EDUCATIONAL PLANNING IN THE AGE OF DIGITISATION

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ABSTRACT

Numerous and ingenious ICT devices and systems are being applied at various locations across the educational landscape, often with interesting consequences. Such piecemeal, add-on approaches are, however, increasingly inadequate and progressively inappropriate. Given that digitisation has profoundly transformed both the objectives of education and the means of their achievement, the requirement from now onwards is for an all-embracing and visionary strategy matching and embodying our entirely altered environment. Essentially, humanely-inspired and digitally-comfortable educational planners should creatively ponder upon how best entirely to re-structure the whole of education in order to serve and help shape our utterly-transformed and ever-evolving world. Education planning should no longer focus on formal education only, but also on informal learning. By such means may much more equitable, ethical, enjoyable (and far less economics-bound, test-oriented, world-of-work-dominated) systems be created. Specifically, educational planning now means 'educational planning founded upon digitisation for the Digital Age'. This paper explores the implications of this ground-breaking reality.

INTRODUCTION

Whether it be a one-teacher school in Northern Alberta, a technological university in New South Wales or a national education system in Sub-Saharan Africa, the basic educational planning task is identical: to mobilise available resources in order to achieve the agreed (or implied) objectives in a pleasurable and stimulating setting. Digitisation has changed, and is continuing apace further to change, both the nature and aspiration of those objectives and the means and enjoyment of their achievement. The society within and into which the teachers operate and the learners are moving has altered radically – and will be characterised by on-going alteration. Similarly, the ways in which the transmission of information and the sharing of ideas and the stimulation of creativity may be achieved have altered pivotally.

With digitisation, a fresh educational era has arrived and we should no longer simply be talking and planning in terms of Information and Communication Technology (ICT) assisting ever more outmoded approaches and arrangements. In a sense, there is now the one universal school – the global lifelong learning community (Uys & Douse, 2017). Assuredly, much more learning will be self-directed and, equally indubitably, teachers' functions will alter profoundly, taking on 'concierges of learning and escorts to wisdom' roles. But, in another sense, education will forever be characterised by the guided and encouraged acquisition of fascinating knowledge, of stimulating ideas and of deep understanding, within a convivial environment, fostering creative self-fulfilment and communal well-being. *Plus ça change, plus c'est la même chose*. Accordingly, with heads in

the cloud but with feet firmly planted upon *terra firma*, this paper re-examines educational planning – taking the national context as the starting-point model – as it is presently and as what it can and should now become – with digital participation across national borders – in order effectively to serve and be served by this emerging Digital Age.

EDUCATION IN THIS DIGITAL WORLD

Many dramatic descriptions have been drawn and multifarious fantastic forecasts fashioned. The virtually worldwide recognition that everything is transformed has yet to be matched by any fundamental reshaping of educational structure, curricula, content, culture or philosophy. We are now undoubtedly in VUCA circumstances, characterised by volatility, uncertainty, complexity and ambiguity (to utilise Lemoine's acronym of 2016), exemplified by (almost) universal digitisation. The Ford Focus of one the present authors has more microprocessors than had the university where he taught in the early 1960s (and other scholars, with larger vehicles – albeit briefer careers thus far – have made similar observations). The young inhabit – indeed own – a digital world embracing social interaction, entertainment, gaming, music, pictures, information gathering and friendships and, as Yeats put it, 'This is no country for old men', at least in terms of antediluvian self-perceptions.

The World Economic Forum founder tells us that "…we stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another… in its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before" (Schwab, 2016). Previous industrial revolutions have led to increased inequalities and amplified imbalance: the First using water and steam power, the Second using electric power, the Third using electronics and information technology and none using workers as partners. As he points out, "We do not yet know just how (the Fourth) will unfold, but… one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society" (Schwab, 2016).

As the Director of UNESCO's International Institute for Educational Planning put it: "there has not been one ICT revolution but five – so far – namely (i) The Computer; (ii) The PC; (iii) The Microprocessor; (iv) The Internet; and (v) Wireless Links (Hernes, 2002). As Dr Hernes expounds: "the passport to world citizenship has become '@'." The realisation that this development is much more than mere devices implies that it should be regarded not as a sixth ICT revolution but as a time-shift into a fresh revolutionary dimension, characterised by a surge beyond ICT: less technological, much more a matter of consciousness. While such a transformation has many roots in current realities, it also possesses the power to create capabilities for flexibility in learning for a largely unknown future.

This thoroughgoing surge forward represents a pivotal leap in human potential as profound as the wheel in relation to development and as significant as the book in the context of education. Industry, commerce and academia, worldwide, urgently require relevantly skilled or readily trainable workers, looking in vain to traditional education systems to deliver them. Computer hardware production exemplifies globalisation, just as satellite-enabled communication manifests the worldwide integration of labour. Indeed, labour is following capital (but not land) in becoming universally mobile (walls and seas notwithstanding). This does not necessarily involve physical migration, as workers may cooperate across hemispheres. Educational planning, including investment

and expenditure, may – nay must – be now conducted in the context of creative interaction across nations, continents and oceans. The participative connectedness of all learners is something more than enabling development: it is development. But it has yet, with universally-enhancing, equity-accomplishing and profoundly humane consequences, to occur.

