

Education 2020-70
Challenge Title: Diverse Populations

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I. Introduction

The following addresses the brief to write an outline of at least 2500 words for a research outline considering the challenge of diverse populations to providing education 2020-2070 in the light of changing technology. Our specific expertise is in social and demographic change, and in life-long learning, and we have also drawn on the presence of experts in both bio-technology and digital and information technology here at Oxford.

II Context and Key Questions

This section introduces the broad context to the challenge of Diverse Populations, highlights relevant questions and attempts to identify the ways in which the challenge would engage with the following cross-cutting questions: Appendix C: 1-2,4.

II.I Diverse Populations : 2020 – 2070

The population of the world aged 60 years and over increased from 205 million and 8 per cent in 1950 to approximately 688 million and 11 per cent in 2006. By 2050, the number will have increased to around 2 billion and 22 per cent. By 2030, half the population of Western Europe will be over 50, one quarter of the population of the developed world will be over 65, and one quarter of the population of Asia will be over 60. This is historically unprecedented. Indeed, it makes the 20th century the last century of youth, the 21st century heralds a new demography - that of maturity.

These dynamics are as much the result of falling fertility as of increasing longevity as across the world women are choosing not to have large numbers of children, to delay or even reject first childbirth. Coupled with increasing longevity, this sees ageing flood out across the globe. Indeed the scale of ageing over the next 50 years is immense. According to the United Nations forecasts, the population aged 60 years and over is expected to increase from 20 to more than 30 per cent by the year 2050 in the more developed regions, from 8 to 20 per cent in the less developed regions, and from just 5 to 10 per cent in the least developed regions. And these are projections from incremental longevity. What will be the demographic consequences if radical longevity becomes a possibility for entire generations? The prospect of a relatively long and healthy life is real for most of us and there lies the challenge and the opportunity for every individual, country and government in a world of increasing longevity.

For the UK, as for most other countries in Western and Northern Europe, the demographic situation is defined principally by the combination of three dominant trends: a fertility rate that has been below replacement level for several decades now and is thought unlikely to rise above it; unprecedented and continuing declines in late-life mortality; and relatively high levels of inward migration. This has already resulted in a UK society which is characterised by a decline in the proportion of younger people (through falling fertility), an increase in the proportion and number of older people (through both falling fertility and mortality), and a more ethnically diverse composition (through increased migration).

The challenges posed by these trends can be grouped into four main categories: those that arise from the changing age structure of the population – specifically the increase in the proportion of older people and the decrease in the proportion of younger people (i.e. changing dependency ratios); those that arise from the ageing of the older population (i.e. more people surviving in 'late old age'); those that arise from inward migration and the growth of migrant communities within the host society; those associated with persistent below-replacement fertility (i.e. population decline as opposed to population growth). It is evident that these challenges are not independent of each other, and furthermore that

trends in one driver of demographic change may offset or compound the impact of trends in another. For example, changes in the age structure of the population are driven partly by the ageing of the older population and partly by below-replacement fertility. Large-scale inward migration is likely to have a temporary effect on the age structure of the population and will delay the trend towards natural population decline inherent in below-replacement fertility. Policy makers need to have an understanding of the challenges and opportunities of population change that fully integrates all three of the main drivers of change. Furthermore, the challenges that demographic change poses for the UK cannot be understood solely in terms of the demography of the UK. In an increasingly globalised world, we cannot suppose that the UK will be immune from the impact of global patterns of demographic change. Nor can the demography of the UK be understood apart from these same patterns of change.

The UK's past experience of mortality, migration and fertility is written into its age structure. Like the rest of the EU, it has moved from positive demographic momentum (growth) into negative demographic momentum (shrink) (though in practice mediated by inward migration). This aspect of the *second demographic transition* is being mirrored in other parts of the world, particularly Asia as fertility falls from the replacement levels of classic demographic transition theory. A *third demographic transition* driven by international migration is also beginning to change regional and international population structures. It is currently uncertain how low fertility will fall in Europe and some of the more advanced Asian countries. A combination of further declining family size ideals, continued postponement of childbearing and bio-medical factors affecting both men and women may well lead to fertility levels so far below replacement level as to have dramatic consequences for the social and economic structures of society. The recently proposed "Low Fertility Trap Hypothesis" assumes a bifurcation among industrialized countries under which the lowest fertility countries would see further fertility declines while another set of countries would experience stable fertility only slightly below replacement level. Alongside these lie new perspectives on mortality forecasting, which acknowledge that there is much greater scope for reductions in mortality at higher ages than previously acknowledged.

