack of privacy and data leaks. There was a sense that technology was directly impacting upon education and the nature of work and that, if these domains did not adapt to the influence of technology, the results could be very negative, as the following quotes suggest:

“Automation means there will be less jobs”

"New mechanisms, with common centrality, as part business, education, health, technology and creativity. Work = Home"

5.2 Migration and population changes

Mass migration and increasing human mobility were identified as being major disruptions. It was felt that this trend would increase exponentially as the resources of the world become 'smaller'. Climate change and increasing inequality would lead to more forced migration. While increasing diversity was viewed by participants as a positive force, "Diversity = innovation", people commented on the increasing actual and virtual "walls and guarded borders". There was also the danger of increased alienation. Concurrently, mass population movement is increasingly threatening ethnic minorities and disaffecting "peripheral cultures". A connection was made between the 'global' nature of technology (especially mobile technology) and mass migration. The view was generally expressed that the lack of support given to migrant populations was leading to greater risk in terms of disruption. For example:

> "How can we develop intercultural fluency to enable people in all their diversity to live peacefully together in cities? What does an 'Equal City' look and feel like? What needs to change for us to have cities where people are adaptable, take responsibility for own learning and have agency?"

> "How do you ensure the most marginalised groups are involved [in society] and benefit? What is your current approach to fusion skills? How do you manage conflict between different groups?" How do you reduce social inequality? What are your targets? What will you do to offer meaningful career opportunities to people from marginalised communities?"

While mass migration was identified as a major factor in society change, it was also noted that there were other demographic changes at the local level. For example, there were increased proportions of elderly citizens and that people were living and working for longer and that, in some places, there was a radically changing ratio between old and young people. While there was a greater demand on social services, there was a more general move towards lower taxing economies.

There was an acknowledgement that there were generally inadequate approaches to responding to the disruptions of population change at the local or global level, as is exemplified through the repeated presence of the word "How?" in these quotes:

> "There are regional gaps in current approaches. How are we supporting social mobility? How are we strengthening resilience and agility?

> "How are we connecting marginalised communities? Infrastructure? Population flow – how?"

"HOW DO YOU INVOLVE HARD TO REACH/SEGREGATED COMMUNITIES?" [Shown in original capitalisation]

5.3 Differentiated society and inequality

Several significant inequalities were highlighted. These included:

- Economic changes leading to a growing gap between the rich and the poor
- The gap widening between young and old people
- The differentiation between people who were 'tech rich' and 'tech poor'
- The gap between the 'able' and the 'less-able'
- The gap between the high-skilled and the low-skilled
- Inequality between rural and urban areas
- Inequality in access to the really needed skills
- Wealth inequality

Some of the participants commented that they felt that society had reached a new 'high' in terms of inequality suggesting that we were at "peak inequality" or were experiencing "gross inequality". To support this

argument, participants expressed the view that there was a likelihood of significant negative impacts resulting from such a starkly differentiated society. For example, they predicted consequences such as:

> "Increased conflict and wars"
>
> "Rising levels of intolerance and division"
>
> "Widening inequality being expressed through public anger"
>
> "Political crises"
>
> "War"
>
> "Social unrest due to lack of tech access for some e.g. No broadband"
>
> "Polarisation"

Clearly, there was the sense that there were a growing number of 'inequalities' and that the risk for society of these inequalities posed a major concern.

5.4 Environmental sustainability

Perhaps understandably, environmental sustainability (and the lack thereof) was a major disruption. Participants spoke of a need for a more responsible interaction with the environment in order to avoid depletion or degradation of natural resources. It was felt that urgent action was needed if society was to have long-term environmental quality. Where environmental sustainability was not to be achieved, participants predicted:

- Climate change
- Pollution
- Environmental crises
- Pressure on natural resources
- Food shortages
- Global warming
- Ecological disaster
- Resources and food production unbalanced

- Water shortages
- Extinction
- Fuel shortages
- Loss of biodiversity

Current processes and practices were in some cases blamed for the lack of environmental sustainability. For example, one participant spoke about a "Live for Now" and a "greed" culture where people continue to consume regardless of the consequences. Another participant bemoaned the lack of "common sense" leading to increasing unsustainability. Comments were made that there has been "climate urgency without action".

By contrast, some groups saw that technology and new ways of working might lead to improvements in environmental sustainability and that these efforts needed to be amplified and shared. For example:

> "Could new forms of urbanisation address 'standard of life' and wellbeing as opposed to economic growth? How could these values be reflected at a policy level in your city? How do we tackle overcrowding?"

Other respondents saw carbon neutrality being more possible to achieve through boosting innovation in existing supply chains. As one person commented, "A commitment to digital intelligence at a high level could be used to grow our appreciation for a green future." For example:

> "A reduction in the current food supply could lead us towards a healthier and more diversified diet. Perhaps we could produce and eat an insect-based diet?"
>
> "Could AI and new technologies be more effectively used to boost agricultural production?"
>
> "Could technology reform transport? More bikes…more carbon neutral personal transport?"

The comment was also made that a "green new deal" would lead to a fall in the importance of "stuff" and that this would lead to radical economic change, with flow-on effects to education and workforce training and development.

5.5 Irrelevance of Education

What you learned in school does not prepare you for real work-life situations with adequate skills. In an increasingly differentiated society, there is also an increasingly differentiated school system. The differentiation is in what makes a 'good' education with the gap being between a school which prepares a child to flourish in the future, and a school which prepares a child for the past, largely leaving them behind in terms of the skills they will need in life and the world of work. Participants commented that the education system was ill-equipped to prepare people for the future. The school, as it largely exists today, was viewed as being irrelevant. Issues which were highlighted included:

- Devaluation of traditional qualifications
- Poor quality teacher training
- Loss of confidence within younger generation
- Young people not reaching aspirations
- Widespread boredom
- A lack of curiosity
- Young people lacking social skills
- Reduced funding for education
- Reduced funding for work with disadvantaged children including those with Special Educational Needs and Disabilities (SEND)
- University tuition fees and fees more generally being a barrier to education

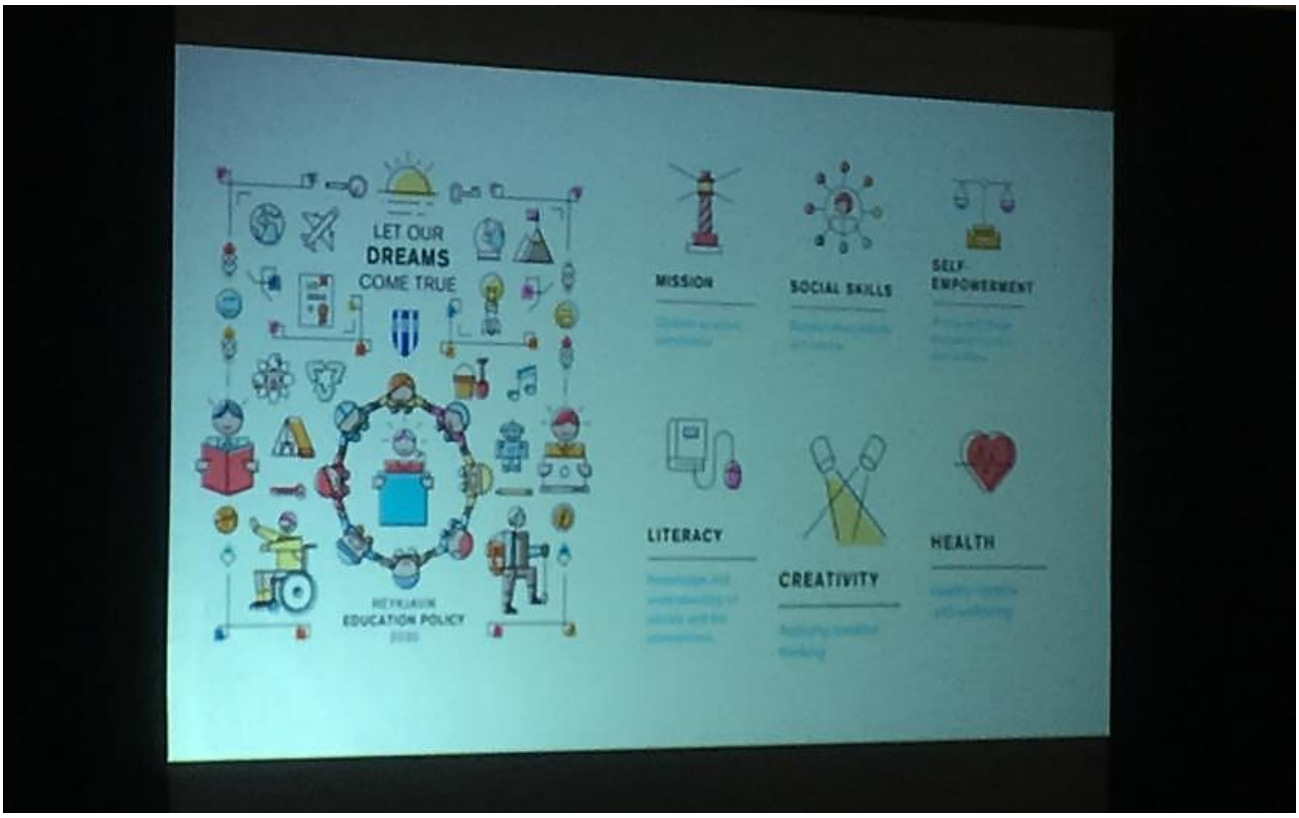
It was also felt that there was a chronic lag time in educational policy which meant that schools were largely out of touch with contemporary economies, let alone future skill requirements. For example:

> "There is a rapidly changing economic landscape owing to technology. How do education and skills systems respond to that? Drive that?"

> "School curriculum doesn't prepare people for real life. There is no recognition of the value of fusion skills."

Taking this argument further, participants commented that beyond 'doing nothing' more recent changes in school systems (especially in England) had meant that the irrelevance of schooling had actually increased. For example:

> "Increasing volumes of content in schools and consequent 'squeezing out' of creative, arts and physical subjects and the practical aspects of subjects has been catastrophic. Schools lack the workforce, system leadership, funding and finances to even get up to date with what is needed – let alone to lead it! Traditional approaches to education, training and recruitment are not working. Education is not addressing changing needs and disruptions."



Some participants thought that technology might itself drive reforms in education. For example, it was suggested that AI could be used for promoting more 'agile' education based on individualisation of approach and content to the specific needs of the learner. Another suggestion was that there could be greater ownership of learning by the individual as opposed to the 'school' or organisation and that individuals could access and develop their own learning plans through lifelong learning and bespoke content and approaches. This idea was summarised by one participant as being, "Agile Individualism in Education." Such an approach could focus more on 'learnability' and could lead to a "collapse of the centralised, one-size fits all education system" we currently have and that instead, "We should all own our learning." It was also predicted that as the gap grows between what businesses demand in terms of skills and the increasing irrelevance of the school sector, businesses are already starting to take responsibility for education. For example, the 'WeWork'[2] company has already developed a school in New York and plans to open more schools globally. By contrast, cautionary comments were also made by participants:

> "Where is it important for business to stay out of education?"
>
> "Can children be children?"

[2] See https://wegrow.com/

As one respondent succinctly put it, schools currently provide, “An Anachronistic Education.”

5.6 Loss of health and wellbeing

Associated with earlier disruptions identified in terms of environmental degradation and ‘de-humanisation’, participants identified that physical and mental health were likely to be disruptions. In terms of serious physical concerns raised, the following were highlighted as being significant disruptors:

- Antibiotic resistance
- Impact of obesity
- Emerging diseases and viruses

It was also felt that mental health issues had increased rapidly over the past decade and were likely to continue to increase in the future. It was argued that life was becoming more ‘fast-paced’ and that there was a lack of time for creativity and for human relationship building. Moreover, there was an over-emphasis on economic indicators and insufficient emphasis on happiness and wellbeing. Comments were also made about the lack of resilience. This point generated some debate with some people arguing that people should not have to be ‘resilient’ but rather that the environment surrounding people needed to change to be more ‘people friendly’. It was also argued that resilience was often used to mean ‘putting up with something’ and it was felt that this was not always a positive state of being. Participants also identified ‘loneliness’ and a ‘lack of housing’ as being disruptive factors which were on the increase and negatively impacted upon health and wellbeing. These views are summarised in these quotes:

> “Grow slow and don't break people”
>
> “Stop relying on Economic Indicators”
>
> “There is a continued focus on wealth and growth over happiness. Creativity is only used in the service of consumerism.”
>
> “There is little emphasis on well-being.”

5.7 Collapse of ‘middle skill’ jobs

Perceptions of the nature of work and jobs is rapidly changing with roles emerging which have not previously existed. These future roles are badly understood, and, as a result, there is a growing mismatch between skills demand and supply. One of the major changes identified was the growing demand for ‘higher order’ skills and, also for low skilled work, but the collapse of the demand for middle skilled workers. Participants pointed to the fact that the current education system and training provisions are largely geared to delivering the ‘middle’ while the middle was most likely to further contract as the impact of AI and mechanisation will be felt most sharply at the middle level. This poses significant questions in terms of people’s capacity for social mobility and the role of lifelong learning and education. Those people in the middle skilled level will either need to

learn to become higher skilled or be prepared to accept lower skilled work that is available. This in turn effects society and the economy and can lead to further widening of inequality. Participants could cite examples – the Uber driver with a PhD, the supermarket checkout operator with a fist class degree and so on. It was also noted that policy changes, especially in England might already be 'removing the rungs' on the career ladder, further separating lower and higher skilled workers. For example, the disappearance of lower level apprenticeships and access to work programmes. It was also noted that the more affluent and privileged people tend to get better access to the development of higher order skills and so consequently are more likely to gain the higher order jobs. The following comments emphasise the concerns raised in terms of the widening gap between high and low skills:

> "Global competition will lead to greater disparity between high skilled and low skilled workers."

> "Work and the economics of work will radically change and there needs to be a recognition of the changing skills needs."

> "A future workforce without fusion skills will be forced to remain as low skilled workers."

> "We will see more in work poverty. The collapse of the middle level of skills and a growing need for higher level skills."

5.8 Rapid movement to self-employment

In addition to the changes in the skills needed for future working, participants also highlighted that the nature of a 'working life' is itself changing. There is a rapid shift to self-employment and this trend impacts all levels of work, from low skilled jobs to the highest skilled jobs. As one respondent commented, the days of the "Corporate giants" are over and we are seeing smaller, "micro businesses." It was also noted, that self-employment was increasingly attractive and that larger businesses needed to "boost the attractiveness of certain places, spaces and companies and jobs if they expected to be able to attract talent and create jobs."

For those people still working for larger corporations, the reverberations of this trend are being felt. For example, participants argued that the rapid movement to self -employment is impacted on the broader nature of work by:

- Changing recruitment practices
- Leading to talent shortages
- Resulting in a failure to retain talent
- Increasing flexible and part-time working

For those people choosing, or being obliged, to work for themselves there are also direct implications on the nature of their working life. For example, there will be more solo-working, remote working and changes in working hours. It was also indicated that there are, “dissolving of the boundaries between 'work' + 'not work' and how we consider the different parts of our lives.” There will be an increasing role for individuals to seek training (for example, in Singapore every person has a $250 per person allocation for individual training and learning). There is a lack of relevance of the current education and skills policy design to meet the demands of a workforce which will soon be predominately self-employed.