Recognition of the magnitude of on-going and future economic and labour market changes, within the broader context of personal and socio-cultural actuality generally, necessitates transformations in the objectives, content and approaches of education. Education cannot explicitly prepare people for situations in which they will need frequently to upgrade their skills, especially when the nature of those skills are unknowable. Rather, the love of learning and the ability to learn, to handle information expertly (i.e. information literacy) and to master digital tools are the competencies required. Moreover, citizens/ consumers/ workers/ people the world over will participate in, influence and enjoy the multifarious and largely unforeseeable experiences that will undoubtedly occur. Planners will need to raise their game in order to envisage, delineate and prepare for whatever a well-rounded education in this Digital Age consists of. Starting from where we are now and moving hesitatingly and inchmeal more or less forward is the wrong response, just as regarding education as mere 'preparation' has always been dangerously misguided.

It is relatively easy to recognise that digitisation changes everything – but more difficult to understand just what, in practice, that means for education and its planning? Given that all learners and all teachers worldwide are now in contact with one another, what are the educational implications and how may they best be met? Some of the many possibilities, as developed at a recent conference of educators, are presented in the box below:

LIVE LANGUAGE LEARNING… SHARED ASTRONOMY PROJECTS… GLOBAL CONFUSION… DATA-DRIVEN EDUCATIONAL ECONOMICS RESEARCH… INTER-CONTINENTAL DEBATES… WORLDWIDE MATHS COACHING… COMPLEX DIGITAL DANGERS… PLAGIARISM AND CORRUPTION… ONE GLOBAL STUDENTS REPRESENTATIVE COUNCIL… PERSONAL TUITION BY TIP-TOP EXPERTS…   MULTILINGUAL DRAMA… SHARED PHYSICS EXPERIMENTS… GLOBAL WARMING EVIDENCE… ASTRONOMICAL COOPERATION… CHAOS… GEOGRAPHICAL FIELD TRIPS WORLDWIDE… CHESS BETWEEN NATIONS… VIRTUAL GALLERY AND MUSEUM VISITS… MANY MORE MOOCS… FULLY-PORTABLE LEARNER RECORDS… COORDINATED RESISTANCE TO EDUCATIONAL INEQUALITIES… LOW-COST ONLINE TUTORING… NEWTON'S LAWS THROUGH VR HEADSETS… OUTLAWING OF LAWBREAKING TEACHERS… OPTIMAL SCHOOL TIMETABLING… BESPOKE ROUTES FOR EXCEPTIONAL STUDENTS… INTER-CONTINENTAL CHOIRS… FREE ONLINE TRIALLING OF CLASSROOM TECHNOLOGY… IMMEDIATE TRANSLATION FACILITATION… MONOPOLISTIC ONLINE DOMINATION… CODING FOR PRE-PRIMARY CHILDREN… INTERNATIONALLY-COACHED SPORTING TEAMS… SAVINGS COMMUNICATION OVERLOAD… EXPERT ATTENTION TO SPECIAL EDUCATIONAL NEEDS… FREEDOM OF EDUCATIONAL EXPRESSION ACROSS FRONTIERS… WORLDWIDE CAREERS GUIDANCE… INTERNATIONAL CYBER BULLYING… CONCERTED ACTION TO OVERCOME EDUCATIONAL IMBALANCES… INEXPENSIVE TEACHER EXCHANGES… ENHANCED ENVY AND JEALOUSY… SHARED PARENTAL CONTACTS… REALISTIC HISTORICAL SIMULATIONS… MENTAL HEALTH COUNSELLING…   SPLENDID CHAOS… PRIVATE ONLINE ASSESSMENT SYSTEMS… MUCH MERRIMENT… **UNIMAGINED OPPORTUNITIES…**

Figure 1: Responses to the question: 'What would the educational implications be if all learners and all teachers, everywhere, were able to communicate with one another, easily, instantly and inexpensively?' as posed at the UKFIET Conference, Oxford (Uys & Douse, 2017).

Each suggested implication – along with others that may readily be predicted – merits attention; the concluding **BOLD** one of 'unimagined opportunities' sums the entire list up.
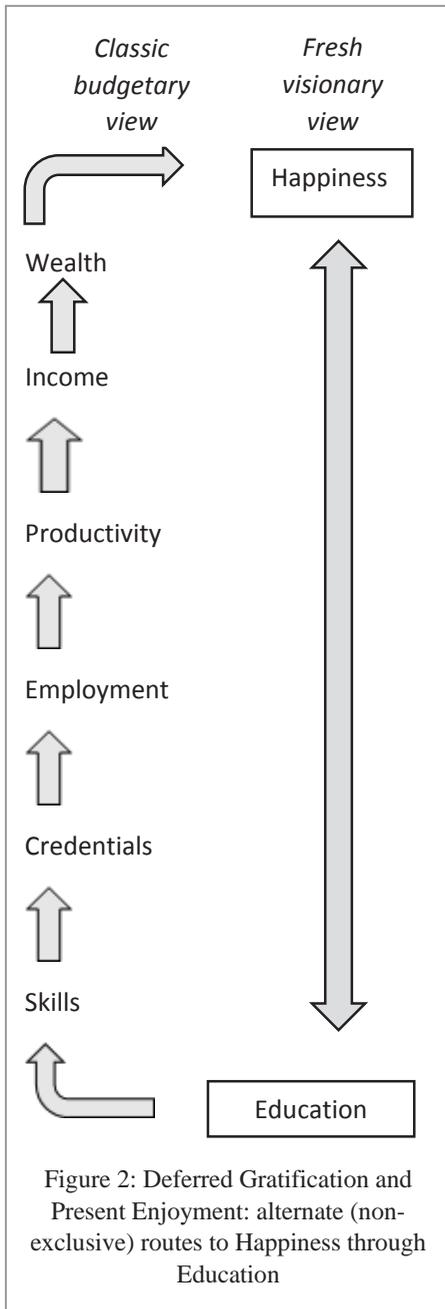
ECONOMICS, EQUITY, ENJOYMENT AND ETHICS