UK population change also needs to be seen in the wider context of globalisation, It is essential therefore to understand the ways in which global patterns of demographic change are likely to present both policy challenges and opportunities for the UK. A key question, for example, is whether we should expect demographic convergence to accompany socio-economic convergence and the role that migration has to play in this process. Yet, globalisation also needs to acknowledge the powerful dynamic of global ageing. As restrictions on the movement of human and financial capital around the world are eased, demographic change becomes a potent force for change in the global economy. Exactly how these changes will play out remains poorly understood, though some of the outlines are clear. Large shifts in national age distributions are likely to affect national saving patterns, capital requirements and international capital flows, particularly between the more and less developed worlds. The demand new workers in more developed countries is already increasing, and is set to increase further at the same time as the supply of younger workers will tighten. Such changing migration flows will have considerable implications welfare systems, and for the provision of education, health and social care, housing, transport, and basic infrastructure in both the host and source countries.

The future promises many similar scenarios across many different sectors of the national economy, with skilled labour being pulled out of the country as well as pulled in. The whole question of UK identity becomes important here, for example, the tension between multiple identities with allegiance to both source and host country, and between ethnic and national sentiments. Broader questions include: to what extent can and should immigration mitigate certain negative effects of demographic ageing?; what policies should be developed for better integrating these migrants, in particular young people?; how could the legislative and financial frameworks and incentives combat discrimination and promote integration of immigrants? What is the role of education here?

As the UK demographically ages, one of the main policy challenges is to enable individuals to maintain their health and productive capacity for as long as possible. We need to consider how the organisation of work can be best adapted to a new distribution between the generations, with fewer young people and great numbers of older workers, to take into account the specific needs of different age groups; how parents' integration in working life can be facilitated and how they can achieve a balance between flexibility and security to bring up their children, whilst training and updating their skills to meet the demands of the labour market. We need to decide what is an appropriate balance between investing in early education and in adult and life long training schemes. There is also concern over the intergenerational contract and changing patterns of intergenerational solidarity as societies age.

Uncertainties

Exactly how these trends will develop over the course of this century is uncertain, though the broad outlines in the shift in population age structure appear clear. In the developed world, for example, there are relatively large birth cohorts now in mid-life, that are longer-lived and have lower fertility than their parents. These three factors mean that their entry into old age will generate what is sometimes described as an 'age wave' or 'demographic shock' that will subsequently subside as smaller cohorts take their place. Old age dependency ratios will increase sharply as the consequences of rapid and large declines in fertility work themselves through the population. However, the continued increases in longevity, including potential radical increases due to new generation of technological advances, accompanied by persistent falls in fertility, mean that the population structure of both the developed and developing regions may well dramatically alter over the course of this century.

There is, however, policy-relevant uncertainty. Current assumptions on longevity, for example, may turn out to be too conservative due, for example, to the speed of technological advance in biomedicine, or indeed, too optimistic due, for example, to the increasing incidence of obesity. The extreme scenarios we now have to consider include the possibility that biomedicine will enable young children today to remain active and healthy as centenarians as well as the possibility that their life expectancy will be less than that of their parents

There is also uncertainty about the future of human fertility – especially in those countries which already have fertility rates below replacement level – as to whether it will continue to fall or to 'recover' and then stabilise at the kind of level that the UN assumes in its medium-variant projections. Some demographers (Lutz 2006), for example, have suggested that countries with very low fertility could get stuck in a 'low fertility whereby social and economic adjustments by institutions and individuals would make it difficult for fertility to rise to replacement levels again'.

Most countries in the world have developed public institutions for transferring resources and support between working generations to dependent younger and older generations. Population ageing is bringing about such large changes in the relative size of these generational groupings that policy-makers have to re-consider the operation of the institutions that channel public resources and support between these generations. In addition, declining fertility affects the collective capacity of society to provide these goods and assist with the problems that face the ageing individual.