5.9 Mistrust of institutions

Concurrent with the rapid changes in broader society, it was felt that there was a growing mistrust of institutions and a resistance to authority. The participants expressed the view that there was a mistrust of government, politics, and a resistance to authority. In an ultimate sense, one person felt that this could result in “Extreme Left/Right politicians and ultimately anarchy.” It was argued that there is a “crisis of representative democracy and social instability.” At the very least, it was acknowledged that there was a lack of connection between government policy and actions and the impact of technology. Inequalities in society were also fuelling mistrust with, “Unaccountable elites”, and “Social unrest” and “social revolt”, resulting from “a structural lack of opportunity.” In response to the mistrust of institutions, there were seen to be some ‘counter trends.’ For example:

> “Policy priorities need AMBITION”
>
> “Activism is on the up and we are leading to a state of over-democratisation”
>
> “Power is moving to the margins of society”
>
> “There is an awakening of consciousness”
>
> “Networks are forming, and people are self-organising to overcome the perceived shortcomings of the formal institutions.”
>
> “What will local governance morph into?"

Second Poem reflecting the Meeting

This is the second of the poems by poet-recorder Paul Lyalls.

We Are Words

Their meaning, their dreaming the message they are streaming,

we use them to find our tribes

to make collaborations and allies

because we are words.

Their story, their song,

they define, refine what we can get done

always on the tip of your tongue,

because we are words.

They connect us, correct us

help us find one another

yes they collect us,

ashes to ashes, dust to dust

a lie, a promise a trust

Because we are words.

5.10 Speed of change

There were contrasting views on the speed of change. For some people there was a perception that change was occurring too rapidly, while other people felt that change was occurring at a pace which was far too slow. For those people who felt it was happening too fast, the view was there is exponential technological advancement and that an increasingly uncertain world required constant lifelong learning. It was also felt that the speed of change led to a perception of uncertainty where no one can predict "what things will look like in even 5 years' time." The rapidity of change led to a sense of "transience" and that "advances are happening faster than we can cope with."

By contrast, those believing that society is changing too slowly felt that "the old ways of thinking need to go" and that "we need to change and change quickly." As is indicated in the following comment, change needs to happen at greater pace:

> "Why haven't we started making changes before now? Do you think society will be able to adapt to the changes that need to happen?"

It was felt that there was an urgent need for "experiences and systems to support fusion skills" and that there were matters of urgency which needed immediate action. For example:

> "How to tackle demographic changes (elderly, less tax money)?"

> "How to interact and work globally without compromising with local initiatives and governance?"

> "How to develop and maintain democracy systems in the digital world?"

> "How does your city's approach target the most vulnerable and marginalised young people - the 'highest-hanging fruit'?"

5.11 Sharing economy

According to the Oxford English Dictionary[3], the sharing economy is an economic system in which assets or services are shared between private individuals, either for free or for a fee, typically by means of the Internet. The participants identified the sharing economy as one of the significant disruptors, which could be both a positive and negative change. For instance, the sharing economy offered a point of innovation and could potentially increase the abundance in society especially if it impacted on the developing economies. It also was seen to have the potential to address shortages of skills and services if the 'sharing' model was more widely adopted in terms of skills and services rather than fixed assets. A commonly cited example of the sharing economy is *Airbnb,* where in theory all people benefit from the sharing of assets. For example, the coordinating website takes a fee, but the owners of the properties generate extra income that they might not otherwise have and at the same time members of the public can get access to more affordable holiday experiences of a unique type. Of course, such a model is not without its critics, with people arguing it reduces 'real jobs' in the hospitality sector, increases insurance risks, and transforms the 'liveability' of certain cities and localities. Within the theme of Fusion Skills, it was suggested that models derived from the sharing economy could be used to amplify learning and to share the access to these higher order skills. For example, we could search for a Fusion Skill existing in an area and 'rent' that skill as opposed to renting a room, booking a taxi trip or so on. This potential aspect of the sharing economy is shown in the following comment:

> "How can we share best practice? Exchange ideas? How do we best engage youth? What do you see as the greatest challenge in this area?

Potentially, "ICT-enabled platforms" could be created as a hub for exchanges of Fusion Skills and services drawing on non-market logics such as sharing, lending, gifting and swapping as well as market logics such as renting and selling. It is argued that the sharing economy could generate abundance by enabling access to 'spare' skills assets and facilitating exchanges via a platform. This could, at least in theory, lead to greater equality and enable unprecedented scalability.

5.12 Globalisation

There appeared to be a tension between the increasingly Global Society and an equally intensive move towards greater localisation and 'place-based' practices. For the participants, what was called for was for a

[3] Concise Oxford English Dictionary (2011) Oxford University Press, Oxford, UK

global vision, manifesto and "movement" but for very local action. In terms of the case studies presented by the invited cities and areas (see Section 10), there was a sense of them containing a clear, unambiguous vision for the future and clear guidance for future actions. And yet, the actions were very local, highlighting the unique nuances of the physical areas and the local populations being served. The case studies were an example of what the participants referred to as 'glocal' projects – a globalised vision supported by very locally-based action. This concept seemed to not solely be a 'disruption' but also to signal the approach that should be taken in terms of Fusion Skills. As one comment effectively summarised it, "We are not the future. We are the movement. People at the local level will be the future."

6. What are the Fusion Skills?

A framework definition helps to make sense of what is going on. Without any definition, it is hard to promote clear lines of action. While it is acknowledged that by their very nature, future skills are dynamic and changing, a short working definition allows us to: Understand what is out there; determine which of the various definitions has a sound evidence base; and, focus on those aspects of the definition that play to the different strengths around the city. The City can employ its assets and assembling powers to raise visibility around this definition, building on London's unique ability and positioning to bring education, business and culture together.

According to Mark Hoban (2019, p2)[4], "*We need transformational, strategic, system-wide change.*" In 2018, Nesta[5] published the UK's first publicly available data-driven skills taxonomy based on analysis of 41 million job adverts. This work identified a set of 66 'transversal' skills, such as communication, organisational skills and collaboration, that are required in many occupations in the UK today. Subsequently, in 2019, the City of London Corporation commissioned a study[6] to determine if this very long list of transversal skills could be further categorised and prioritised into a shorter list. Three-quarters (74%) of employers prioritised transferable skills equal to or above technical skills when recruiting new employees. The top 12 transferable skills rated by employers were:

1. Oral communication / presentation skills
2. Collaboration and teamwork
3. Initiative

[4] Financial Services Skills Taskforce (2019) *Interim Report* The City UK, London

[5] Djumalieva j , Lima A and Sleeman C. (2018) Classifying Occupations According to their Skill Requirements in Job Advertisements, ESCoE Discussion Paper 2018-04, https://www.escoe.ac.uk/wp-content/uploads/2018/03/ESCoE-DP-2018-04.pdf

[6] Nesta (2019) "Transferable Skills in the Workplace: Key findings from a survey of UK employers" City of London https://www.cityoflondon.gov.uk/services/education-learning/schools/Documents/transferable-skills-in-the-workplace.pdf

4. Problem solving

5. Organisational skills (planning, time management, deadlines, prioritisation, multi-tasking)

6. Adaptability / flexibility

7. Written communication

8. Independent working / autonomy

9. Critical thinking

10. Resilience

11. Creativity

12. Analysis and evaluation skills

This list became known as the 'Fusion Skills.' The word 'Fusion' was chosen deliberately. Firstly, it implies the 'fusion' of different disciplines as the future is unlikely to be organised into clearly defined subjects such as science, mathematics and visual arts and so on. Also, fusion shows the way it fuses together technology with the arts, the business sector with the public sector, the profit making with the charitable and cultural sectors and so on. Fusion Skills have sometimes been called 'soft skills', 'essential skills.' 'Future skills', 'steam skills', 'Cyber skills', competencies, qualities, characters and so on. Each of these terms brings with it unwanted historical and/or conceptual 'baggage. For example:

- **'Soft skills' might imply they are not important or are easy to get, whereas the opposite is true**
- **'Essential skills' might be accurate but is a damning assessment for someone who does not have the 'essential' skills**
- **'Future skills' imply** that the skills are not needed *now* whereas all the indicators suggest that these skills are vital now
- **'STEAM skills'** imply that the skills exist only in science, maths, engineering, technology and the arts, whereas they can be developed through an enormous range of human activities and are best gained at intersections across diverse areas
- **'Digital and cyber skills'** implies that these are only obtained or useful in the 'virtual or technological world, whereas we know that for businesses these are even more important than the technical skills and exist very much in both the 'analogue' and the digital worlds

Even the use of 'transversal' is confusing, as in English this word means 'cutting across a system of lines' whereas fusion is very much about intertwining, braiding and bringing together 'lines' rather than cutting them.

Therefore, the focus is on defining Fusion as a concept:

Fusion is a person-centric approach, equipping the future and current workers with technical expertise that is necessary for success.[7] Fusion brings together different industries and technologies to spark innovation and create economic growth.[8] Fusions skills use interdisciplinary work as a driver for creativity and innovation.[9]

The 12 Fusion Skills were listed previously, but, importantly, 'Fusion' as a concept is not just a set of skills, qualities or outcomes but is a *process*. It relies on close cooperation between schools (education), businesses, the creative and cultural sectors, and further and higher education. 'Fusion' itself means different things to different people and the creative media industries are often defined by differing terms.[10] The hard reality of soft skills is that this is important for what anybody can achieve in life, as well as for the success of our economies.[11] Fusion skills combine arts, design, technology and business, reflecting how future life is transformed by the fusion of these disciplines, generating opportunities for new businesses, products and services. It is the fusion of creative invention and technological innovation which is so distinctive of the UK's Creative and Digital Industries, and which underpins its competitive advantage – particularly with regards to the digital media industries and business.[12]

There are other initiatives[13] underway at the national and international level (also see the Further Reading list in Appendix Four). At the Fusion Cities of the Future event, specific reference was made to the OECD's E2030 programme, the work of the DQ Institute, the Skills Builder Partnership and the ReView self and peer-assessment qualities framework.

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[7] Wallace, T and Barber, A (2013) *Fusion skills: Perspectives and Good Practice* Creative Skillset, p. 16

[8] Creative Skillset, p.21

[9] Siepel, J., Camerani, R., Pellegrino, G. and Masucci, M. (2016) *The Fusion Effect: The economic returns of combining arts and science skills.* NESTA p. 5

[10] Creative Skillset, 2013

[11] Education Secretary Damian Hinds, at the *World Education Forum*, London, January 2018

[12] Creative Industries Council Skillset Skills Group (2012) *Report to the Creative Industries Council,* p. 18

[13] If you are aware of other frameworks or initiatives underway which should be highlighted to the Fusion Cities network, please send details of these to anne.bamford@cityoflondon.gov.uk

6.1 Organisation for Economic Co-operation and Development (OECD): E2030

Education is facing unprecedented challenges - social, economic and environmental - driven by accelerating globalisation and an exponential rate of technological development. Recognising the urgency surrounding the need to reform education, in 2015 the Organisation for Economic Co-operation and Development (OECD) launched the Future of Education and Skills 2030 (E2030) project. The OECD E2030 project is exploring how education systems around the world can prepare students for "jobs that have not yet been created, to tackle societal challenges that we can't yet imagine, and to use technologies that have not yet been invented"[14]. Moreover, it aims to equip children and young people with the skills to thrive in an "interconnected world where they need to understand and appreciate different perspectives and world views, interact respectfully with others, and take responsible action towards sustainability and collective well-being."[15] Phase I of E2030 focused on curriculum redesign and developing a conceptual framework for learning in 2030, while Phase II focuses on curriculum implementation and creating a conceptual framework for teaching 2030.

The OECD's framework for education in 2030 and beyond was presented at the Fusion Cities meeting. It aims to develop structures which encourage students to develop curiosity, imagination, resilience and self-regulation, agency and a sense of purpose, and the competencies they need to shape their own lives and contribute to the lives of others. The aim of the project is working to help countries find answers to two far-reaching questions, such as:

- What knowledge, skills, attitudes and values will today's students need to thrive and shape their world?
- How can instructional systems develop these knowledge, skills, attitudes and values effectively?

This initiative was welcomed as it connects very closely to the Fusion Skills agenda. The participants reiterated their commitment to a future vision for learning based on individual and collective wellbeing. It was suggested that, in order to prepare people to flourish in a rapidly changing world, any framework for future education needs to also capture the concept of lifelong learning as it is unlikely to be learning which only occurs in childhood and only occurs in schools. Participants spoke of the need for a broad and balanced curriculum and how models of greater sharing should inform future education curricula. Participants were also concerned that any reforms highlight accessibility for all students.

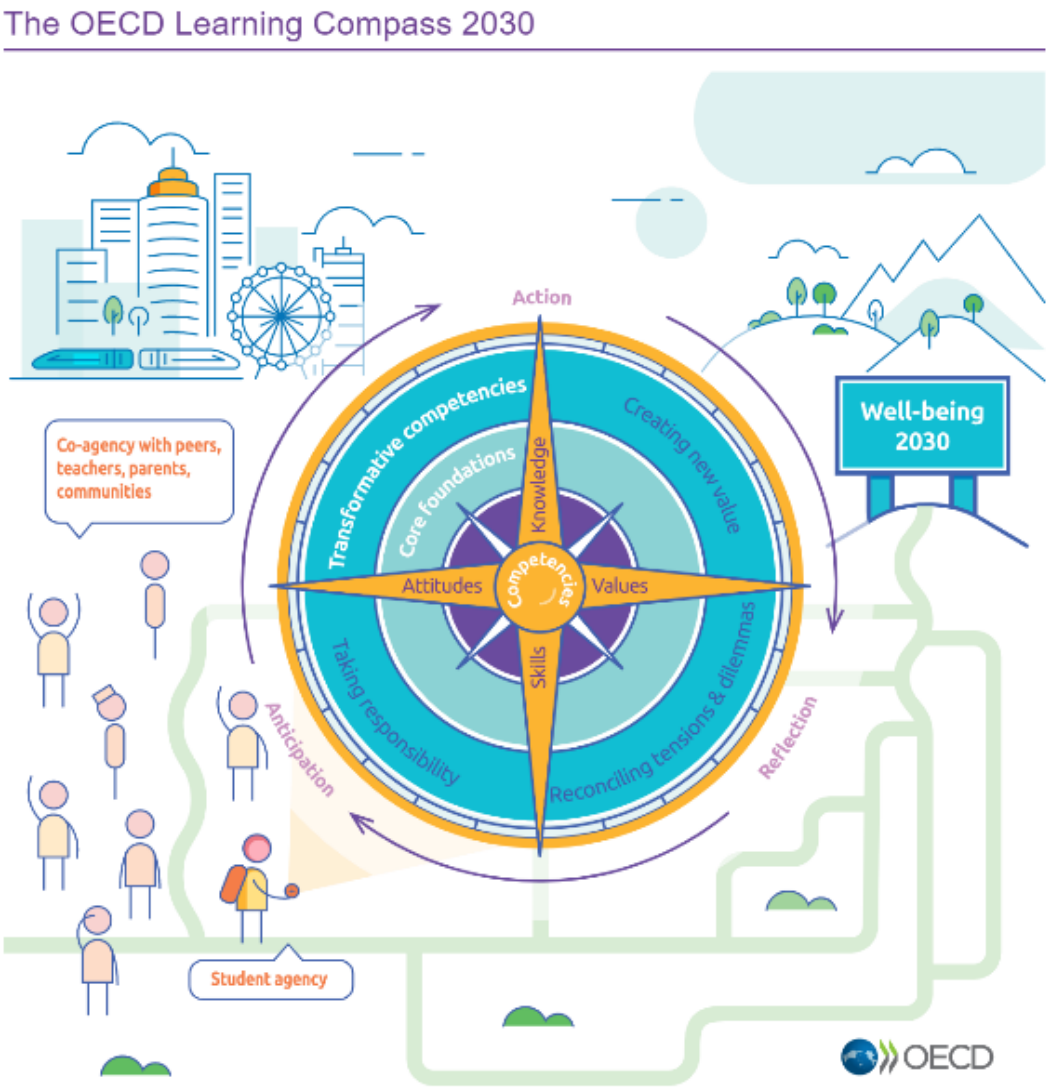
The comment was made that learning needs to be future-focused and prepare people for the workplace of the 21st Century. Suggestions were made that teacher education needed to improve to be able to deliver the vision of E2030 and that the models should also highlight the importance of learner agency, including greater individualisation of learning models and approaches. The model puts children's future learning at its heart, appreciating that this will only be achieved through a high quality and flexible teaching workforce who themselves are open, lifelong learners who possess the skills and knowledge needed for education in 2030

[14] https://www.oecd.org/education/2030-project/teaching-and-learning/learning/

[15] ibid

and beyond. In addition, culture is at the heart of a thriving community, enriching experiences, improving personal wellbeing and providing outstanding learning opportunities. More explicit mention could be made in the model of the role of culture.