Educational planning as practised to date, has predominantly been an economic exercise, admittedly with educational content but constricted and defined by local resource parameters. While it is the case that "many public policy decisions in education are influenced by concepts of equity and human rights on the one hand, and by the concept of education as an important ingredient for economic development on the other" (UNESCO, 2011), the constraints have tended to be budgetary rather than visionary, 'how much is in the purse?' as opposed to 'how best may we lead all learners out?'. While human capital theory has fallen thankfully into well-earned disrepute (Curtin, 1996) there remains in some influential corridors an irrational faith in education being not so much "…good for both individuals and the society at large" but more a matter of "…enhanced public expenditure on education as an investment for the future… (the foremost) justification for multilateral and bilateral aid to education" (UNESCO, 1970).

Digitisation throws that traditional ordering of priorities into welcome disarray. Present-day education, embodying contemporary technology in its connectivity, organisation, curriculum content and research, and in innovation, learning methods and management, presently seeks to provide trainable graduates for the rapidly evolving requirements of commerce, industry and civil society. Some, allowing schooling to be mistaken for the development of marketable skills, advocate that it should do more than that, welcoming the workplace's colonisation of the classroom. However, given that tomorrow's labour market skills demands are increasingly characterised by uncertainty, the vital distinction between 'education' and 'training' may valuably become a hard border.

The aims of the former may include, at the very most, a 'readiness' for the latter and, more desirably, be recognised as something worthwhile and enjoyable of itself (Douse, 2005), guiding learners to

Figure 2: Deferred Gratification and Present Enjoyment: alternate (non-exclusive) routes to Happiness through Education

Classic budgetary view — Happiness ← Wealth ← Income ← Productivity ← Employment ← Credentials ← Skills ← Education

Fresh visionary view — Happiness ↕ Education

developing life-long and life-wide capabilities. Above all, the myth of educational input being justified by economic returns is exploded with the realisation that education's true objectives are mainly non-material. [As depicted in Figure 2, if investment in education is ultimately justified by a four-stage route to human happiness, it seems irrational to ignore the more immediate opportunities for enjoyment that offer a more direct vindication.] Causal links between schooling-years and economic growth have always been unconvincing – in the Digital Age, with an abundance of free digital, global courses and resources and formal and informal learning, all such speculation may cease.

Most education plans, and educational sections of national plans, emphasise the inclusion of all learners, full- and part-time, on-campus and distant, irrespective of age, gender, beliefs, abilities or disabilities. Similarly, most development partners provide especial support in terms of access and full educational participation for those in less developed countries, fragile and post-war societies, and countries in transition, ethnic minorities, and for women and girls, those with disabilities and disadvantaged groups generally. Yet education, as presently practiced, is the enemy of equity. At the slogan levels, diversity is delightful and inequity abhorred. In practice, and in educational institutions and processes everywhere, categorisation and rejection are rife: 'meritocracy', originally coined as a derogatory term, is deliberately embodied in many national plans and educational practices. Enforced 'student selection' may now thankfully be discarded to the scrapheap, along with that damaging oxymoron 'educational economics', as learners participate digitally and informally in global educational opportunities.

Digitisation both necessitates and makes possible a change in the organisation as well as access to and the delivery of education, offering the potential to equalise learning opportunities and outcomes in favour of economically and/or demographically/or otherwise disadvantaged communities. It may, with much creativity, genuinely support inclusion and diversity, just as it may, with care, be utilised in safe and ethical ways and, indeed, become a network for altruism. However, while the internet is a marvellous medium for international munificence, good deeds are not enough. The ongoing digital revolution offers new intrinsic opportunities; it dramatically changes what can be learned and by whom. Welcoming all learners irrespective of background, gender, previous knowledge, age or other such factors, to the lifelong global school offers much potential but poses many fresh challenges for educational planners, involving getting beyond the slogans and being judged by practical consequences.