While policy makers recognise that they have to help their societies adjust to a low-mortality and low-fertility future, they are unclear as to how large these adjustments will have to be. As individuals we may be required to reconsider the way in which we allocate consumption and resources between different stages of the life course. As societies, we have to decide how to allocate the burden of adjusting to demographic change across (i) different parts of the life course and (ii) different generations. The adjustments required in order to finance the additional consumption of longer-lived population under conditions of declining fertility clearly pose major allocation and distributional challenges. In particular,

we must consider what changes in our collective arrangements for transferring resources and support between generations are fair under conditions of population ageing.

Mature societies

There is then no doubt that population ageing will have far reaching and as yet unforeseen consequences on society.

- More **generations** will survive next to each other than ever before; people will increasingly pass income, care and support down as well as up through the generations Intergenerational solidarity will take a different nature as intergenerational transfers and justice move to the fore of policy concern and will influence the new ethics of our societies.
- **Individual life courses** will change, both professionally and personally, as we recognise our personal longevity. Individuals will have to rethink their own personal life courses and when and how they wish to mix education and work
- The **labour market** will face increasing skills shortages and a large proportion of older workers, and adapt to train and retain older workers. New cohort will expect and demand increasingly flexible working patterns. Home is likely to develop as a place of work, education and health care.
- **Societal structure and organisation** will need to change to keep up with the new demographic reality. We will move increasingly into second, third and even fourth partnerships with extended families of a complicated and demanding nature. The family as a supportive environment will change, though how is unclear. Communities will change both spatially and socially.
- **Social and economic behaviour will adapt.** Consumption will vary between ages groups and generations and will not be the same as previous generations People's disposable income will need to be distributed between increasing leisure, education, health care, mobility, and other demands.
- **Infrastructure and services** such as housing and transport, education and health care provision will need to adapt to a large percentage of older adults. needs and capacities.

What is the extent of educational 'influence' in this area – to what extent can educational systems impact on these trends?

There is already considerable research on the relationship of education and fertility, of education and mortality, morbidity, and health, and of education and migration. We know for example that there is a positive relationship between education and falling fertility and mortality, and that education can both encourage (through providing highly skilled migrants) and deter (through reducing poverty induced re-location) migration. If required this information could be brought together and reviewed in a systematic manner. We would also need to ask why the UK government should wish to use education to influence demographic trends, for what demographic outcome.

II.2 Focused Questions

These focused questions and contribution to thinking are discussed in the implicit context of how educational goals and processes might be affected.

Focused Question 1: Who will be the future learners over the next 15-50 years?

Ageing societies require the transfer of educational resources between young and old. There is a concern that in using national resources for education and training for older people, we may be penalizing the young. However there are demographic and societal reasons for such a transfer in resources. As the UK, like the rest of Western Europe moves to over half its population aged over 50 by 2030, so there will be a general transfer of resources from younger to older populations, which will include health, education, housing, employment etc. This will be matched by changing societal needs, as individuals adjust

both to the reality of longer lives, and to the fluid life courses which are emerging at the same time.

- Life long education of adults will move to the fore along side early learners, and the division of education along chronological age lines will blur.
- Education is likely to be a mix of formal group teaching (akin to current early learning in schools and universities), self-promoted learning using information and media technology, community learning, work-place learning and skills development.
- It is likely to be pluralistically funded by individuals, communities, employers, governments, private enterprise.
- The separation of education to enable personal development, to enhance employability and career progression, to develop skills, and to successfully contribute to wider society is likely to disappear.
- Education is likely to continue through-out the life course enabling individuals to draw on a portfolio of options to enhance personal development.
- The role of "qualifications" will need to be re-examined.

In addition, all learners across the age spectrum are likely to be more technologically adapt. Already younger cohorts are using digital and information technology in a very different manner from their parents, employing it in their educational, social and work activities. The role of technology within education provision is likely to increase dramatically.