The Learning Compass 2030 defines the knowledge, skills, attitudes and values that learners need to fulfil their potential and contribute to the well-being of their communities and the planet.



At a more political level, some criticisms were made of the way the 'PISA'[16] testing process had served to limit the curriculum and lead to less practical activity and less creativity in schools. This impact needed to be recognised in the design of the E2030 programme of activities. It was suggested in a positive way that debate

[16] https://www.oecd.org/pisa/aboutpisa/

and discussions around E2030 could act as platform for sharing and discussion and that assessment tools, resources and continued professional development and learning (CPDL) programmes could be co-designed and gathered to enrich the implementation of E2030.

It was not clear in the model how business had been involved in its formulation and development. The demands of businesses and society more generally are changing rapidly. What you learned in school doesn't prepare you for real work-life situations with adequate skills. To this extent it is important that the framework connects with skills shortages and surpluses and that it models the Fusion Skills and new ways of working. For more information on E2030, please refer to the following website: http://www.oecd.org/education/2030-project/

6.2 DQ Institute

Dr Yuhyun Park presented the work of The DQ Institute (DQI).

The DQ Institute (DQI) is an international think-tank that is dedicated to setting global standards for digital intelligence education, outreach, and policies. Working together with international agencies and local partners, DQI builds multi-stakeholder coalitions that advance its mission and help people worldwide. The DQI is leading the way in coordinating various digital skills initiatives to connect these and to amplify their impact. In her presentation, Dr Park spoke of the potential of the DQ Framework to be a comprehensive and holistic way to assess the digital skills and the "mindsets" needed now and for the future, and it is envisaged that it could become a global standard. For more information on DQ please refer to the following website: https://www.dqinstitute.org/about-us/

6.3 Skills Builder Framework

Tom Ravenscroft[17] presented The Skills Builder Framework[18]. The Skills Builder Partnership brings together educators, employers and other skills-building organisations to achieve a common mission: that one day, everyone builds the essential skills to thrive. This framework is focused on eight 'essential' skills and sub-divides each of the skills into fifteen 'level-based' steps.

The levels, alongside the suggestions for activities related to the skills, provides a clear roadmap to mastery, and so progress is captured and celebrated. The Framework has been piloted with over 300,000 children and young people and has been independently reviewed. The framework has been supported by the Confederation for British Industry (CBI), National Education Union and the Fair Education Alliance among others, representing a cross-section of educators, employers and other youth organisations.

The Skills Builder Partnership is growing rapidly in the UK and is currently being tested and evaluated for extension into use in apprenticeships and the world of work. They are partnering with a growing number of international partners including Teach for All and the British Council, as well as individual schools and

[17] tom@skillsbuilder.org

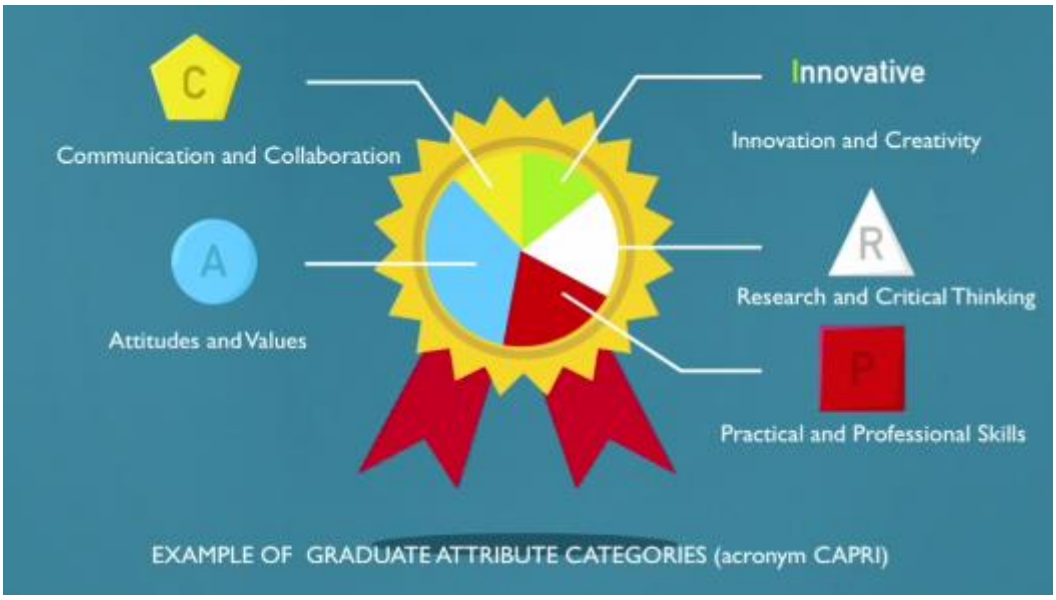
[18] The full Framework can be downloaded at www.skillsbuider.org/toolkit

organisations across the world. This is supported and facilitated by the Skills Builder Hub, giving free access to teaching materials to anyone who wants to build those skills, anywhere.

6.4 ReView

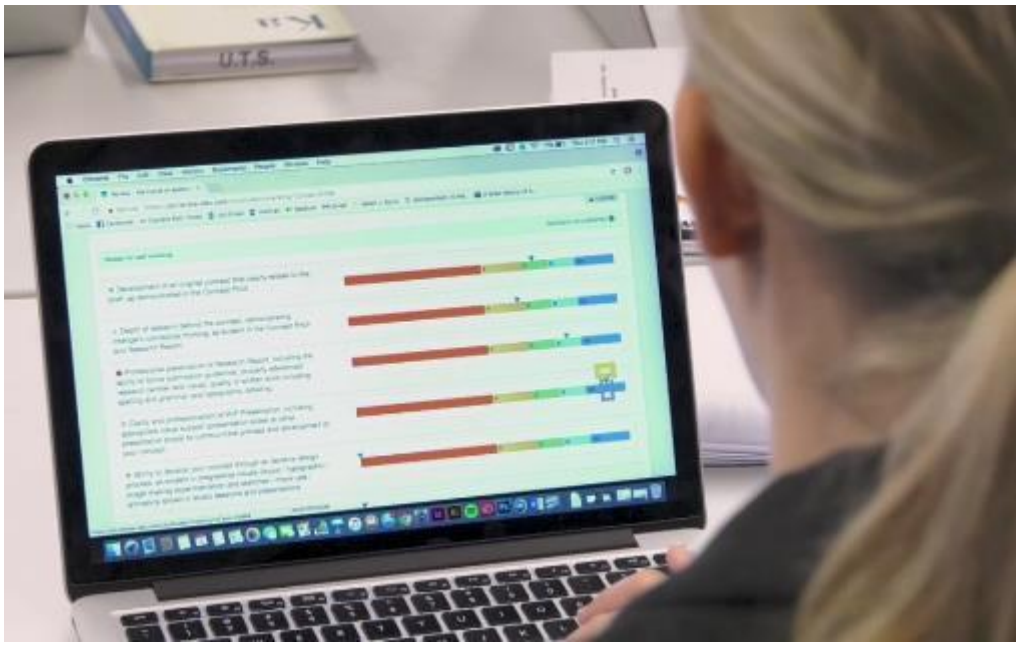
ReView is an online criteria-based assessment tool. It uses broad Fusion Skills, as the basis for generating quality assured self, peer and teacher assessed learning reports and it includes graduate attribute integration. While to date, it has mainly been applied in university contexts, pilot research is underway to determine its applicability in schools.

Whereas there are 12 Fusion Skills, ReView is based around five graduate attributes with the acronym, CAPRI, standing for **C**ommunicaiton and collaboration; **A**ttitudes and values; **P**ractical and professional skills; **R**esearch and critical thinking; and, **I**nnovation and creativty.



REVIEW uses the key concept that assessment criteria are the 'fulcrum of engagement' between markers and students. The two overlapping triangles in the logo are there to indicate that self-assessment compared to teacher assessment on the same screen is a powerful learning feature of the system. The assessment focus for students is guided by richly described criteria with visual grading 'sliders' rather than marks and percentages. The criteria are colour-coded and alpha-numerically linked to capability meta-categories with sub-categories for more granular feedback. Discipline content and capabilities are assessed together using tasks for subjects/projects that give the opportunity for capability development and knowledge application.

Re:View™
online criteria-based assessment



For further information on ReView, please see the following:

- https://youtu.be/_SBZOi5G21A
- https://youtu.be/vR4OfCEVTK8
- https://learning-analytics.info/journals/index.php/JLA/article/view/4888

7. Partnerships and collaborations

Cross-sector collaborations and partnerships are an essential component of the strategy to improve Fusion Skills. The model used for the meeting enabled the identification of models of collaboration that maximize the potential of all participants. These models of working are better suited to supporting effective cross-sector collaborations. Meeting participants argued that there was too much siloed working and that building greater connectivity, would enable access to talent and build an "ideas infrastructure." It was felt that greater connection was needed between public sector 'users' and systems with private sector 'innovators' and small to medium enterprises. Moreover, the public sector had to do more to attract and reward innovation and as one participant put it, we need to be "inventing public sector innovators!"

It was clear during the meeting that for the development of Fusion Skills, no one single sector or organisation can make the speed and scale needed to effectively generate a movement for change, as the following quote from a participant confirms:

> "The challenge we have to innovate is so large that we cannot do it alone."

Concurrently, the skills, knowledge and capacity essential for sustainable change would exist within and across a range of sectors. Therefore, from the outset, it was important that change would occur in a place-based manner (beginning in a single hub or location) and would be amplified through the combined efforts of several key sectors including businesses, charitable and NGO sectors, Higher Education (HEI's), government and policy makers, tech sector, education sector, and the cultural and creative sector, including cultural venues. The combined working and clear vision of these sectors is crucial to affect change. Arguably, over time, more sectors might be involved and engaged in the collaboration, and to a large extent, the timing and extent of this outreach involvement would be influenced by local factors of an area or vicinity. For example, a specific context might also want to involve housing, health, social security, environmental or other sectors as these are relevant.

7.1 Culture and creativity

Diversity, fairness and respect for each other are fundamental pre-cursors to the development of Fusion Skills. To this end, culture is at the heart of a thriving community, enriching experiences, improving personal wellbeing and providing outstanding learning opportunities. Too often though, the cultural institutions in a location might stand somewhat aloof from: the community it serves; the interests of business; adopting new technologies; and, school education. Moving forward, cultural institutions need to appreciate that they are the "gold mines" for the development of Fusion Skills and they need to play a more proactive, outward looking and innovative role in leading work around Fusion Skills. In each of the places invited to participate in the meeting, there was clear evidence that cultural partners were, if not always at the heart, certainly pivotal to the success of the Fusion vision to date. This does raise some questions for the role of cultural partners:

- How do cultural institutions need to change?
- How can they strengthen their work at the local and global level?
- What are the differences (area by area or country by country) about how people access the resource bound up in cultural institutions and creative sectors?

Creativity is in high demand. There is a rapid growth in the creative industries, creative occupations in 'non-creative' company sectors, culture and heritage related fields, and hybrid creative digital industries. The cultural offer and creative animation need to play a central part in the development of Fusion Skills, and it is important that this is reflected in a locality's culture and education planning. Moreover, the broader cultural fields such as media, publishing, film and a range of emerging forms of creative expression should be central to the Fusion Skills training platform within an area. A lot of focus has been historically given to the need to develop scientific and technical thinking, but without culture and creativity this will not develop Fusion Skills. As one participant succinctly recorded:

"Knowledge!! Be careful if we go too shallow. Interdisciplinary learning is crucial, but we need depth. STEAM[19] NOT STEM! "

7.2 Businesses

The Fusion Cities of the Future Meeting provided the opportunity to launch a report developed by Nesta and commissioned by the City Corporation: "Transferable Skills in the Workplace: Key findings from a survey of UK employers" (2019). When assessing the suitability of a job applicant for a new role, employers balance a candidate's job-specific technical skills and experience against other factors, such as their ability to work effectively in teams, communicate with others and solve problems. The latter were referred to in the research using the term 'transferable' skills, although the City of London uses the term Fusion Skills. The results of the research indicated that transferable skills are increasingly important attributes both in the current labour market and for the future of work. For example, "Three-quarters (74%) of employers prioritised transferable skills equal to, or above, technical skills when recruiting new employees." (Nesta, 2019 p11). The most effective way of evidencing Fusion Skills were interviews, tasks and presentations which more closely resembled a real working environment.

"Three-quarters (74%) of employers prioritised transferable skills equal to, or above, technical skills when recruiting new employees." Nesta 2019 p11

These findings were exemplified in comments made by the businesses attending the Fusion Cities meeting. They noted that there was often a gap between the skills needed for the future world of work and society more generally. This was clearly evidenced in the following comments:

"What do employers' value and how are you delivering? How are you engaging business in the design of fusion skills?"

"Gaps in industry - what skills do they need? Skills for wellbeing? How do we plan for contraction? What scope is there for economic growth? Who is the end user?"

"Business cannot thrive with a workforce without fusion skills."

Comments were also made bemoaning the lack of connection between schools and workplaces and that both careers education and work experience opportunities had been reduced. There was also a discussion regarding "the slowness" of the education sector to innovate in terms of curriculum and the exponential growth in

[19] STEAM is Science, Technology, Engineering and Mathematics with the addition of the Arts. STEM by contrast is the same set but without the Arts.

‘content’ but a lack of skills, practice, experimentation and real deep learning in subjects. It was particularly noted that there was a lack of work experience for children under 18 years old.