This raises the broader question of equity, within countries as well as between countries, particularly between the industrialized and developing world. There are optimistic theories about development – about a great technological bound forward or about latecomers' ability to leapfrog generations held back by already outdated technologies. Pessimists affirm that the vast divisions between rich and poor will always be with us, in power relations as well as in wealth and income. While inter-national leapfrogging cannot occur within current conceptualisations, perpetual inequity is neither inevitable nor acceptable. As an integral element in planning for a great digital-based leap forward, the inequalities and injustices within and between nations must be a major consideration as the global school requires basic access to digital technologies and an ability to use these. And, within education, the humane vision should be embodied in systemic, school and classroom arrangements. As a forthcoming World Bank Group (2018) report makes clear, the 'learning crisis is a moral crisis' and overcoming digital as well as other disparities will "better equip people to solve real world problems in their communities and beyond" (Broadband Commission for Sustainable Development, 2017).

ICT has been perceived – all too often accurately – as over-expensive. With the creative application of ubiquitous and relatively-inexpensive hand-held (i.e. mobile) devices connected to the "cloud" or with pre-loaded content and systems, a long-overdue move away from high investment solutions may and must eventuate. Most products, services, models, expertise and research related to ICT use in education have until now come from high-income contexts and environments and, consequently, 'solutions' enabled by technology have been imported and 'made to fit' in environments that are often much more challenging. That expensive, imported response is now redundant just as the machinery is obsolete. Digitisation is, essentially, cost-effective enabling the equitable access of students as consumers and an equitable provision of content. That realisation will inevitably have profound consequences for educational planners (and development partners seeking to support national educational policies and plans). No longer should any well-meaning donor, still entrapped in the 1990s, offer to provide 'computer rooms' or powerful 'desktops for all'.

Central coordination and planning can facilitate effective use of digital manufacturing technologies in schools (Bull, 2016). Digital textbooks may serve as the bases for traditional face-to-face classes, online courses or degrees, or for Massisve Open Online Courses (MOOCs), offering lower costs, effortlessness (compared with hard copy textbooks) for learners to carry around, easier for teachers to monitor learner progress, and allowing simpler and cheaper updates as needed. A Bring Your Own Device (BYOD) approach could become feasible across the developing world through well-planned investment, in the pedagogy and curriculum as well as in some future-proof technology. Assuredly, enabling all learners in educational institutions worldwide to achieve full internet and cloud participation (by say, 2020) will have substantial cost implications, and it is recognised that mobile access can be a considerable expense for those in developing settings! It is recognised too that a majority of the world's primary and secondary schools are without electricity, but manually operated computer systems are available in the imterim. Even more so, it is recognised that, if such fundamental inequitable deficiencies are not addressed and remedied, the world's underlying problems will never be solved. This may well have economic justifications but the moral ones are immediately evident – and educational planners cannot avoid confronting such issues.

DIGITAL LITERACY, UNDERSTANDING AND COMFORT

Considerable attention has been given to the nature of 'digital literacy' (or indeed 'digital literacies' (Lankshear & Knobel, 2008), with talk of "digital skills, digital fluency, digital capabilities, digital competencies, digital intelligence, and so on", not to ignore the earlier use of "digital understanding" (Uys, 2017). The consensus emphasis is upon the 'digital agency' of individuals in terms of their development as digital citizens and digital workers (All Aboard, 2015; Beetham, 2017; Belshaw, 2015; Carretero, Vuorikari & Punie, 2017). As Bhatt reminds us, any attempt to define [digital] literacies need to be "…located as part of social practices and occur within culturally constructed instances or literacy events" (2017). Which brings us to Brown's thought-provoking three-part blog post which concludes that "…the goal of developing digital literacies is inextricably linked to enabling a greater sense of both personal and collective agency to help address some of the bigger issues confronting the future of humanity in an uncertain world" (2017). The New Media Consortium's Horizon Report (Alexander, Alexander, Adams Becker & Cummins 2016) sought to develop a shared vision of digital literacies, confirming that the literature is "broad and ambiguous, making digital literacy a nebulous area that requires greater clarification and consensus". While it is difficult (and unnecessary) to disagree with the observation "that there is no simple answer to the question of 'what do we mean by the term digital literacies?'" (All Aboard, 2015), this absence of closure should not be allowed to distract educational planners indefinitely.

For this is a delightful discussion, reminiscent in some ways of medieval disputes regarding angels and pins, but with limited practical implications. Just as the intersection between the philosophical aspects of infinitesimal space and the qualities attributed to seraphim and cherubim may (or may not) be made manifest to some or all of us *post mortem*, so also will the precise nature of required digital competence, at any particular pinpoint in time, become sufficiently clear for all practical purposes once that moment arrives. The objective is to be 'digitally comfortable', as probably most children are already, much as one might be a successful electrical engineer without being able to define (or indeed delineate) 'electricity'. Digitisation is not merely a coming-together of contemporary technologies – it is far more a confluence and synergy of possibilities for human fulfilment. Education cannot ever update anyone, teacher or learner, with the entirety of digital understanding at any moment – if, on rational bases, they feel 'digitally comfortable' and are 'at ease' in the digital world, then that is enough. Armed with that insight, let us proceed to consider educational planning, then and now.