There are current concerns over the role of migration and immigration and the special needs of new migrants: In particular there is current acceptance that people from different cultures may have expectations of learning that are very different from the traditional British experience. Education currently can play a key role in

- The arrival and integration of new migrants
- Employability
- Recognition and updating of qualifications
- Cultural and social adjustment
- Social integration and cohesion

However, given the likely tremendous increase in international migration for all, it is likely that many of these challenges will have disappeared and or changed by 2020-70 as we move into a more mobile and more culturally integrated world. It is likely that individual preferences and experiences will dominate the learning experience, need and demand, as with other groups. Thus ethnically diverse groups will benefit from the general more flexible models of education that we have highlighted. In addition, the UK can benefit from the concept of 'intercultural learning'.

Focused Question 2: What about supporting learning across and between different age groups?

The new demography and new social forces are likely to result in a new equivalence of life long education of adults alongside traditional early learners. While there will always be a demand for formative education, it is now recognised that the education of adults, including older adults, is both intrinsically important and important for society as whole. Education gives people the chance to face the rapid changes in society, in the labour market (particularly through skills upgrading) and in their personal and community life. It enables them to participate in complex democratic societies on all levels, and gives society a chance to pursue its social and economic development supported by socially integrated adults of all ages.

Focused Question 3: If 50-70 year olds are needing to work, if patterns of work are very flexible and changing, what sorts of learning are going to be required, how do we do it and what sorts of examples are there?

Europe is now moving into a period of redefining late life work as governments, employers and workers begin to come to terms with the implications of demographic ageing and the far reaching implications this will have for institutions and individuals alike. There are now growing moves to recruit, retain and retrain that generation of men and women in their 50s and 60s who are increasingly being seen as essential to retaining Europe's economic competitiveness as the upcoming skills shortage washes across the region.

While some argue that the requirement for new skills, particularly abilities in information and communication technologies, increasingly excludes older workers, it is also clear that technological innovation and flexible working patterns will increase opportunities for older workers. Indeed, the inherent training component of new technological labour means that future cohorts of older workers will have experience of continual training and skills updating throughout their lives. Supplemented by vocational and life long learning, adult education and training, this will significantly enhance the employability of older people and address upcoming national skills shortages.

- It is important that such education and training is targeted, builds on previous experiences and skills and is properly evaluated.
- It is important to engage the business community in this, and to do this, far more research and evaluation of the effectiveness of different types of life-long learning and training is required from a business perspective.
- Move from classroom training in the workplace and already rapid growth in "desktop" training for all employees using CD-ROM, videoconferencing, the Internet and electronic performance support.
- Shift from trainer led training to employer led training with trainers as "enablers"; work related education to create interventions that allow employees to decide what to learn and when to learn it, employing user-driven technology such as multimedia training, training technology and performance support systems.
- Use of technology to provide training and (technology-based training) and to support workers' performance on the job through electronic performance support systems (technology-based support) – it is likely that both will play an increasing role, not just in the work place but across all educational activities.
- Wide range of technology to provide both technology-based training and technology-based support: computer software, CD-ROMs, videoconferencing, computer networks, multimedia training technology and performance support systems.
- Trainers role is changing – trainers need to become supporters and enablers, particularly when dealing with an older experienced workforce.
- Growing role for Human Resources to move to employee-dialogue approach, whereby employee is positively encouraged to identify training and skills updating needs.
- Some European countries already operate study leave schemes allowing employees to return to full or part time education or training.

Focused Question 4: What role might developments in digital and bio technologies play in both demographic change, and in educating for diverse or changed populations?

1. Education

New technologies are already playing an important role in educating a diverse range of employees in the corporate world. These need to be considered as tools for enabling education across the life course for all in the community and home as well as the workplace. Consideration should be given to:

Technology and training delivery

- Electronic on line training with on-line certification

- Videoconferencing allowing simultaneous video and audio interaction between multiple participants across the globe
- CD-ROMs providing interactive video and audio capabilities, easily used by all ages, and which enhance learning and retention
- Local area network (LAN), wide area network (WAN), or "Intranet" learning

Technology to enhance learning

- Electronic performance support systems (EPSS). These are electronic tools that enable individuals to access support, coaching or information to perform better. These systems have considerable potential in for other education activities. EPSS are being seen as making significant impact on productivity, performance and employee learning in the world of work.

This area is likely to develop rapidly over the next few decades with real potential for education.

2. Capacity change and enhancement

It is likely that advances in two specific areas of bio-technology will impact upon demographic change and education.