7.3 Education

As stated previously (Section 5.5) the participants saw an increasing irrelevance of school and the education system as being a major disruptor for the future. Not surprisingly, suggestions for improving education were a focus of the Fusion Cities meeting. Several questions were posed in terms of how education should change to meet future needs. For example,

> "How do young people get fusion skills?”
>
> “How do schools build the dispositions and competencies around independent, flexible work?"
>
> "How do employers and young people work with government to shape the education system?"
>
> “How do HEI's need to change? How can they strengthen their work at the local and global level? What are the differences (area by area or country by country) about how people access higher education?”

Participants made suggestions in terms of how schools and education might change in the future. These included:

- Modular Education
- Changes to Teacher Education and re-training
- Education based on wider conversations within the community
- Redesigning of schools around Fusion, in terms of both structure and flexibility
- Lifelong on learning where the education system is seen to be more like a ‘skills coach’, providing career coaching

In addition to these general suggestions, the participants also proposed very specific changes. For example, it was recommended that oracy should be given an equal status in schools to numeracy and literacy. Moreover, students should be given opportunities to build content vocabulary through discussions and oral presentations and offered opportunities to voice their opinions and make contributions. It was stated that oracy is crucial to all aspects of 21st century life, as the following quote typifies:

> “Children who become effective and confident communicators will become empowered citizens. How we communicate is likely to be the primary judgement of our effectiveness.”

It was also felt that curriculum changes had led to a devaluing in schools of other Fusion Skills. In schools the amount of time allowed to foster a child's curiosity and to develop creativity had substantially reduced. There was an overwhelming call for schools to be more creative. One participant suggested schools should be based around "The 3 I's" I:Intrigue | I:Intuition | I:Independence." Another group proposed the view that schools should be:

> "Digital, adaptive, and creative. Flexible education = the future. The arts build freedom + individuality. We need more open options. New forms of educational adaptability - Soft/fusion. Creative/interpersonal skills."

Some participants felt that it was the politics of the education system which needed to change in that there needed to be a shift in power structures to give more of a voice to pupils. This is evidenced in the following plea:

> "Hand power to the learner! Empower the learner! Provide resources - make them over-visible."

The view was also expressed that the school and education system had not kept pace with the sorts of radical changes effecting how people live and work, especially in terms of the changes engendered by the pervasive use of technology. One group proposed a model of a school for the future as being a place where there was:

> "Smart working! Public vs private? -> Anticipatory. Innovations & Evidence. Challenge -> Collaborators! Play workers, artists, scientists. Great teachers! Fun space and other fusion skills. Teamwork!"

Those participants working in education identified challenges in measuring pupils' performance and in the funding available to take a Fusion approach to education. As a result, schools tend to still adopt a 'one size fits all' approach and that this is no longer relevant. Schools should be about engagement, self-esteem, social skills, applicational creativity, goal setting, problem solving, teamwork and collaboration. They need to be places where people build relations, preparing learners for the jobs and lifestyles of the future focused on behaviours, attitudes, and competencies. The ability to learn is more important than prior knowledge. It was suggested that the answer might lie in greater involvement of business and professionals in the school environment, with support for programmes involving; 'learning by experience', 'workplace learning', 'artists in residence' and so on. However, a cautionary note was also struck with the following comment: "Modelling + Education = Unintended consequences + loss of cultural sensitivities."

Schools should focus on raising education equality and aspirations, but currently, the curriculum is overcrowded with too much content which places the teachers under pressure to focus on delivering content, rather than building skills, ways of thinking and conceptual knowledge. As the following question challenges:

> "What should young people in your city be learning less of, or doing less, to make space for the development of 'fusion skills'?"

While acknowledging that the design of the school curriculum was a major factor in the inability of teachers to focus on fusion skills development, there were more general criticisms of teacher education and workforce

development. Without high quality and skilled teachers, transformation of education was unlikely, as summarised in these comments:

> "The model puts children's future learning at its heart, appreciating that this will only be achieved through a high quality and flexible teaching workforce who themselves are open, lifelong learners who possess the skills and knowledge needed for education in 2030 and beyond."

> "<We need> Dynamic teaching, attitude change and agility."

Suggestions were made that both technology and the skills within the business sector could be more effectively deployed to boost the effectiveness of teachers. For example, businesses could develop and provide "real world, quality-controlled resources/to complete teaching." Also, businesses might help lead the way in developing better measurements of Fusion Skills for use in schools and to provide additional funding for schools tied to the development of Fusion Skills. It was acknowledged that in most of the economically advanced countries there was a teacher shortage and teachers were not generally adequately prepared as a future profession. For example:

> "**Only 30%** of teachers are qualified to teach **computer science.** Teacher education should be modelled around hackathons. We need teachers to develop the fusion skills and we should celebrate the time it takes to develop a good teacher. Undergraduates want to pass quickly. Secondary teachers are worried about what and who they are, and this leads to anxiety. Primary teachers are generally on it. They make learning more dynamic. How can we use the skills in primary teachers to rollout fusion skills-based learning in the secondary schools?"

The Teachers Inspiring Lifelong Learning (TILL)[20] project is focused on developing a Lifelong Learning European qualification for teachers at all stages of their careers. The project began with investigating the current conditions of initial teacher education (ITE) and continuing professional development and learning (CPDL) across all the European Member States, and some aligned states, including analysing how these existing programmes do, or do not, prepare teachers with the competencies needed for future education and/or build the desire amongst teachers to be lifelong learners to gain these future qualities. The research to data shows that, except for a few countries (Finland and Ireland), very little attention is being given to the lifelong learning of teachers. There is a lack of recognition of the importance of the development of Fusion Skills and the programmes are largely based on subject knowledge and behaviour management.

There was also the view that school could no longer be something that people attended between the ages four and sixteen, but rather that education would have to be a lifelong undertaking. It was acknowledged that a continuous learning mindset will determine future success, as can be seen in this selection of quotes:

[20] http://www.till.org.uk/

> “We will need continuous learning. Learning how to learn. Fostering of skills that increase innovative and creative youth… Play and research. Exploration. Stop talking 'teaching' and start talking 'learning'."

> "Greater focus should be given in lifelong learning to the sequential and explicit development of transferable skills."

Education systems should be proactively and deliberately designing progression models and engaging adult learners in culture and skills development. It was felt that there was a growing disconnect between the preparation received in schools and the graduate attributes needed for university. Reflecting the theme of lifelong learning, participants were of the view that the pathways into university had to give more attention to Fusion Skills. People are becoming more international in their focus and there needs to be a more universal approach to university recruitment, with less reliance on local test systems. For example, one group mentioned the potential value of the *Unifrog*[21] approach to open university selection and placements.

8. Leadership

Leaders for the future will need different skills and capabilities. There will be less of the models of traditional leadership which characterised the industrial revolution, where workers were being led by a manager who had total authority. "Top down" type of leadership places managers at the top and the workers at the bottom rung of power. Managers make decisions on the work and issue orders or directions for how the work is completed. Participants felt that leaders for the future will need to be more “guides of change”. Power will not be held by an executive or executive board but rather more autonomous control of self, such as self-managed, self-assessed, self-regulated and so on. More progressive organisations are already starting to approach management differently. For example, Netflix, Crimson Hexagon and LinkedIn are part of a growing group of companies that offer unlimited vacations, trusting the autonomy of staff to manage their tasks and projects, and to structure their time according to what needs to get done.

Needing to manage differently is not just in terms of the relationships with employees. Participants suggested that it was likely that there would be more data-driven decision making, using digital intelligence. While bosses using ‘big data’ may sound a bit ‘big brother’, the overwhelming view was that leaders would need to demonstrate more empathy, social intelligence, integrity and be better at convening broad alliances. As one respondent summarised it, leaders of the future will be, “emotional and adaptable”. There was also the view that leaders could play an important role in ‘coaching’ people in the development of the Fusion Skills as these quotes suggest:

[21] *Unifrog* is a universities’ destinations platform. It enables students to compare every opportunity, and then apply successfully. It is also a useful site for teachers and careers guidance to assist in managing the progression process. https://www.unifrog.org/

> "They will be visible leaders. Understanding our end goals. They will be coaches of IQ/DQ, EQ and AQ."

> "They will be life coaches and co-designers. In sports you can easily get a Personal Trainer (PT). Who is your career/life PT? Who can provide you with the tools to be used at crisis points… and in our lives?"

The notion of a "hero leader" seemed out of step with what was needed for the future. While it was acknowledged that, to bring about change, 'champions' and 'enthusiasts' are needed to increase early adoption of Fusion Skills and to create examples of innovative practice, these people will be communicators, networkers, convenors and amplifiers rather than being 'white knights who can solve any problem or challenge'. At the core of leadership for the future will also be the Fusion Skills, especially good communication, creativity and collaboration (the so-called 3Cs). This focus is apparent in the following questions:

> How are you collaborating with other cities?
>
> How are your politicians helping/not helping the city get ready for the new world?
>
> What does global government look like?
>
> Where does leadership reside and how are these future (skills) fusion needs get promoted?

9. Assessment of Fusion Skills

While the meeting largely agreed with the importance of the Fusion Skills and the list of the 12 identified skills, it remains a challenge to accurately assess and measure the development of these skills. Based on the Nesta[22] study (2019), the employers involved in the study found it challenging to accurately assess transferable skills. The report concluded that more research is needed on the most effective ways to assess transferable skills in job applicants. The research also urged that "schools, businesses and government should work together to develop effective tools for measuring, recording and reporting the development of transferable skills." (ibid, p 6). It concluded that existing assessment methods are largely ineffectual in determining if a person has good transferable skills. In fact, mechanisms such as CV's, references and exam performance were not considered to be effective at all. By contrast, interviews and activities which replicate a real-work scenario were seen to be the most helpful. The topic of how to assess and report the development of Fusion Skills became a focus of discussions. Attendees underlined the importance of oral communication, significant experiences and tasks in assessing transferable skills. It was also suggested that learners of all ages needed training and development in being able to accurately perceive self-efficacy – in other words, being capable in lifelong, self-assessment. There was cross-sector agreement that both education and employers need to radically and rapidly change

[22] Nesta (2019) *Transferable Skills in the Workplace: key findings from a survey of UK employers.* City of London, UK https://www.cityoflondon.gov.uk/services/education-learning/schools/Documents/transferable-skills-in-the-workplace.pdf

what is valued, and that there needs to be greater focus on what one participant called, "Education beyond exam results!".

The criticism was made that there are too many 'lists' and that these are often overlapping or poorly understood. As one participant described it, "93 lists. How do you assess this? We need a clear competency framework." Participants saw a range of potential models of assessment including DQ, ReView and Skills Builder to name just a few (see earlier sections). While these tools provided valuable frameworks, the key feature of all the successful assessment tools were that they not only measured the acquisition of Fusion Skills, but importantly, they embedded in their design meaningful project experiences for the learners. In each case, these were graded in some way or offered developmental markers. The tools focused on slightly different sets of Fusion Skills and while the terminology or the exact number of skills included in the test may have varied, it could be seen easily how they covered the main 12 Fusion Skills. DQ suggested a space for the sharing of online assessment tools to provide a rich source of potential tools and to enable greater access and sharing. It was acknowledged that the tools to date had taken slightly different focuses and were designed for slightly different ages and purposes but that as a complete set, there were considerable resources already emerging which could be used to accurately and reliably assess Fusion Skills at all levels of education, learning and employment.

As a result, a taxonomy mapping exercise is underway to overview the Fusion Skills assessment tools which are available and the skills they assess. The aim of this mapping exercise is to create an environment around assessment which could enable a comprehensive 'bank' of assessment tools to be available and accessible - and through self and peer review, continue to grow and enhance the quality of these tools. It is also the intention of the mapping work to create a clear overview and linkage between various skills (and the language used to describe them) and to identify where tools already exist to assess these skills and where there are gaps, and so future developers can align their efforts to these areas. As one participant accurately noted of the need to clarify both the skills themselves and the tools to assess and report them:

> "Fusion skills… or ConFusion: Clarify… how to disrupt the inertia of exam-led education."

> "Learning by experience. We are in a trade fair for the enclosure of knowledge evaluation… fusion dispositions."

10. Presenting the cities

The Fusion Cities of the Future event aimed to bring together cities, or parts of cities, where there is a distinct ambition underway to work across sectors to develop and expand Fusion Skills. The cities chosen already have clear evidence of education, business, HEI's, NGO's and charities and the tech sectors working together to tackle some of the 'disruptions' impacting on the design of education, learning and skills systems. In the initial year, the attention was focused on cities in Europe and the United Kingdom who were working in this way.

Deliberately, ‘smaller’ cities and regions and parts of cities were chosen instead of large metropolis areas. This was because it was felt that sometimes change can rapidly occur and be more collaborative and cross-sectorial in these smaller centres. The aim was that the initially invited cities would form a nucleus, not only for the next meeting to happen in 2020, but also for actioning the ideas emerging from this meeting. The cities hosted a panel session and enriched the various discussions and perspectives that emerged throughout the day. The cities had approached differently the task of implementing Fusion Skills. For example, some innovations were led at a political and policy level through local government actions. In other instances, Higher Education (HEI) partners had driven change. There were also examples of cultural institutions or businesses being the catalyst for new ways of working. Most of the cities were not treating ‘change’ as a project nor did they have extra specialist funding to make their changes. In most cases, they were continuing their usual business but looking at new and innovative ways of being more effective, having greater impact, and positively changing the community and environment of their city. This diversity of approaches and lack of an ‘additional’ resource base is a real strength as it means that the cities are not doing something ‘extra’ but rather are fundamentally changing the way they do everything.

The following brief reports from each of the cities involved gives a flavour of the ways they are approaching Fusion Skills at the local level. By including these in the report, it highlights the concept underpinning this movement of having a broad and ambitious global vision for Fusion Skills, and yet acting and interpreting this vision at the local level to enhance the lives and opportunities of the local community. It is based on the idea of an international movement for change but equally on the importance of a strong sense of the 'local place'. There is a focus on local ecology and character to build flexible and responsive action. This is supported through partnership and community engagement opportunities. The following questions framed the discussions:

What does your city do well?

What are you looking for help with?

How do we share models that work?

How can we prioritise people who have faced barriers?

How do we identify gaps and set about to fill them - including policy and planning?

The following sections present the approaches taken in each of the cities from the perspective of the attendees from those cities at the Fusion Cities of the Future event.

10.1 Bamberg, Germany

In Bamberg, we follow the vision to enable the children of tomorrow to learn transferable and Fusion Skills which prepare them for thriving in an increasingly diverse society. The University of Bamberg is today training those teachers who are going to teach these children. What do those teachers need? Surely more than the traditional content of the academic disciplines and educational sciences! They need cultural competence in the broadest sense of culture – and here we follow Clifford Geertz's[23] view that culture is man-made, constructed and changeable. For teachers to code and decode it, they need a large set of skills, and prominently among them, Fusion Skills: flexibility, readiness for uncertainty, multiperspectivity for being able to collaborate with each other and to solve problems. For this, innovations in teacher education are necessary – and the support from practitioners and experts from businesses, the arts, policy makers, and others.

A city like Bamberg, with its 77,000 inhabitants, is just large enough to offer many of those experts – and just small enough to find them and to motivate them to cooperate in such a common vision. There are, of course, obstacles to such an enterprise: resources are small, structures are fixed and bureaucratic, the political willpower to move things depends on individual persons and personalities.