EDUCATIONAL PLANNING: THEN

One searches the standard educational planning guides in vain for acknowledgement of digitisation as a central factor, let alone the recognition that any plan, policy or strategy failing to be founded upon digitisation may be regarded as obsolete. Neither UNESCO's consideration of the basic structure of plan documents (UNESCO, 2006) nor the Global Partnership for Education's plan appraisal guidelines (GPE, 2015) refer to digitisation at all [word searches for 'digital' or indeed 'ICT' draw blanks]. While this may be just about forgivable in respect of the earlier document, it is alarming in relation to current advice from a prominent educational funding channel conduit *cum* would-be trends-setter.

Similarly, advertising materials for training in 'Strategic Education Planning', from those who should appreciate the presence and promise of digitisation (see, for example, the International Centre for Parliamentary Studies website) offer to provide those involved with "a clear understanding of the necessary requirements, processes and considerations for establishing a well-resourced, well-regulated and equitable education sector, based on a realistic assessment of the available resources" but nary a mention of the digital dimension upon which all aspects of "developing, constructing and implementing strategic plans" are now embedded. Yet again, UNICEF is currently "commissioning a series of *Think Pieces* that aim to promote fresh and cutting-edge thinking on how to improve the quality of education in Eastern and Southern Africa" (UNICEF, 2017). A dozen topics are suggested – the fundamental digital component is not even implied in any of those, let alone as the basis for the overall initiative, once more exemplifying the 'ICT as optional extra' approach.

Generally, and with regard to national educational planning for developing countries, in terms of 20th century standard approaches to educational planning, the basic pattern is logical and (for the now concluding pre-digitisation era) understandable. Taking the UNESCO schema as standard, it may be summarized as illustrated:

Traditional Education Sector Plan Contents

I. SECTOR ANALYSIS: general context, system description, situation analysis (achievements, lessons, issues, challenges and opportunities: PEST and SWOP), stakeholder analysis;

II. POLICY AND STRATEGY: development objective and overall goals, specific objectives and strategy for achieving development objective, beneficiaries, institutional arrangements, major sub-programmes (or sub-sectors);

III. PROGRAMMES OF ACTION: for each sub-programme - programme objective (Statement and description of the programme), Components (Results > Actions > Inputs/ Resources);

IV. MANAGEMENT, MONITORING AND EVALUATION: governance and management, development coordination (government, donors, NGOs, private sector, etc.), risk assessment and assumptions, monitoring and evaluation

V. COSTS: recurrent and capital, disbursement schedule

VI. ANNEXES: input timing; output, outcome and impact indicators; responsibilities.

Figure 3: Current (Outdated) Education Sector Plan Contents

Perhaps the underlying impediment is expressed in the traditional truisms to the effect that "Strategic planning is based on the exploration of known or predicted trend … the ideal tool for… confronting innovations and disruptions" (Pisel, 2008; Hinton, 2012) and "Planning is a future oriented concept that incorporates past history, present performance, and future direction to achieve organizational mission and objectives" (Richardson, Jenkins & Lemoine 2017). Even the realisation that "Integrating technology into the educational process is not a simple, one-step activity. It is an intricate, multifaceted process that involves a series of deliberate decisions, plans, and measures" (Infodev, 2007) fails to rise to the contemporary occasion. The idea of identifying "educational areas for ICT intervention and formulation of corresponding ICT-in-education policies… planning for implementation— infrastructure, hardware, ICT-enhanced content, personnel training, and cost…" (*ibid*) misses the present point of the integrated Global School. All has utterly changed: the Visigoths are not just at the gates of Rome: they have occupied the Forum.

EDUCATIONAL PLANNING: NOW

Until recently, discrete 'ICT and Education' policies and plans have made good sense. This no longer holds true. Today's requirement is for Education Plans and Policies that absolutely acknowledge the centrality of, and are fully focussed upon, Digitisation. Those responsible for 'education' should embody in their mandate the recognition that 'education' now **means** 'education in the context of Digitisation' and that separate 'ICT and Education' documents (especially when developed in relation to the looming large-scale procurement of ICT equipment!) are meaningless, misleading, potentially dangerous, 20th century relics. Similarly, 'ICT in Education specialists' are now superseded by 'Education specialists', which title implies a confident familiarity with Digitisation and its educational implications: ICT has become transparent as it permeates everything that has been, and is "education". That is the key factor in optimising educational planning and management in the Digital Age – the realisation that the 'Digitisation of Education' is 'Education'.

Consequently, current calls for a "systematic, consultative process to formulate and policies related to, and plan for, the deployment and use of educational technologies" or even "a wider policy formulation and planning process that looks at broader developmental and education goals, and then seeks to investigate and articulate how and where the use of ICTs can help meet these objectives" (World Bank, 2016) miss the point and are no longer appropriate. Of course, as ever, education should be focussed upon the child [or, more generally but less evocatively, the learner – skills development starts at birth and is lifetime long]. Digitisation empowers that focus to be significantly more effective, just as it involves the world of that child/learner becoming more complex, challenging and, hopefully, enjoyable and fulfilling. Accordingly, the task now is to delineate and integrate aspirations, priorities, strategies, programmes, plans, activities, costs, inputs, responsibilities and M&E mechanisms for education in the Digital Age.