- Radical longevity
- Brain ageing and capacity change

Radical Longevity

The predictions are based on incremental longevity. Consideration would need to be given to the impact of significant advances in radical longevity, not just in maximum life span, which would have a minor impact on demography, but in the normal life span for all individuals. However, so long as this radical increase in longevity was accompanied by a corresponding increase in health life expectancy, the overall effect would be a general extension of adult activities – more time for education, work etc, rather than necessarily a fundamental shift in the amount of time spent in any one activity (i.e. this would not necessarily mean increased in retirement or post-working life).

Brain ageing and capacity change

Cutting edge advances in bio-medical science via neuro-imaging and bioinformatics are transforming our understanding of the ageing of the brain and subsequent changes in capacity, and interventions to modify these processes. There is increasing evidence that the rate of functional decline in late life is highly variable. It is clear that some individuals accumulate more 'health capital' than others in early life; and that similar variations are found in the rate at which this 'health capital' depreciates in middle life. We are now beginning to understand the accumulation and de-accumulation of such "health capital" in the brain.

- Neurogrid enables identification of age and illness-related brain changes at the population level using both existing and future large-scale neuroimaging (magnetic resonance imaging, MRI and magnetoencephalography, MEG) studies.
- Detailed information has emerged about the molecular and cellular basis of core functions of the brain that provide the physical substrate for brain involvement in autonomic, endocrine, sensory, motor, emotional, cognitive and ageing processes.
- Advances in bioinformatics and computational modelling, provide the opportunity to address the bigger picture of how the brain changes with age.
- Cognitive enhancement to amplifying or extending the abilities of the mind through internal or external hardware or software is progressing; as cognitive neuroscience has advanced the range of potential internal enhancement, treatments have increased as well as the availability and power of external hardware/software support.

These advances will be essential to understand how capacity changes with age across the life course, and how new educational technologies can best be harnessed to provide education across the life course.

II.3 Contribution to thinking

UK policy on education has been developed in the context of a traditional pyramidal population structure, and linear life courses, which result in a large investment by the individual in early years formal education, and a rapid decrease in such education in young adulthood. Population ageing identified above, resulting in mature societies and elongated active lives for a growing number of the population, leads to the challenge of devising education for the new demography – both individual and societal. A new framework is required to cope with the following issues:

1. Education 2020-70 will combine
 - Formative education
 - Education as a lifestyle-choice
 - Education to enhance employment prospects
 - Education to enable full citizenship

Formative education: there will still be a requirement for structured formative education, but increasingly here there will be a mix of “teaching” and “group learning” with self-promoted learning using information and media technology even for the very young.

Education as a lifestyle-choice: new technology enables the blurring of leisure and education, education becomes a life-style choice enabling mental enhancement and enjoyment. As the relationship between mental capacity and physical health becomes clearer, so education will form a growing element of personal enhancement. Research indicates that mental development, brain capacity, and longevity are closely associated, so education contributes to an active healthy life.

Education to enhance employment prospects: our traditional thinking of skills upgrading and employment will change. As new cohorts enter the workplace, they will increasingly be accustomed to regular/continual skills upgrading to keep pace with technological developments and demands. This form of education will become an essential requirement of the modern workplace, and its provision needs to be negotiated between employers, governments and individuals. Employment related education of the future will increasingly focus on language, life skills, and the global arena, to enable full mobility of highly skilled individuals in an increasingly open international labour market.

Education to enable full citizenship: this will be required to enable people to cope with complexity of life, to plan their lives, and to care for others. Modern complex democratic societies will not be able to function without well educated individuals at their centres. New inequalities will arise between those who are educated into modern living, and those who do not have the skills, knowledge or capacity to cope with these new demands and ways of interacting, contributing and behaving.

2. Education 2020-70 will need to address certain myths and assumptions within society which may deter and restrict the development of fresh thinking about the nature, role and organisation of education.

- **Life long learning and adult education cannot be developed within standard models of delivery but requires more flexible approaches.** Older adults are more diverse than younger adults. Alongside standard variables of gender, class, ethnicity etc, older people have accumulated a variety of other biological, psychological, historical and social attributes which are unique to their personal life histories. This will structure the resources they have access to (social, biological, cultural, mental and economic) and the frameworks within which they make decisions.