[23] Clifford Gertz (1926-2006) view culture as being developed by people themselves. He described culture as being "a system of inherited conceptions expressed in symbolic forms by means of which men <sic> communicate, perpetuate, and develop their knowledge about and attitudes toward life." Geertz, Clifford (1973). The Interpretation of Cultures. Basic Books, p. 89

At Bamberg, both the city and the university are currently in the comfortable position to have temporary funding (or at least an unfaltering will) for supporting new networks. The University project “culturePLUS”, now starting its fourth year, invests manpower and energy to connect experts and to establish culture education skills in teacher training. The coordination of educational and cultural projects is part of the administrative and structural work of the local government.

10.2 Bristol, UK

In Bristol, Bath and the West of England we are building on our high-tech, creative and smart capabilities to imagine the future *Smart Internet*. We see the Smart Internet as a cornerstone for developing the thriving cities of tomorrow. A hybrid or ‘fusion’ of utility and creativity, the combination of Smart Internet and creative communities will power our future innovation ecosystem. This ambition is fully embedded in our Local Industrial Strategy and through targeted investment in the innovation ecosystem, and in particular, Science, Technology, Arts, Engineering and Maths skills (STEAM). Alongside a regional network of Living Labs, we seek to develop a world-class Research and Development (R&D) infrastructure that will enable large and small businesses, universities, local and regional government, artists and local communities to co-design, test and scale the products, services and in time, the behaviours which cities of tomorrow will rely upon for clean and inclusive economic growth.

Context

Digital connectivity is understood to enable cross-sector collaboration and engineer creative collisions (something the West of England recognises as a distinctive strength). Local and Regional Authorities in the West of England have worked with government, telecoms and other industries, academia, SMEs and both cultural and community partners to successfully lead delivery of a series of high-profile strategic and tactical interventions aimed at bringing forward investment in digital infrastructure. This, combined with significant investment in business start-up and scale-up programmes and social and digital inclusion, has accelerated innovation and enabled business growth far in excess of what might have been expected otherwise.

Crane Dance Bristol : Jon Rowley
Layered Realities : Paul Blakemore

Beasts of Balance : Sensible Object
Mekamon : Reach Robotics

Playable City Shadowing : Farrow Creative

The Future Smart Internet

In partnership with the University of Bristol's Smart Internet Lab, local partners are creating and testing the Future Smart Internet to surpass what can be achieved with today's level of connectivity. We imagine a Smart Internet that has no latency, supports dense levels of connection and is programmable. The Bristol Smart Internet will:

- Connect millions of people in real-time with no perceptible delay or loss of quality;
- Seamlessly connect millions of devices and objects per square meter, allowing for deep levels of interaction;
- Break down silos formed by proprietary devices and networks to guarantee shared immersive experiences at mass scale; and
- Bring the capability to effectively balance the needs of all city users, for example, maintaining connections for critical services as well as allocating bandwidth for creativity and culture.

In summary, the Bristol Smart Internet will blend the utility of our Smart City (ranked by Huawei and Navigant Research as #1 in the UK) with the creativity of our global Playable City, which re-uses city infrastructure and re-appropriates Smart City technologies to create person-to-person and person-to-city connections. The result is a truly hybrid or 'fusion' space – a Smart Region where our innovation ecosystem lives and thrives; where Arts skills are embedded within STEM to create STEAM skills; and clean, inclusive economic growth is achieved. The partners include, Crane Dance Bristol (Jon Rowley), Beasts of Balance: Sensible Object, Playable City Shadowing: Farrow Creative; Layered Realities (Paul Blakemore) and, Mekamon: Reach Robotics.

10.3 Dundee, Scotland

Dundee is a small, post- industrial city, situated on the mouth of the river Tay on the east coast of Scotland. In previous centuries, it enjoyed a position as a global hub, at the heart of a textiles and ship building industry. These industries moved on, and the manufacturing industries fell slowly into decline. Dundee's current workforce is primarily comprised of public and service sector roles.

Dundee has two universities, a strong creative industries sector with leading digital and games companies, and a thriving life sciences and healthcare sector. The city has embraced an ambitious culture-led regeneration programme which has succeeded in supporting our nationally important agencies including Dundee Centre for Contemporary Arts (DCA), Dundee Rep, and Scottish Dance Theatre, as well as our new flagship building, the V&A Dundee. This cultural ambition led us to achieve our designation as the UK's first UNESCO City of Design in 2014.

The V&A Dundee is at the heart of a £1bn development for the Waterfront. The city is embracing its potential and is undergoing an ambitious period of change - with the Waterfront regeneration as a catalyst. As part of that Waterfront development, Dundee is also the UK's Creative Cluster for Innovation in Games and Media Enterprise (InGAME), supported by multi-million pound investment from the UKRI Arts and Humanities Research Council and the Scottish Funding Council. InGAME is a partnership amongst Dundee's universities and the University of St Andrews in collaboration with local, national and international games companies together with business and cluster development organisations. InGAME mixes creative arts and STEM to exploit technologies and analytics to deliver new products and services.

However, behind the good news stories, we are still a divided city, and the city's boundaries include areas listed on the Scottish Index of Multiple Deprivation[24]. We have work to do to develop our mainstream education which still has poor outcomes.

We welcome the recognition of the Fusion Skills in NESTA's research and can see that many of these skills gaps are being addressed through the Scottish Curriculum for Excellence[25]. In Scotland we also measure our work against the National Performance Framework[26] which is aligned to the United Nations Sustainable Development Goals[27].

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[24] The Scottish Government's tool to identify areas of multiple deprivation in Scotland

[25] https://education.gov.scot/scottish-education-system/policy-for-scottish-education/policy-drivers/cfe-(building-from-the-statement-appendix-incl-btc1-5)/What%20is%20Curriculum%20for%20Excellence?

[26] https://nationalperformance.gov.scot/

[27] https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Our current city challenges are to understand how we share the success across all areas of the city, how we can help retain talent in the city and develop the gig economy through teamwork, resilience and collaboration.

10.4 Eindhoven, Netherlands

Eindhoven is a base of creativity. The city of Eindhoven is the fifth largest city in the Netherlands with 230,000 inhabitants. It is the centre of an industrial region where high technology and innovation flourish. The region is known as one of the smartest regions in the world because of the high number of patents emerging from the area. 'Light' is a very important element throughout history: from matches in the 19th century, bulbs made by Philips in 20th century, to photonics in chip industry and cars on solar energy in the 21st century. Successful innovation resulted in many new products which are sold nowadays throughout the world. This led to prosperity and development of the city, and to a necessity for cherishing creativity as one of the basic skills.

Cultural sector and educational institutions collaborate in the Netherlands on a permanent basis. There is a national programme co-financed by the Ministry of Education, Science and Culture and cities, which ensures that artistic content is offered in the primary schools in collaboration with cultural institutions and individual artists. In the region of Eindhoven various learning lines were developed, from music to design and digital arts. As an innovation region, we stimulate cultural organisations to take a lead and develop new products for schools. For example, the programme *Creative Code* is about digital arts. This cross-disciplinary programme about imagining the future has just finished the pilot phase with schools in the city. As an industrial region, we need new technical talent, so there are many projects and events combining creativity and technical skills too. Focus on creativity and technology in businesses means that also when educating the children, these two elements get extra attention and effort.

As the cultural agency of the city *Cultuur Eindhoven*[28] conducted a research on creativity among the children in primary schools last year. It proved that exploring complex problems and learning using artistic skills, stimulates all aspects of creativity. With a scientific definition of creativity in mind, a survey has been developed mapping the necessary skills. The research was an attempt to make a tool for teachers on how to observe and stimulate creativity as a Fusion Skill. Currently we are investigating the possibility to provide it as an accessible tool for schools and businesses.

The cultural sector in Eindhoven is characterised by a strong presence of designers because of the Design Academy which is widely known. With Dutch Design Week, a ten-day festival, we have a manifestation where design, educational institutions (from schools to a cooperation of Dutch technical universities and Design Academy), cultural institutions, businesses, new technology and government bodies come together. Dutch Design Week is a platform to address several challenges and problems we must deal with as a humanity, to show new trends and new generation of designers, to connect business, educational institutions, governmental bodies and designers/artists and to offer an unforgettable experience to more than 300,000

[28] https://www.cultuureindhoven.nl

visitors. With this strategic position, Dutch Design Week is also making innovation accessible and acceptable to a wide audience. To quote one of the Board Members of ASML[29], a globally known producer of chip machines: 'Technology makes it possible, design makes it acceptable.'

10.5 London East Bank: Foundation for Future London, UK

London East Bank is the former site of the 2012 Olympic Games hosted in London. It is now being developed as a hub for innovation bringing together education and cultural institutions, new and emerging technology and creative industries alongside housing and urban regeneration. Foundation for Future London (FFL) is fundraising to invest in jobs, training, entrepreneurship, learning, mentoring and business opportunities for the East Bank local communities of Newham, Tower Hamlets, Hackney and Waltham Forest.

To aid engagement of Fusion Skills across the East Bank partnership, Foundation for Future London (FFL) has partnered with Culture Mile Learning (see Section 9.6) to launch the Fusion Prize – a new competition to find innovative ways to upskill future generations empowering them to meet the demands of today's employers (see section 10.1 for further details). Culture Mile presented directly to East Bank's Creative Content Group to raise understanding and awareness of the value and importance Fusion Skills. East Bank partners are developing upcoming programming to amplify the Fusion Prize. East Bank partners are part of the ongoing engagement in content delivery across the Prize's events programme. This is amplifying conversation regarding skills development and creative learning.

FFL will be leveraging further funding opportunities to address:

a) Local Programming/Engagement: FFL and Culture Mile Learning appointment of local experts to the Fusion Prize judging panel to support relevance and engagement of the Fusion Skills agenda across east London. FFL will commission local partnerships to deliver additional inspiring projects prioritising, Fusion Skills, innovation and value of creativity.

b) Continuing Professional Development: Continued partnerships via the *Creative Schools* platform to deliver and extend CPD programme for teachers to enhance creative learning across the curriculum. As Dr Lucia Yandoli from Creative Schools commented:

> "Creative Schools can offer more teachers the chance to explore their own creativity and pass these skills and passion on to the next generation. We can broker exciting creative projects that meet a real need in schools. This year we are bringing more poetry, design thinking, creative-problem solving, film and dance projects into classrooms across east London to inspire the next generation."

c) Geographical and strategic partnership: Collaboration with specific local authorities and networks to connect with local orgs, education and cultural sectors. The Fusion Prize has provided opportunity to

[29] ASML is an innovation leader in the semiconductor industry, mass producing patterns on silicon through lithography https://www.asml.com/en/company/about-asml

expand reach with local networks such as New Creative People & Places consortium, Hackney Wick & Fish Island (HWFI) Cultural Interest Group, HWFI Creative Enterprise Zone etc.

d) Youth Leadership: Involvement in young people within planning and programming e.g. Co-designing 'STEP into Comfort Zone' programme of workshops, networking, talks at Great Get Together Festival.

e) Professional Development: Develop and embed leadership skills via internship opportunities such as 'STEP into the Smithsonian' internship / international exchange: "Investments in culture and creative opportunities around East Bank are really empowering; they literally alter how you interpret and appreciate such a globally important and unique city, which is easy to take for granted when you're caught up in trying to get by in a place you otherwise just know as home." Abondance Matanda from STEP Into Smithsonian.

10.6 Culture Mile, London UK

Culture Mile[30] is a new cultural district - a corner of London's working capital, where creativity is fast becoming the most valuable currency, and where two thousand years of history collide with a cluster of world class cultural organisations.

The City of London Corporation, together with the Barbican, Guildhall School of Music and Drama, London Symphony Orchestra and the Museum of London, are leading the animation of the neighbourhood between Smithfield and Moorgate with imaginative collaborations and events.

The completion of Crossrail's new *Elizabeth Line* will forge new transport connections at Farringdon and Moorgate and make Culture Mile the most central part of Greater London. In this place, Culture Mile aims to bring commerce and culture together in an alliance that will transform this part of the urban landscape, and draw upon a wealth of creativity – where known meets unknown, and ancient and modern collide as the streets are activated by exhibitions, gigs, pop-ups and events.

Alongside the five founding partners, Culture Mile is growing an extensive network of organisations across the civic, commercial and cultural sectors that will play a role in realising the districts long-term ambitions. From property sector to legal firms, from universities to the City's unique Livery companies, these organisations represent the changing face of the City of London and share a deep-rooted commitment to transform the area.

Culture Mile also forms strategic partnerships beyond its boundaries. It is working with East Bank (see section 9.5), a major new cultural district being established in the Olympic Park in East London, backed by the Greater London Authority, on shared projects.

[30] www.culturemile.london

Culture Mile Learning brings together 27 organisations, across the City and beyond, to work together on an unprecedented scale to build Culture Mile as a world-class learning destination. Culture Mile Learning specialises in the fusion of the creative, interpersonal, problem-solving and digital literacy skills needed by today's employers, and – as well as the learning departments of the district's founding cultural partners – it includes a diverse range of venues and organisations including Keats House, St Paul's Cathedral, Tower Bridge and Epping Forest.

In 2019-20 Culture Mile and East Bank are working together to deliver the Fusion Prize (see Section 10.1), a 'challenge prize' that invites innovative solutions that will support the development of Fusion Skills among London's young people. Harnessing a diverse community across education, tech, social innovation, arts and creativity, the winning solution will be awarded £50,000 in May 2020 to deliver and scale their idea.

In the City of London, this activity happens in a place where Culture Mile's research has revealed a rate of growth of workers in creative roles of 88% between 2010 and 2016 – double the London average over the period. The City of London's creative strengths are developing faster than anywhere else in the UK, and creativity is in high demand in financial services, across the rest of the commercial sector and from the general public who wish to engage with culture and creativity on an everyday basis. Culture Mile is seizing a once-in-a-generation opportunity to harness the area's mix of sectors, infrastructure, connectivity and access to talent to establish the cultural district as a hub of creativity, enterprise and innovation that delivers economic growth and social mobility for London.

10.7 Nacka, Sweden

As the first municipality in the country, Nacka introduced customer choice for cultural schools on June 18, 2018. This entails a wider range of cultural courses for children and young people provided by entrepreneurs during leisure time. Today we have 14 authorized cultural schools that offer over 1100 courses in music, theatre, dance, circus, art, media and creation. How does it work:

- Larger range of cultural courses in leisure time for children and young people 7-19 years who are residents in Nacka.
- A common catalogue on the homepage of all cultural schools, www.nacka.se/kulturskolor
- The municipality determines the term fee - the same fee for the same type of course.
- A cheque from the municipality to the cultural schools for each student location.
- Exemption from fees in case of granted support.
- Evaluated by customer surveys and collegial observations.

Nobel mountain (Nobelberget) – blocks for culture, creativity and living

Nobelberget[31] is an old industrial area in Nacka which is now changing into an area for culture, creativity and living. The partnership between the Municipality of Nacka, the real estate developer, Atrium Ljungberg and the creative industry has occurred from the very earliest conception of the plan and through the whole period of planning and preparing for the transformation. By organizing festivals and cultural co-working hubs the content in the area has been created before the actual new houses. This has created value for the people of Nacka, cultural industry and the marketing of the new area.