The notion of the global school embodies a recognition that the world has changed dramatically and, in at least two senses, for good. Happily but all too gradually, the abovementioned 'interesting ICT add-on' approach is fading as the recognition by far-sighted educationalists and decision-makers of digitisation being the basis of the entire educational endeavour gathers momentum. But, as emphasised above, let us not be carried away. Having recognised that the global school has come into existence, and having understood what that implies, involves and makes viable, the customary, realistic and widely participative educational planning process may proceed. But, throughout that involvement, there is a need determinedly to cease creating new policies related to technology use in education in favour of educational policies taking full account of Digitisation's central significance in relation to, and integrating, objectives, content and means of delivery.

Trucano argues that "technological innovations will always outpace one's ability to innovate on the policy side" (2012). But the educational planning focus should not be upon particular technologies so much as on what digitisation in general makes possible. Commence by agreeing upon the educational outcomes (with equity and enjoyment high on the list) and the development and distribution of the devices will keep pace of their own volition. The main difference between pre-digitisation educational planning and that which the evolving situation now demands is the necessary move from discrete ICT initiatives within an existing system to a transformed educational system founded upon a cohesive set of mutually-supportive and integrated digital applications.

The educational planner in the late-20th or early-21st century might well have asked: 'what is available to improve upon the ways in which we are doing things now?' As we have entered the digital age, the essential question becomes 'how best may our education system be re-shaped, through the integrated application of digitisation, to meet the ever-evolving requirement of contemporary society?' As illustrated:

Pre-Digitisation (Then)	Digital Age (Now and Forever Onwards)
Here is where we are now – how may particular ICT applications best enable us to go forward on a step-by-step basis?	From where do we want to start, to where should we proceed, and how may digitisation best enable that to happen, effectively, coherently and happily?

Figure 4: Pre-digitisation and contemporary educational planning starting-points

It is as if a revolutionary new building material suddenly becomes available. This manufacturer shows how it may be applied to window frames. Another demonstrates its use in chimney stacks. Yet another has perfected contemporary staircases. And then one far-sighted philosopher-architect exclaims: "Let us construct the entire house of this material!" while, a little while later, another calls out: "Let us re-shape our conception of the 'house' based upon this material's potential!" while yet another declares: "Let the entire town…". An entirely new paradigm emerges:

Digital Age Education Sector Plan Contents

I. DEVELOPMENT GOALS IN THE CONTEXT OF DIGITISATION: global understanding in a national vision i.e. "think global, act local"; social objectives, economic objectives, work skills objectives, consequent education sector objectives focussing upon equity and enjoyment – all in the context of digitisation;
II. EDUCATION SECTOR ANALYSIS IN THE CONTEXT OF DIGITISATION: effective connectedness of schools, managers, teachers and learners; teachers' digital understanding and ease; general condition of schools; formal and hugely growing informal learning; overall achievements, lessons, issues, challenges and opportunities in the context of digitisation; stakeholder analysis in the context of digitisation;
III. POLICY AND STRATEGY: development objectives and overall goals in the context of digitisation; specific educational objectives and strategy for achieving development objectives in the context of digitisation; enhancing enjoyment, quality and equity in the context of digitisation; cost/benefit improvements through the application of digitisation, beneficiaries, institutional arrangements, major sub-programmes or sub-sectors;
IV. PROGRAMMES OF ACTION: for example – curriculum development in the context of digitisation, learning materials and systems in the context of digitisation, continuing teacher development informed by global teachers in the context of digitisation, examinations and assessment in the context of digitisation; extracurricular activities, sport and recreation in the context of digitisation; for each – programme objective, application of digitisation, components (Results > Actions > Digital and other Inputs)
V. MANAGEMENT, MONITORING AND EVALUATION: governance and management, and development coordination (government, donors, NGOs, private sector, etc.) through the application of digitisation; risk assessment, assumptions, monitoring and evaluation, through the application of digitisation;
VI. ANNEXURE (including outcome, impact and sustainability indicators, responsibilities and indicative costs).
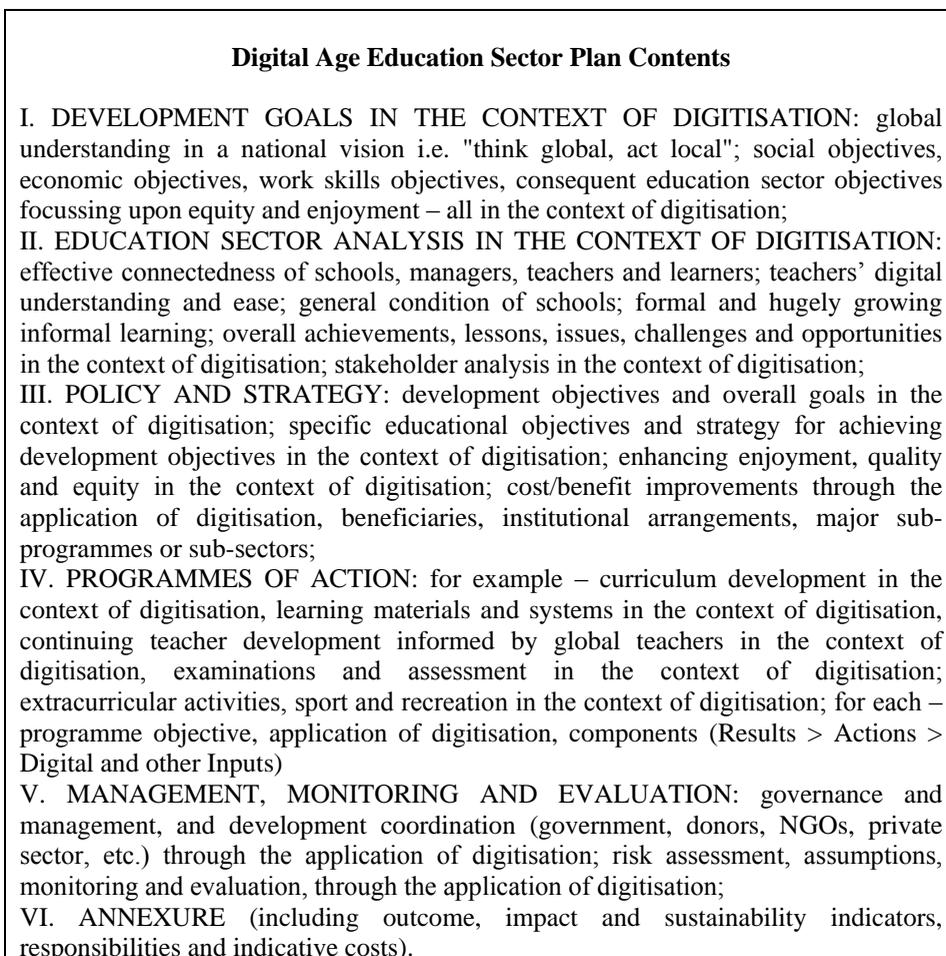
Figure 5: Indicative Education Sector Plan Contents in the Context of Digitisation