- **Mature societies are not societies of old people burdened by providing health and social care to frail elders.** UK government policy has tended to think of demographic ageing as leading to large numbers of old people, rather than large numbers of people who are simply living longer, many of whom have increasingly active healthy lives. Conceptualized in this way, mature societies provide the opportunity for the first time for multi-generations to live and work alongside each other, contributing their own experiences and expertise. As people age throughout their lives they accumulate a wealth of experience, knowledge, skills, memories, wisdom and creativity. Life long education opportunities provide for this wealth to be distributed throughout our society .
- **Mental capacity does not necessarily decline with age, and almost certainly not until late old age for most adults.** Research suggest that fluid intelligence (ability to carry out higher level cognitive functions) may decline from the mid-60s, though not at a standard rate, and possibly due to lack of use; while crystallized intelligence (acquisition of new skills though education) continues to grow throughout adulthood. Indeed, it may be that reduced mental activity among current cohorts of ageing adults - in part due to lack of new mental opportunities and activities, and lack of focused training and educational opportunities - actually contributes to apparent decline in mental capacity in later life.
- **Few physical capacity changes are directly related to age.** Most are heavily influenced by environment and life style. Those that are age related, such as sensory change can be adapted for through aids (declining eyesight and glasses etc); others through a change in the physical environment. There is thus little to deter an individual from taking part in and benefiting from educational activities throughout their lives.
- **Education does not end with formal schooling.** There is a large demand for life long learning, both in the community and work place. Increasingly individuals recognize that education does not stop when they leave formal schooling. There is substantial evidence that adults of all ages wish to learn, are interested in new technology, and keen to upgrade their skills base. This is likely to increase with future cohorts.
- **As we age we do not wish to withdraw from our communities and societies.** Adults of all ages wish to contribute to society –through work, voluntary activities, through their families. HSBC
- **As we age we need different learning environments** based on both our changing experiences and capacities with age, but most importantly the cohort effect of how we learnt in the first place.

3. Education 2020-70 will need to operate within a flexible framework.

4. Education 2020-70 will face different cohorts with different expectations and skills. Populations of the future are likely to self-organize their education. The growing availability of technology, including the potential spread of self-training via intra net and internet systems means that individuals will increasingly decide what, when and how to educate themselves.

The key questions here are

- What will be the role of government in future education?
- Should governments have a role in deciding what individuals learn across the life course?
- Who will identify key life skills and how these should be delivered?
- In the world of new technology will the state have any role in guiding either formative or life-course education?

III Methods

This section addresses Appendix C: 3, 5-11

III.1 Experts

A multi-disciplinary approach would be adopted to which drew on four broad constituencies:

Education

Information, media and digital technology

Bio-technology

Demography and social change

Academic and User groups in Adult and Life Long Learning (age and ethnicity)

Odysee, Netherlands; [Acefir](#) (ES); Društvo za izobrazevnaje za tretje zivljenjsko obdobje, Slavina; [Znanie Association](#) (BG); [Bundesarbeitskreis Arbeit Und Leben](#) (DE); [Inrca](#) (IT); Cmt Prooptiki ltd. (GR); Age Action Ireland; DaneAge (DK); NIACE, UK, Network for Intercultural Learning, Europe; PEFETE (Pan-European Forum for Education of the Elderly). Centre for Intercultural Learning.

Key players include for example:

Dr De Clerk, Chair of PEFETE

John Field, Professor of Lifelong Learning, University of Stirling

Bob Fryer, National Director for Widening Participation in Learning, Department of Health.

George Leeson, University of Oxford and PEFETE, and formerly DaneAge

Leisha Fullick Institute of Education, University of London and Learning and Skills Council,

David Sherlock President of NIACE and Chief Inspector of Adult Learning in England from 2000 – 2007.

Stephen McNair, NIACE

Lord Leitch, : Leitch Review of Skills

Tom Schuller, Commission of Enquiry into Future of Life Long Learning (formerly CERI, OECD now NIACE)

Cognitive change and enhancement

Neurogrid, Centre for Ethics in Medicine, Bristol University, Oxford Uehiro Centre for Practical Ethics, Stockholm Bioethics Centre, ENHANCE Network, EU; Brain and Behaviour, Maastricht University – drawing on the expertise of players such as

Dr Anne Aimola-Davies, Neurophysiology, Oxford

John Gedes, Psychiatry, Oxford University

Julien Savlaescu, Oxford University

Harry Steinbusch, Maastricht

Information, digital and media technology.