Vercity

Vercity[32] represents an ambition to develop a new concept for learning and interaction between stakeholders within education and business. Vercity is created in partnership between education, the municipality and business. The goal is to open a new location for learning within the coming ten years, but we have already started to develop content. For example, to initiate the project we are already organising talks on the future of learning, opening a testbed for edtech, and addressing teacher training.

10.8 Newcastle, UK

Newcastle is one of the North of England's great cities, that was at the forefront of the first industrial revolution and is positioning to play a leading role in the fourth. Newcastle is a city of bright sparks and big ideas. Fusion Skills – innovation, creativity and adaptability – are at the heart of our approach, even if we have not previously called them that. Our Newcastle's transformative approach is visible in the heart of the city:

[31] www.nobelberget.se

[32] https://www.nacka.se/stadsutveckling-trafik/har-planerar-och-bygger-vi/nacka-stad/vercity-en-plats-for-larande/

- In Stephenson's Quarter, where the first ever steam locomotive was designed and built, that is now home to growing tech companies, Boiler Shop[33], one of the UK's top ten cultural venues, and NEFutures UTC, a 14-19 technical school led by a university and business working together, focused on technology and life science skills.

- On Newcastle Helix[34], once home to the brewing of Newcastle Brown Ale, now a booming technology hub, home to hundreds of small companies, thousands of students, the National Innovation Centre for Ageing and another for Data that is leading the way in engaging businesses from Facebook to start-ups in data analysis and manipulation to provide new services in secure ways.

- Around Pilgrim Street, a part of our retail core undergoing transformation as city centres change their function from being about what you can buy there to being about what you can do there, which has unexpectedly become full of a vibrant mix of small start-ups in shared spaces – artists, voluntary services, designers, coders and makers feeding off each other in all sorts of creative ways.

Our Universities have embraced Fusion Skills as a way of working – Northumbria and Newcastle Universities in the city are ranked 1 and 4 in the UK for creative start-ups, contributing to Newcastle being the UK fastest growing tech sector hub outside of London. All the region's five Universities collaborated to deliver Creative Fuse[35], supporting business growth through the application of Fusion Skills, knowledge and innovation.

Our schools are picking up the baton of Fusion Skills, supported by our Local Enterprise Partnership, the North East Ambition project is working with schools to strengthen the careers guidance and employability advice that young people receive.

In Newcastle, the Adult Learning teams received very positively the idea and the language around Fusion Skills and are keen to try it out. We have been working on a replacement to our Individual Learning Plans for learners to try to help them to better understand the journey they are and have been on. We are calling this My Learning Journey and it will be in various forms across the service for different types of learner. However, all versions will meet an agreed set of standards. Some teams have decided to try to find ways to record development and progress against the Fusion Skills in the My Learning Journey document. They are keen to see where this takes them and the learners and to test out how best to do it. This comment from the Senior manager of Adult Learning effectively captures the positive response in Newcastle to Fusion Skills:

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[33] http://www.boilershop.net/events

[34] https://newcastlehelix.com/

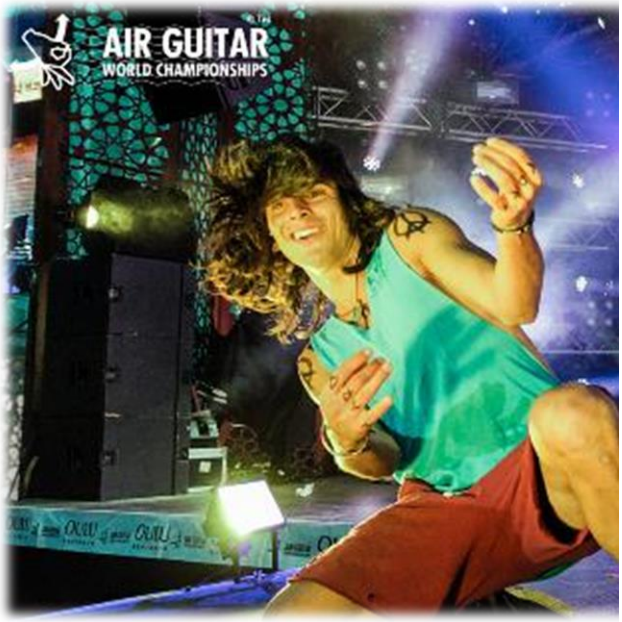
[35] http://www.creativefusene.org.uk/

> "I thought that there would be some enthusiasm but was surprised by the speed at which the first manager came to me to say they would like to try some things out."

We have had very positive discussions of our next steps on Fusion Skills and are looking at how we can adopt and embed them across our spheres of influence. As part of this, we are planning to organise an event to 'socialise' the concept in Newcastle and its environs with schools, colleges, and employers and so on.

10.9 Oulu, Finland

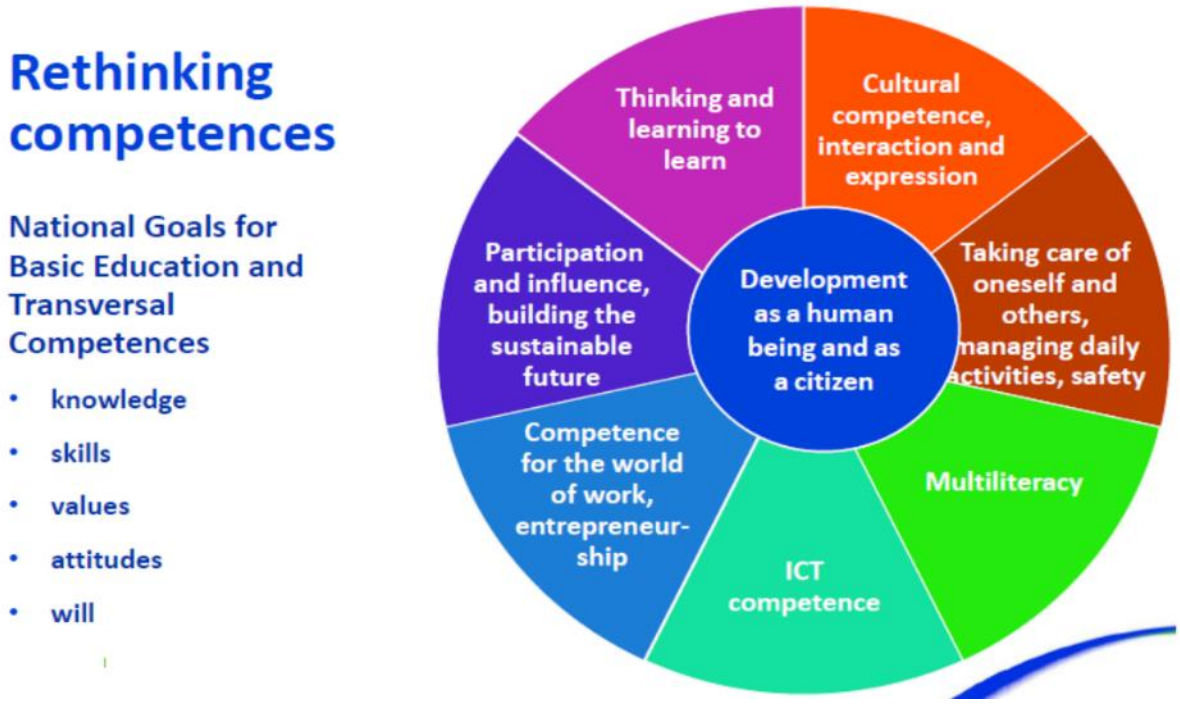
The Oulu region is home to 250,000 people. Oulu is one of the oldest cities in Finland, but it has one of the youngest populations with an average age of just 36.2 years. The city is located about 6000 kilometres to the north of Helsinki. More than 600 high tech companies are based in Oulu. It has one of the world's first 5G hospitals and each year hosts more than 50 congresses and cultural events. One of its more unusual events is 'Polar Bear' pitching, where budding entrepreneurs pitch their business ideas to venture capital funders. The lengths of the pitches are necessarily short because of the temperature of the water! The Air Guitar world championships also occur in Oulu!



The Finnish school system offers equal educational opportunities to everyone irrespective of domicile, gender, financial situation or linguistic and cultural background. The culture education plan operates across the entire curriculum. It guarantees that all children and young people have an equal possibility to experience and participate in local culture in a diverse manner. The cultural education plan details how cultural education and cultural heritage education is implemented as part of teaching in the municipality or region and is based on the municipality's own cultural supply and heritage as well as the spontaneous activities of children. The culture education plan is written and implemented in cooperation between the education and culture sectors. Oulu is aiming to be the European Capital of Culture in 2026. Education and technology are at the core of their

approach and they aim to create long-term partnerships and structures for all European countries to act on children's cultural rights and equality. The Finnish education system is based around a set of transversal competences (see diagram below) which link very closely with the Fusion Skills. For example;

- Thinking and learning to learn = Critical thinking, problem solving and analysis and evaluation
- Cultural competence, interaction and self-expression = Oral communication and presentational skills and creativity
- Taking care of one's self and daily life = Resilience, adaptability and flexibility



The working life competencies are equivalent to the Fusion skills. Arguably, multiliteracies and ICT competence are the means of achieving the other competences and it is to be hoped that the overall result or impact would be "participation, involvement and the building of a sustainable future". These competences are developed through different but complementary curriculum pathways or focuses, for example;

- Wellbeing
- Sustainable Development
- Culture path
- Global Citizen path
- ICT
- Entrepreneurship

- Participation

Oulu prioritises entrepreneurship pathways. These pathways include lead professionals working together from education and culture with both primary and secondary aged pupils; subsidised transport to companies and businesses to ensure workplace-based learning; youth running their own pop-up shop; working life coaches in schools; and, the production of a range of support materials for schools and businesses.

10.10 Reykjavik, Iceland

Reykjavík Education Policy 2018-2030 lays the foundations for progressive work in schools and leisure centres, anchored in the strengths of Icelandic society. At the same time, the policy seeks to meet the challenges of a world characterised by rapid societal and technological changes that transforms children's educational upbringing as well as traditional ideas of learning. Reykjavík Education Policy was shaped in collaboration with thousands of the city's residents: children in preschools, compulsory schools, leisure and youth centres, parents, staff of the Department of Education and Youth, elected representatives, Icelandic and international advisors and the public, and took two years in making.

The purpose of the Reykjavík Education Policy is to establish a broad consensus regarding future objectives of schools and leisure centres in the city and prioritise imperative reform projects. The policy addresses both the formal and the informal learning taking place in schools and leisure.

The Reykjavík Education Policy encourages us to develop school and leisure centre activities into creative learning communities that meet the demands of the 21st century. The policy revolves around children's needs and wellbeing in the present and future, while simultaneously empowering staff and facilitating professionalism in schools and leisure centres.

It is an important task to ensure that children have equal opportunities and access to diverse learning and leisure activities based on their abilities and interests. At the same time, education must increase children's fundamental knowledge of society and nature and bring to bear findings on educational quality from both Icelandic and international studies.

The mission is twofold: Children as active participants; and, professionalism and cooperation. The central goal is that all children develop, thrive, and belong in a democratic society characterised by human rights and respect for the diversity of human life. Reykjavík Education Policy strives to ensure that all children develop a strong self-image, learn to have faith in their abilities, and succeed in their endeavours. Children should read for purpose and pleasure, seek knowledge, and acquire an understanding of society and nature. They learn to show initiative, apply creative and critical thinking, and develop a healthy lifestyle.

Reykjavík Education Policy is grounded in five fundamental Fusion competencies: Social skills, self-empowerment, literacy, creativity, and health.

The policy is being implemented into the work of preschools, compulsory schools and leisure centres with the active participation of leaders, educators and children. In the first year of the implementation phase, the focus has been on increasing funding for development and innovation in education, where all children and educators participate in projects based on the mission and competencies of the policy. The focus is also on providing support for educators by developing assessment tools for the fundamental competencies, providing practical tools for schools and leisure centres, giving professional development, and providing a platform for teachers and staff to meet and develop a learning community.

One of the initiatives evolved around children's participation in the annual children's cultural festival. All children in the fourth grade of our schools (altogether 1600 children) participated in discussion and activities regarding dreams. All the schools had visits from two actors who gave a short theatrical act linking to the educational policy on how to make dreams come true, what are our dreams and what do we need to do to fulfil them. This was a 30 minutes programme followed with group discussion where the children discussed:

1. What are their own dreams?
2. What are their dreams for each other?
3. What are their dreams for the world?

The children's dreams were written down and sent to a music composer and a text writer who composed a song for the festival, based on the children's dreams. The children practiced and prepared for the opening ceremony of the Children's cultural festival where they performed their song.

10.11 Vienna, Austria

"Fusion Skills": The Viennese school system is still in the very beginning – News flashes from the sideline[36]

This year (2019) the University of Applied Arts organized a European conference searching for "S*pecialists of de-specialization*." The intention was to move away from the traditional teacher profile, which is narrowly focused on one or two unconnected subjects. Instead, the aim was that a new generation of "*specialists of de-specialization*" teachers should be trained to anticipate a world not framed by 10 or 12 strictly divided subjects but rather as a form of education where there is "an inexhaustible inter-related 'richdom' of knowledge to be mediated". To be convincing, stimulating and successful, contemporary teachers must meet the whole complexity of problems young people are confronted by.

New teacher training programmes need to be developed for future teachers which are not only about the arts but combine different disciplines in theory and practice. The assumption is that, by taking part in projects which intend to "knot" (interlink) the arts and science approaches, future teachers will be able to experience the multi-dimensionality of teaching and learning processes. In doing so, the learners are not narrowed in their

[36] This text was prepared by Michael Wimmer from Wimmers Kulturservice

frame of specialist knowledge to a particular discipline, but rather learn about meshing knowledge and skills to find appropriate answers to actual challenges.

This kind of approach is still an exception in Viennese schools. Following a long tradition, most of the teachers are still devoted to a narrow system of subject specialization which starts with the very young and becomes even more rigid the older the children become. The result is that the school system is losing contact with the real life in a comprehensively interconnected society.

Some schools are trying to get rid of the traditional curriculum by replacing traditional school organization with a project orientation in which different thematic references are created and new ways of cooperation are implemented. Teachers of different subject areas build teams, share their disciplinary backgrounds, and collaboratively develop their teaching programmes. Partners beyond the school are involved, including cultural institutions, NGOs and/or private companies which allow valuable experiences for the pupils not possible within the school walls. So called "Campus Schools" are in an environment together with out-of-school education providers such as, music schools, libraries, adult training centers and sport clubs.

Ministerial service institutions like KulturKontakt Austria intend to promote schools to cooperate with individual experts such as artists or scientists as well as with institutions. Programmes like *culture connected* or *(p)arts* have been launched to raise awareness and provide necessary resources. Respective projects may last only a few hours or a whole school year and by that, change traditional learning attitudes towards the acquisition of Fusion Skills. These efforts are supported by a new country-wide framework curriculum dividing schooling not only in subjects but in education areas like "culture and society" or "environment, nature and technique". This kind of synopsis allows individual schools to merge different subject approaches alongside the intentions of each education area. At the moment the culture department of the city of Vienna is preparing a programme (with the working title of 'EduArt') implementing a Viennese model of interdisciplinary art mediation with a particular focus on school development which is driven by the acquisition of Fusion Skills, even when the term is not verbally mentioned.