Once the notion of digitisation being at the heart of educational planning is embedded, the repetitive especial mentions will become redundant: everyone will know that, for example, 'curriculum development' means 'curriculum development in the context of digitisation' and those last five words will then be superfluous. Just as it is presently understood that 'swimming' means 'swimming in the context of water', without explicit mentions of that moist medium being persistently made.

Above all, there is a need determinedly to move away from efforts to create new policies related to technology use in education in favour of educational policies taking full account of Digitisation's central significance in relation to objectives, content, means of delivery and, above all, educational philosophy. The 'economics' is still there, right at the end, but the banker no longer runs the company.

APPLICATIONS IN SEARCH OF A FRAMEWORK

Major initiatives continue to embody the Add-On approach. Over recent decades, ICT has been applied not only in support of learning and teaching but also where education is being planned, managed, supported and measured. An archetypical instance is that of the **Educational Management Information System (EMIS)** and, with varying installation and maintenance experiences, sometimes involving the application of vast resources over several decades, EMISs are now being used to provide accurate and timely data to inform educational planning and policy development.

Another emerging example is that of **learning analytics**, the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs. It is regarded as a tool for (a) quality assurance and quality improvement; (b) boosting retention rates; (c) assessing and acting upon differential outcomes among the learner population; and (d) enabling the development and introduction of adaptive learning.

A variant of this, **academic analytics**, is used to develop strategies for learning and administration and to improve educational planning and management. It is also applied to identify at risk learners and to plan better interactions with them. Academic analytics includes learner profiles, performance of teaching staff, quality of course and subject design, and resource allocation.

Plagiarism-checking systems can be used for learners' educative use and also by teachers (e.g. Turnitin). The European Commission's new SELFIE [Self-reflection on Effective Learning by Fostering Innovation through Educational Technology] tool offers a detailed description of what it takes for educational organisations to be digitally competent. *Piano Nazionale Scuola Digitale*, the Italian Strategy for Digital Schools, according to a recent study (OECD, 2015), attempts to mainstream "new models of school organisation, new products and tools to support quality teaching… (and) inventing new pedagogic and organisational practices". Ireland's current Digital Strategy for Schools (DoES, 2015) is involved in "modernising the curriculum, to embed digital learning" again implying that 'what is now' is the appropriate starting-point and, albeit visionary, still regards digitisations as helpful support as opposed to fundamental transformation.

There is, as a recent study (Crouch and Montoya, 2016) sets out, a "global multiplicity of strong initiatives in generating better data on learning outcomes" including the Global Alliance to Monitor Learning (GAML), the World Bank's SABER system, the Assessment for Learning (A4L) initiative, the learning assessment recommendations of the Commission on Financing of Global Education, and "interesting discussion documents from the background work done by the Centre for Global Development for that Commission". For a politico-educational establishment obsessed with measuring, comparing, selecting and sorting learners out generally, contemporary technology offers "a range of opportunities for developing tests that are more interactive, authentic and engaging" (Stacey and William, 2013). For all the talk of inclusion and equity, education as presently practiced

is, as already noted, mainly about sorting students out. [Perhaps something with a high Artificial Intelligence quotient (AIQ) will soon explain the limitations of the testing philosophy to fallible human planners.]