We would draw on the Oxford e-science institute, the e-horizons project and the e-research group at Oxford to identify key players in this area. The Oxford e-Research Centre will be crucial here. builds on the achievements of the [Oxford e-Science Centre](#). Through the application of innovative computational and information technologies the OeRC is developing a role in the education and training of students in the use of advanced computing and information technologies. It also provides a natural interface with industry. Other key players include the Education with New Technology (ENT) at Harvard University.

Demography and social change

The demographic context would be written by OIA experts and reviewed by specific experts such as Lutz (fertility, Vienna), Coleman (migration, Oxford), Leeson (migration and ageing, Oxford), Harper (social change and ageing, Oxford), Howse (life enhancement and ageing, Oxford) Heath (ethnicity, Oxford), Kirkwood, (bio-demography, Newcastle), Olshansky, (bio-demography, Illinois), Steinhert, (bio-demography ,Oxford), Austed (bio-demography, Texas).

III.2 Methodology

The methodology would employ focused and more general workshops and expert interviews. These would cross cut across both research, policy and user groups and thus ensure both user engagement and credibility with key project stakeholders.

Evidence would be collected from both interviews with experts and focused workshops. These would have four broad aims

- To identify key changes in the area
- To identify key challenges in the area
- To identify future uncertainties
- To identify areas of greatest potential interest and greatest added value

From this the experts at the OIA would gather new robust evidence to provide new perspectives on the challenge.

The components would include

- Interviews with experts from the research, policy and user community (examples above)
- Workshop 1 on longevity, technology and capacity change
- Workshop 2 on technology education and work
- Workshop 3 engaging adult education experts in the community and workplace to engage with thinking emerging from two technology experts.
- A review of European models of life long learning.

IV Tasks and activities

- **Contact experts for interview, invite participants to workshops 1 and 2** : these lists would be identified, refined and selected drawing on our already list of experts to expand this.
- **Expert interviews**: these would be undertaken both in person, by telephone and video conferencing. They would be recorded, transcribed and used as the basis for selecting workshop participants.
- **Desk review**: this would cover relevant literature and would be expanded in the light of the interviews and workshops
- **A review of European models of life long learning** This will use comparative material and selected interviews with the four regions of Europe to understand the possibilities for the UK. In the Nordic countries new initiatives are embedded in the social welfares structure; In the west part new initiatives are strongly based on new partnerships between social organisations, local authorities and enterprises; in the south there is a mix between family based learning and social volunteering and a growing interest from local communities. In the eastern part we see new developments in establishing new forms of non-formal education related to democratic participation structures. The challenge is to learn from each other in order to set up new partnerships and alliances, and to develop attractive and democratic infrastructures for participation in society. The review will consider the use of new technology and the internet in doing this.
- **Workshop 1 technology, longevity and capacity change** the focus of this workshop would be to gather 10 to 15 key players from academia, policy and users in the area of understanding life enhancement, longevity and capacity change to explore the potential for both expanding the breadth and depth of education and technology increase our capacity to learn, and also to explore the reality of lengthening lives and possible enhanced brain capacity (or actual decline) in later years.
- **Workshop 2 technology, education and work**: the focus of this workshop would be to gather 10 to 15 key players from academia, policy and users in the area of understanding the new technologies; the changing ability of technology to enhance both our educational and working lives; and to consider how changes in one arena will impact upon changes in another, and how work and education may increasingly come together through technology.
- **Workshop 3 technology and learning across the life course: key players** from the first two workshops would be invited to interact with experts from the fields of education and life long learning. Again a mix of academia, policy and users would be aimed for. Drawing on the fist draft report written by the team and on key papers written by selected experts, the workshop would aim to focus down the debate to provide new perspectives on the challenge.

- First and final reports: the first report would draw together all the evidence thus collected and provide the discussion document for workshop 3. The final report would be rewritten in the light of workshop 3.

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