Private schools are building initiatives which dare to be more avant-garde. For example, the school initiative "*Walz*"[37] offers a new way of teaching and learning. For at least two months a year, teaching and learning follows a specific thematic issue which is negotiated from different disciplinary angles, allowing the learners to deal with the complexity of reality. Additionally, it is part of the educational offer to take part in a 'training company' developing 'real' products and services to be placed on the market. The youngsters slip into different job profiles like product developer, designer, product and sales manager, accountant or marketer. In their professional roles they learn to handle 'real things' when they combine learning and practice thereby connecting schools to the real world.

The Viennese school system is increasingly framed around school autonomy. As such, there is no systematic observation about how far the implementation of the idea of mediating Fusion Skills has gone. Some schools are rather advanced in this direction whereas others remain in the 19th century traditions. The growing levels

[37] https://www.walz.at

of autonomy of schools in Vienna, means making an overall review of the extent to which Fusion Skills are being implemented is challenging.

11. Actions emerging from the First Fusion Cities meeting

The City Corporation has committed to continuing to drive forward the importance of social mobility, lifelong learning, digital competencies, work-related learning and the role of arts and culture through its work around Fusion Skills. Meetings will be held each year for the next three years and between the meetings, practical and strategic work is being completed to drive the wider movement around Fusion Skills. A 'movement' and reform framework are being used to enable change.

We assume that 'the why' is clear. That we can't just do what we have been doing and so the Fusion Cities of the Future meeting agreed to focus on WHAT and HOW. Each attendee undertook to promote a shared, central continuum and to pursue local, impactful experiences based on an acknowledgement of the importance of place.

11.1 Where will we work?

As can be seen in Section 10, each of the cities involved in the Fusion Cities of the Future event have demonstrated a robust and ongoing commitment to taking a systemic, place-based approach to continue to focus activities around the development of Fusion Skills. By adopting both a global vision and very local, place-based actions, it is the intention that cities can learn from and with other places where there are similar ambitions. This approach might involve joint policy construction, sharing of working practices, and, practice development. As each year for the next three years it is intended that we double the numbers of places involved, work is already underway to identify possible places to invite to the next meeting. This is occurring both directly and through our partner cities who are already researching interesting places to invite and to highlight other cities of innovation where we may already have relationships. The list is growing of interesting places and some areas already identified include Delhi, Brunei and Palestine, while places in Jordan, Ghana, and Ethiopia have also been highlighted. While the first year of the meeting focused on UK and European cities, this will continue to be important, but the reach will be widened as the Fusion Cities of the Future meeting also provides an opportunity to develop new relationships and connections.

11.2 What will we do?

As sponsors of the first three annual Fusion Cities of the Future meetings, the City Corporation is itself continuing to complete actions and share the findings broadly to further the movement towards wider adoption of Fusion Skills. In particular, the following activities are occurring over the next 12 months as a direct impact of the June 2019 Fusion Cities of the Future meeting, and the City Corporation will:

1. Convene an annual meeting of other London, national and international businesses, education providers, cultural venues and cities of innovation, with a minimum of 6 + 6 + 6 cities invited to participate

2. Connect key people via email to form an influential network of 'places' where there is a clear link between education, business and the cultural and creative sector to develop Fusion Skills within an ethical context of social mobility and sustainability

3. Empower attendees to experiment, co-create, share and immerse themselves in Fusion Skills to build new knowledge

4. Conduct research mapping all the 'assessment tools' and 'fusion/future' style learning resources. This would also enable us to establish a taxonomy of existing frameworks and 'tests' of Fusion Skills to ensure that we have a comprehensive 'comparator' framework

5. Focus on developing a national and international standard for Fusion Skills including a Fusion assessment tool (influencing schools and lifelong learning) aimed at designing (or gathering) assessment models that can provide both a skills development pathway and a certification pathway aligned to a global standard

6. Convene partners to co-design tools and frameworks (both for assessment and for lifelong learning) relating to Fusion Skills that are practical and useful for policymakers and practitioners

7. Initiate our strategic ambition to promote a global vision around the importance of Fusion Skills while encouraging 'at-scale' partnerships at the local level

8. Continue to expand the network of innovative places and organisations involved in promoting Fusion Skills

9. Communicate to create a Fusion-focussed global 'community of practice' aimed at sharing and system reform, which will be expanded beyond the initial participants, and the initial focus.

Further actions agreed by participants and wider partners included:

- To establish dialogues at the local level with people who do not agree to engage them in conversation, explore any 'blockers' in the system and to help them understand and appreciate the importance of Fusion Skills

- To support the development, piloting and dissemination of the Fusion assessment tool to transform the way we assess what it means to be skilled, knowledgeable and competent, including to engage in beta testing of possible models of assessment, tracking and reporting of Fusion Skills

- To share learning from any 'failures' to ensure we are reflective, evaluative and impactful

- Refine principles for both system reform and adaptive programming

- Encourage a gathering of potential researchers working in this field to develop a research network.

Other actions emerging around the Fusion Skills also includes:

- Microsoft have offered to run workshops around Fusion Skills to determine opportunities and generate ideas for partnership working
- UNESCO is interested in supporting a virtual global repository which could 'hold' Fusion Skills partnerships, research, related resources and developments

The participants at the Fusions Cities of the Future meeting also made direct and personal 'pledges' of action. These were captured on postcards which were then sent back to the participants to remind them of their undertakings in relation to personal practical actions. Some of these undertakings included to:

- Attend the future events
- Generate thoughts and ideas
- Share practice which is working
- Network and exchange with other people
- Enlist more partners
- Run 'a Fusion' event or session of their own
- Assist in providing contacts of additional people who should be involved and invited to the next event
- Enter the Fusion Prize, and encourage other people to enter it
- Contact Life Labs to participate
- Develop practical ways of spreading teaching tech, from training the teachers to each teacher teaches one pupil
- Continue research into the interconnectedness of creativity across the industry. Also, to focus on sustainable retail solutions. Notably, recycling in fast fashion
- Complete design of HELP Careers System - based upon fusion attributes covering, free for all students, whatever their levels and aspirations

The following quotes provide a flavour of the enthusiasm the Fusion Cities of the Future event generated and its likely impact in terms of future action and amplification.

> *"When I leave here today, I will return to my school and share all the great things I have learned today. I will then give an assembly on this to make others aware and try my very hardest to*

install fusion skills into my school and hopefully create positive outcomes which other schools will wish to follow! Thanks again for the organisation of such a fantastic event and opportunity."

"Thank you for one of the most inspiring and thought-provoking days, I have had the absolute pleasure of being a part of it. We need to convert all the old and emerging ideas into positive action and embed the undisputable principles into learning at the earliest possible age. I pledge to commit to this within all environment I am in - both work and play."

"Could we replicate a discussion about FUSION within Dundee? Could we extend this dialogue into our key UNESCO partner cities - Geelong/Helsinki? Also, how do we bring together our key industry, technology, FE and HE partners to explore: Transversal skills and Technical skills."

"SPREAD THE WORD 'FUSION'/CAPRI INTERNALLY."

"Explore DQ tool as the benchmark. Use Skills Builder as a framework for employment support? Look at CAPRI model? Connect with Dundee and other cities? Look at 'Playablecity.com'."

"Find out more about cities of learning. Get involved with fusion prize culture mile. Add fusion skills to milestones more explicit in centre's activities. Build culture, skills, tech, education more explicitly into programme. Be more proactive in local creative digital industries. Write creative and cultural bio."

"Incorporate fusion skills into UBC development programmes and initiatives."

"Follow up on with the people I met today!! Push forward the development of a central information resource (web portal) signposting and connecting activity and initiatives and organisations and individuals across: Talent and skills/Apprenticeships/Ed Tech (currently under development) Promote through Tech London Advocates. Education group. (www.techlondonadvocates.org)"

"Read, meet, collaborate, Finland, Sweden + Netherlands."

"Collaborate with the Aircon Trust. Foreground high quality artist led private in all our work. Read more widely. Learn from the Scandinavians."

"Partner with Cultural Mile to embed fusion skills/processes in work placement experiences for widening participation undergraduates from NW England."

"Finish the Livery Beta and get it used in many schools."

"Distribute our 2019 Global Project Management Benchmark report to Fusion for distribution."

"Report event results and process to four European projects to get feedback and new participants."

"I will gather our Scottish participants to meet and review consider how fusion skills exists within existing Scottish curriculum for excellence. Get some more people from education involved."

"Talk to people about fusion skills: friends, student council and school committee. Adopt the fusions into my life. Subscribe to organisations and websites working towards adding fusion skills to the education system. Create plan for fusion skills."

"I will change my conferences next year and my meetings with the managing team. I will bring culture and education together with City development in Nacka."

"Get in touch with representatives from the cities of Oulu and Bamberg and the OECD to try and develop training in fusion skills for teachers in the UK and elsewhere. #EmpowerTeachersToEmpowerKids."

"Create a proposal for a disposition-focused version of '100 resilient cities' and SELL IT!"

"Take time to understand the Ed Tech models of the visiting cities."

"Run an event at New Cross Learning and be ready to expand by 19/06/2020"

"In Summer 2019, I will connect with at least three organisations I discovered today and explore collaboration possibilities."

"Using my network of meeting Cities of the Future; Finding another European city for the second meeting in 2020; Implementing my knowledge and experience gained during the meeting; KEEP IN CONTACT!"

"Think about fusion skills within the Under 18's provision at Guildhall School."

"I will explore the potential of getting fusion skills models or practice more global. Meet and investigate how intercultural fluency can be at the heart of fusion skills frameworks."

"Empower more 14-25 years old UK wide, to build tech-enabled B12 solutions to tackle the global goals. #The(Fusion)Factor. Factor fusion into your FUTURE!"

"Get Liverpool involved with the aim to be here June 2020. Good Luck!"

"Finalise impact framework to demonstrate the social impact of urban partners (the Business Partnership for Kings Cross)."

"Follow up on the many connections made today. Share Camden STEM fusion approach."

"Establish fusion skills badges. Get DQ Institute membership and engagement."

"Consult -> Discuss -> Agree on a related use of the Liverpool Finsbury Square building; student interests and/or 'culture mile' support?"

"Mention fusion skills in the North East's Local Industrial Strategy!"

"Support the City of London through the DQ open data and assessment."

"Creative work and personal trainer vs life coach and Moet!"

Hopefully, these quotes will be a timely reminder for the conference participants of the commitments and impact from the Fusion Cities of the Future meeting. For non-participants reading this report, it might inspire action or at the very least whet your appetite to attend the meeting in June 2020.

11.3 Why should we do this now?

Of course, it is very easy, even after the most inspiring of events, to revert to the 'status quo' and the same state as before the event. However, it was really hoped that the meeting would generate a serious call to prompt action, NOW. The global need for deeper thinking and practice on education and skills system reform is urgent. By committing to follow-up meetings, actions, impact and reporting we are pushing to create some momentum and to amplify some excellent work on reform already underway in many organisations and places. Continued energy and commitment are needed as this work relies on innovation, creativity and lifelong learning and so it will always be 'work in progress.' Moreover, change will only occur through real-world engagement, testing and piloting ideas, accelerating and amplifying effective practices, sharing, reflecting and communicating. This is all summarised through one great quote from a participant at the Fusion Cities of the Future event, who said, "This is very exciting indeed!

11.4 Who might support this?

While the City of London has committed to supporting this work from 2019 to 2021, for the fusion skills to make the level of global impact needed, the support of many stakeholders will be needed. This support may take many forms. For example, organisations (including schools) and regions might provide opportunities to test some aspects of system reform (at programme or policy level). Some organisations may want to focus on certain aspects of the fusion skills or on matters arising from the 'disruptions' identified in the first meeting

(see chapter 5). Alternatively, they may wish to focus on pre-determined reform elements, such as teacher quality, learning in the workplace, the role of cultural institutions in fusion skills development, technical solutions and so on.

The Fusion Cities of the Future event involved a range of stakeholders who may be able to fund, promote and/or support future work. These included:

- Businesses, with a vested interest in how fusion skills can ensure that that there current and future skills needs are being met to create highly skilled and motivated workers
- Schools and other education providers who want to be designing curriculum in the most efficient and 'future' ready way for their students.
- Charities, trusts and foundations (as well as corporate donors) who want to ensure that fusion skills are accessible to all people and to boost social mobility outcomes for disadvantaged groups
- Local, regional, and national governments and international NGO's which might be more willing to invest in a whole-system approach to essential reforms.
- Children and young people (and their parents and carers) who are calling for urgent responses to some of the disruptions identified and who might add their passion, interest and lobbying prowess to boost the more rapid adoption of fusion skills

In addition to these general groups of 'supporters', some groups were suggested by participants as being key potential partners/participants at the next event. While the following provides some specific suggestions, we would welcome ideas of other individuals, organisations, and/or places to connect with.

- Five Curious Countries might provide us with an opportunity to test new approaches
- There may also be options for participating countries to contribute their own funding.
- The Rockefeller Foundation - 100 Resilient Cities
- Atlantic Rim Collaboratory (Steve Munby is a founder and still involved)
- Deep Learning Partnerships (established by Michael Fullan)

A further way that the City of London is supporting the development of Fusion Skills is through the Fusion Prize.

11.5 Fusion Prize

The Culture Mile Fusion Prize (2019)[38] uses the entrepreneurial challenge prize model to spur innovation and cross-sector collaboration in the City of London for the benefit of young Londoners. Challenge prizes have a long history of generating solutions to shared problems and can result in economic activity up to 20 times the amount of the prize value.

The Fusion Prize is an open competition to connect with talented young people and to recruit new talent. This innovation challenge promotes user involvement and stimulates activation around Fusion Skills. The Fusion Prize will invest in innovative solutions for equipping young Londoners with the skills they need to have a successful career in the 21st century, by inviting passionate individuals and teams drawn from businesses, schools, universities and charities to pilot inspiring solutions for upskilling young people through cultural activities.

The prize responds to the challenge many young Londoners face in developing Fusion Skills – a mix of skills which go beyond STEM to encompass digital, creative, interpersonal and problem-solving skills. Many young Londoners entering the workforce, particularly those from disadvantaged backgrounds, are missing out on opportunities to develop Fusion Skills through traditional education and employment pathways, a gap that cultural participation can help address.

Please refer to the website for more details on how to enter the Fusion Prize and events to support the development of fusions skills.

12. Conclusion

The meeting of kindred spirits from very different sectors and backgrounds offered the opportunity to be inspired. The Fusion Cities of the Future meeting enabled the formation of a significant group of like-minded people who have contributed ideas, experience and examples to further the wider adoption of Fusion Skills. As a group, and in their spheres of influence, they have undertaken to continue to test, research, and pilot fusion skills. They will share future learning and be transparent about their ways of working. The people who participated in the meeting were influential and are more than capable of really making a difference and bringing about change. The participants were focused and generous and they identified the right opportunities, to align with the right partners, to drive the right innovations. Individually and collectively they are innovators, thinkers, activists and influencers who are actively redefining, re-evaluating and challenging the current practices to generate real change in the future.

Final Poem reflecting the Meeting

[38] https://www.culturemile.london/fusionprize?dm_i=4S3S,8D36,254U96,VB0J,1

Energy, Effort, Time![39]

Energy, effort, time,

making talents combine.

We all embrace variety

but we are all under pressure from society.

Rapid learning,

the world keeps turning,

we are all ideas Synthesists!

We are all of this, amidst

ever changing adaptability,

but all of us have an element of fragility.

So please, handle each of us with care,

because all of us are on the same journey,

just trying to get there.

[39] By Paul Lyalls, http://www.paul-lyalls.uk

Appendix One: Meeting methodology

Following the London meeting, many people are keen to host their own local 'Fusion' event. For that reason, this appendix contains some practical resources to help you run your own local level meeting. Of course, these are just some ideas. There is no right or wrong way, and you are encouraged to try original and innovative approaches to meeting and to share these approaches with colleagues.

The ideas in this part of the report are included to inspire other areas to consider hosting their own meeting, using or adapting a methodology appropriate to their unique locality and context.

If you would like to become further involved in this movement, please also read the *Manifesto* and *Ideas for Action* documents.

Practical approaches

- Choose your guests carefully, including a balance of people from different backgrounds and sectors. The people should have a common interest in innovation, reform and Fusion Skills but try to focus on people who would be unlikely to have met before
- During the event, provide different ways of working including working alone, in pairs, in small groups and altogether
- Encourage movement and active participation so people can network and connect
- Share a meal together
- Encourage new ideas and sharing through talking, listening, co-creation, solving problems, proposing solutions, modelling Fusion Skills in practice, and influencing others
- Plan activities which promote crowd-sourced, Idea-attainment (ideas presented in interesting and entertaining ways)
- Pose questions to start thinking but also promote ways for the participants to pose questions
- The aim is to inspire, engage, realise and so towards the end of the day, ensure that there has been an opportunity to convert planning outcomes into a set of prioritized 'wants' or at least design briefs
- Brainstorm the potential resources to make actions happen, as there is nothing worse than a good idea with no resource to make it happen

Try these ideas

- ***Torchlight moments***: Rather than traditional keynote speeches, instead throughout the day, 'shine the light on people' to get their thoughts and reflections and to hear a bit more about what they are achieving in this space. Torchlight moments should last around 3-5 minutes. The torchlight moment should link the ideas being generated to people's own work, provide a space to challenge ideas you disagree with, and voice some challenges/opportunities for whole the group. People can be pre-chosen to do torchlight moments throughout the day, but also allow spaces for people on-the-day to volunteer to be a torchlight moment.

- ***Note taking****:* Note taking should be participatory with everyone in the event contributing to this process. Note taking, should not be an 'add-on' but rather be embedded in the activities themselves. For example:

    - Cover tables with paper so people can write their ideas

    - Have small or large whiteboards available for formulating ideas

    - Have lots of notice boards where people can pin things

    - Install a 'virtual cloakroom' where people can 'hang' ideas to be collected at the end of the event

    - Provide bold markers so people can circle, highlight, reflect on other people's ideas

    - Take photos and encourage others to do the same

    - Capture 'fingerprints' (the gentle mark left by people) from the discussions rather than the traditional 'plenary'

    - Send the notes and artefacts from the meeting to participants and encourage them to edit, reflect upon, highlight, amplify, etc the elements that have most meaning to them

    - Use the arts, to 'note-take' for example have a poet, writer, composer, cartoonist, animator, filmmaker, illustrator etc on hand to capture thoughts during the day and at the end.

The poet Paul Lyalls[40] wrote poetry to capture elements of the day.

Tea Break Poem

It's tea,

It's free,

It's for you and me

Yippee!

- ***Speed-geeking***: Speed networking session where people meet each other in brief 3-minute rounds and imagine that the person they are meeting is a geek who loves the interest you have and so immediately you can go into talking about the thing you really care about or are interested in. The moderator keeps track of time and announcing participants when to switch partners.

- ***Human Spectrogram****:* This is literally voting with your feet. Survey questions are asked with the usual '5-point' scale for answers placed around the room. People respond to the questions by moving to the answers placed strategically around the room and allowing people to start to connect with views like their own, but also to be challenged by different views.

[40] http://www.paul-lyalls.uk

- ***Snowball fight of ideas:*** Provide stacks of paper and pens and ask people to write what they see as a disruptor on the paper. One disruptor per page in big bold, easy to read, writing. Everyone stands up and scrunches their pages into tight balls. Everyone has a 'snowball fight' with the paper balls. At the end, people pick up some 'snowballs' off the ground and find a partner to discuss these with. Together they consider solutions to the disruptions identified.

- ***World Café***

  Have groups of around eight people seated around a table. Each round is prefaced with a question. At the end of each 15-minute round, members of the group move to the next table. Each table has a "table host" who remains at the table, welcomes the next group, and briefly fills them in on what happened in the previous round and continues the discussion from where it was up to in the last round. Once all rounds have been completed, key points from each table are presented to the whole group.

Appendix Two: Questions we asked

The following questions framed the first of the Fusion Cities of the Future meeting:

- What is already happening that could influence our thinking and actions?
- What ideas already exist that could be more influential if combined?
- What could we prototype?
- Who are the interesting 'start-ups' (not just entrepreneurs and businesses, but interesting groups, individuals, trends, etc.) that work on promising ideas, opportunities, technologies or creative products who might help us with solutions or be influential to partner with?
- What further steps could different levels of government, including the important role of local government to promote the creative industries and the value of the creative sector? Promote local creative careers
- What is the role of community-led organisations and charities to promote Fusion Skills and greater social integration and skills provision?
- What funding and resource is available across the board to make these changes? Could it be better deployed if it was more aligned?

- Where do you see areas for potential growth?
- What are the key skills gaps that the tech industry faces itself?

Appendix Three: Further reading list

You may find the following interesting:

If you have a report or link you would like to share with the rest of the group, please send links and these can be added to the report and circulated.

OECD report: Three mega-trends which have the potential of significantly altering the nature of work

https://www.oecd.org/els/emp/wcms_556984.pdf

OECD report: The future of education and skills Education 2030

https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf

OECD report: Envisioning the future of education and jobs

http://www.oecd.org/education/Envisioning-the-future-of-education-and-jobs.pdf

DQ Institute: Empower Every Child with Digital Intelligence by 2020

https://www.dqinstitute.org/2018dq_impact_report/

Nesta report: The Fusion Effect

https://www.nesta.org.uk/report/the-fusion-effect-the-economic-returns-to-combining-arts-and-science-skills/

University report on future skills challenges

https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2018/solving-future-skills-challenges.pdf

Future of Skills and Lifelong learning (govt report)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727776/Foresight-future-of-skills-lifelong-learning_V8.pdf

Joint Dialogue – how are schools developing real employability skills?

https://www.educationandemployers.org/wp-content/uploads/2018/11/JOINT-DIALOGUE-FINAL-REPORT-3.pdf

Employer Skills Survey 2017

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746493/ESS_2017_UK_Report_Controlled_v06.00.pdf

2016 The Right Combination

http://www.cbi.org.uk/cbi-prod/assets/File/pdf/cbi-education-and-skills-survey2016.pdf

2016 Digital Skills for the UK Economy

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492889/DCMSDigitalSkillsReportJan2016.pdf

Appendix Four: List of attendees

Business	Joanna Abeyie, Joanna Abeyie Consultancy
Business	Esenam Agubretu, London Chamber of Commerce and Industry
Business	David Barker, Placer
Business	Lola Bejide, Soluman Consultancy
Business	Andrew Caleya Chetty, Umbrellium
Business	Lua Cooper, Google - Upskill Digital
Business	Christian de Vartavan, PUBLIQ
Business	Aga Gajownik, Consultant
Business	Giancarlo Gini, Confederation of British Industry
Business	Andrew Gourlay, Ted Baker
Business	Joe Gray, Consultant
Business	Donatas Gricius, Google - Upskill Digital
Business	Georgia Hanias, Ecology Media
Business	Mark Hilton, London First

Business	Stephen Hogan, Exogeny
Business	Mark Hudson, AXELOS
Business	Joyce Hytner, Act IV
Business	Antonella Iannuccelli, UBS
Business	Mark Jenkinson, Siemens
Business	Kerensa Jennings, iDEA
Business	Rebecca King Lassman, Act IV
Business	Colin Knight, Synexus Solutions
Business	Olivia Knight, Patchwork
Business	Agnieszka Kurzawa, Consultant
Business	Kate Lander, Ivy House
Business	Peter McDonough, Ted Baker
Business	Peter Mulligan, SACU-Student
Business	Vanessa Munteanu, Lobster Media
Business	Hilary O'Shaughnessy, Watershed
Business	Michael Osbaldeston, City & Guilds
Business	Jo Pursaill, ManpowerGroup
Business	Tim Riches, Digitalme
Business	Bronte Rosebery, Google - Upskill Digital
Business	Nikki Shepperd, Koko Consulting
Business	Phil Stokes, PWC
Business	Sheldon Stoutt, Synexus Solutions
Business	Jo Tasker, Tasker Consulting
Business	Subash Tavares, Transport for London
Business	Clive Thompson, Thompson Clive Ltd

Business	Allan Thomson, AXELOS
Business	Maya Tudor, Google
Business	Oliver Vicars-Harris, Connecting Culture
Business	Steve Wake, Consultant
Business	Jill Whittaker, HIT Training
City of London	Sufina Ahmad
City of London	Nick Bodger
City of London	Beth Crosland, Culture Mile Learning
City of London	Elisabeth Goodwin, Worshipful Company of Educators
City of London	Tim Jones, Culture Mile
City of London	Faiza Mahmood, Culture Mile Learning
City of London	Rosemara Mather-Lupton, Culture Mile Learning
City of London	Daniel McGrady
City of London	Chris Oldham
City of London	Tim Wainwright
City of London	Jessica Walsh
City of London	Chris Web, Barbican
Education	Steven Berryman, City of London School for Girls
Education	Sian Bird, Guildhall School of Music and Drama
Education	Jeff Blackford, University of Liverpool in London
Education	Jim Bown, Abertay University
Education	Helen Bruckdorfer, Torriano School
Education	Phil Chamberlain, City Lit
Education	Alison Clark-Wilson, UCL
Education	Claire Dow, Dundee University

Education	Tanya Dunne, University of Liverpool in London
Education	Cleo Fatoorehchi, UCL
Education	Frank Green, Consultant
Education	David Holloway OBE, The Ideas College
Education	Sarah Horrocks, London Connected Learning Centre
Education	Diana Jeater, University of Liverpool in London
Education	Rosemary Luckin, UCL
Education	Mark Malcomson CBE, City Lit
Education	Andrew McBroom, City of London School for Girls
Education	Lisa-Maria Muller, The Chartered College of Teaching
Education	Carlo Rizzo, Consultant
Education	Jonathan Vaughan, Guildhall School of Music and Drama
Education	Annabel Wellburn, City of London Freemen's School
European Cities	Katrin Atladottir, City of Reykjavik
European Cities	Klara Palmberg Broryd, Broryd industrier
European Cities	Lena Dahlstedt, Nacka Municipality
European Cities	Claudio Dondi, Consultant
European Cities	Hanna Elving, Nacka Municipality
European Cities	Einar Fransson, Nacka Municipality
European Cities	Valerie Frissen, SIDN fund
European Cities	Pernilla Glaser, RISE Interactive
European Cities	Judith Groenewoud, Stichting Cultuur Eindhoven
European Cities	Skuli Helgason, Reykjavík
European Cities	Adrianna Hlukhovych, Bamberg
European Cities	Kai Huotari, The Cable Factory

European Cities	Frida Jonsdottir, Reykjavík
European Cities	PauliinaKanervo, City of Oulu
European Cities	Martha Kummer, Bamberg
European Cities	Gudrun Lange, Bamberg
European Cities	Anne Laurila, BusinessOulu
European Cities	Anders Mebius, Nacka Municipality
European Cities	Tanja Mlaker, Stichting Cultuur Eindhoven
European Cities	Tommi Nevala, City of Oulu
European Cities	Jaakko Nousiainen, The Finnish Institute in London
European Cities	Frida Plym Forshell
European Cities	Katri Tenetz, City of Oulu
European Cities	Briony Vanden Bussche, Heart Brain Academy
European Cities	Sabine Vogt, Otto-Friedrich-University Bamberg
European Cities	Johannes Weber, Otto-Friedrich-University Bamberg
European Cities	MichaelWimmer, EDUCULT, Austria
NGOs	German Bencci, Code Your Future
NGOs	Nick Chambers, Education and Employers
NGOs	Kelly Chaplin, Royal Society
NGOs	Gina Cicerone, Fair Education Alliance
NGOs	Debbi CLARK, Sir Hubert Von Herkomer Arts Foundation
NGOs	Rosie Clayton, RSA
NGOs	Christopher Clouder, Consultant
NGOs	Geraldine Collinge, Royal Shakespeare Company
NGOs	Shelly Donaghy, The Prince's Trust
NGOs	Jason Elsom, Founders3Schools

NGOs Clive Gillman, Creative Scotland

NGOs Joe Hallgarten, Education Development Trust

NGOs Mark Herbert, British Council

NGOS Kate Jones, Childnet

NGOs Alec McCrindle, Code Your Future

NGOs Steve Moffitt, A New Direction

NGOs Rosa Morgan-Baker, The Brokerage

NGOs Clinton Riley, CVQO

NGOs Rachael Saunders, Business in the Community

NGOs Rosalind Stuart, Founders4Schools

NGOs Emma Sutherland, Nesta

NGOs Liam Tootill, Founders Forum

NGOs Lydia Wakefield, Creative Industries Federation

NGOs David Watt, Art & Business Scotland

NGOs Emma Weston, Digital Unite

NGOs Maxine Willetts, Epic CIC

Tech Partners Emily Larson, Behavioural Insights Team

Tech Partners Tom Ravenscroft, Skills Builder

Tech Partners Charlie Rigby, Challenger Trust

Tech Partners Nick Wright, UBS

UK Cities Cinar Altun, Greater London Authority

UK Cities Robin Beveridge, Newcastle City Council

UK Cities Steven Kyffin, Northumbria University

UK Cities Will Mapplebeck, Core Cities

UK Cities Kathy McArdle, British Council

UK Cities	Leigh Mills, Newcastle City Council
UK Cities	Ashton Mullins, Foundation for the Future London
UK Cities	Stewart Murdoch, Dundee City Council
UK Cities	Dick Penny, West of England LEP
UK Cities	Michelle Rainbow, North East LEP
UK Cities	Rebecca Roper, Greater London Authority
UK Cities	Dimitra Simeonidou, University of Bristol
UK Cities	Danielle Tobin, Camden Council
Young People	Ilhan Ali, Student
Young People	Miranda Aresu, Student
Young People	Angus Bamford, Goldsmiths College
Young People	Lewis Blake, City of London Freemen's School
Young People	Yoshi Bravo, Student
Young People	Emily Burt, City of London School for Girls
Young People	Theodora Galva, Goldsmiths College
Young People	Chayan Jimenez, Student
Young People	Natalia King, Student
Young People	Katarina Korbelova, Student
Young People	Beulah Kuku, Student
Young People	Leah Maffia, Student
Young People	Sam Morgan, Student
Young People	Syed Muqtadir, Student