THE EVOLVING CURRICULUM

Attention is also afforded to the potential of Digitisation in particular subject areas. Online study aids and intranet resources herald great changes for the future of English (or, indeed, French, Spanish, Chinese, Irish, Bangla or other Mother Tongue) teaching, building a visual dimension to the curriculum. Learners may be able to learn other Languages through all available sensory channels, allowing learners to see printouts of their own voices and tune their intonation to match that of native speakers. Interactive maps and dedicated websites are opening up Geography for all age groups; History students will be able to participate in battles, court scenes and the lives of common peoples, free from danger or destitution. Beyond the particular, a creative comprehensive curriculum for surviving and thriving in the Digital Age may be developed, with the inclusion of programming and familiarity with a computer language [along with Mother and a foreign tongue] for all. Extra-mural pursuits, for example oratory and debating (Quintilian, circa 60 AD; Douse, 2017), may flourish. With the global school, the opportunities are there in all disciplines and for all learning stages from early childhood to postgraduate, integration in diversity being the watchword. The sharing of worldwide experiences along with the re-shaping of them for specific local conditions and aspirations will be a basic process for optimising learning in the Digital Age.

One far-sighted contribution "reinvents K-12 education for an exponential world", moving away from **"…Irrelevance, Unimagination, Colouring Inside the Lines and** Emotionless boredom" towards "Storytelling/Communications, the exploration of passions, Curiosity & Experimentation, Persistence/Grit, Technology Exposure, Empathy, Ethics/ Moral Dilemmas, The 3R Basics (Reading, wRiting & aRithmetic), Creative Expression & Improvisation, Coding, Entrepreneurship & Sales, and Language (Diamandis, 2016). Running through all of this is the belief that education can and should be enjoyable (that might be termed "fun" in popular language – see also Douse, 2005 and 2013). Digitisation will, if handled creatively, enable that enjoyment to be experienced, by both teacher and learner, across the curriculum, across the globe. For every planning-hour given to the allocation of resources, at least a dozen planner-hours should be devoted to guaranteeing enjoyment (and an equal number to ensuring equitable educational outcomes).

Whether there should continue to be a discrete secondary school subject area labelled, for instance, 'Computer Science' is questionable. Given that all curricula will be set "in the context of digitisation", and that all subjects will be taught, experienced and, as necessary, tested utilising digital technologies, whether that which would be left over is sufficient for a dedicated 'Computer Science' curriculum is dubious. Pre-primary children should learn coding, perhaps as part of 'languages' lessons, assuredly as fun; primary pupils will be programming away and will understand, from many kinds of lessons and extra-curricular activities, how computers work – for them. Some tertiary and all vocational students will prepare for careers and occupations (many, as yet unknown), but in this paper we are talking about 'education'. It may be pedantic to insist that the production of, say, computer engineers or specialists in fuzzy logic is 'training' but let it be acknowledged that 'pedant' and 'pedagogue' derive from the same deep root. As emphasised earlier, a hard border between 'education' and 'training', the latter being dedicated to explicit preparation for (particular

areas within) the world of work, the former devoted to life-enhancing, life-long, life-wide, social-ly-constructed self-realisation, enables both activities to occur without confusion as to their objectives (Douse, 2013).

The well-remembered aphorism "learning facts from memory or solving problems alone in an educational institution are terrible ways of learning… in no country is such a curriculum fit for purpose" (World Bank, 2016) is undeniable in the evolving condition of collaboration, group work and digital resources. The global school resembles in many respects a neural network, whose inter-cellular connections and integration offer synaptic synergies making the whole significantly more effective, more evolved, more alive, than the sum of its parts, essentially a genuine synergy. Learners may participate in materials development for (or with) one another in distant countries, learning from one another and from globally distributed teachers. Their greater mobility will require globally accepted standards of qualifications and ones that can be recognised cross-border, as well as agreed systems of credit transfer, work-based learning accreditation and prior learning assessment and recognition (Contact North, 2016). More and more, educational planning becomes an international, as well as a national, pursuit – and, as already emphasised, one of educational aspiration as opposed to economic allocation.

THE COMPLEAT TEACHER

Digital Age teachers will, in their training, approaches and job descriptions, differ significantly from their pre-digital predecessors. But – and sighs of relief may now be heard echoing across staffrooms worldwide – such differences are less technological and much more philosophical. In many walks of living, the technology is coming back to within the user's grasp and, increasingly, a readily-achieved and confident familiarity with simple devices and straightforward systems will enables teachers to focus on creative approaches, individual support and class management. As already emphasised, the expenditure focus in the context of digitisation should not be on extensive and expensive investment in desktop computers and suchlike but, rather, on the connectivity of schools, teachers and learners using a BYOD approach. Much as 'every teacher is an English teacher' applied previously (especially in English-speaking countries) it is now the case that 'every teacher is a digital skills teacher' (which, as implied in the previous section, raises the issue of how soon 'specialist ICT teachers' may be phased out). With digitisation, the paramount investment heading is not the technology so much as creating, supporting and remunerating competent, confident and cheerful teachers, deserving and receiving widespread respect, playing key facilitative roles in 'education founded upon Digitisation' and being effective agents at ease in the propagation of digital understanding (however that may be defined).

The teachers' task continues to be that of bringing out their learners' potential which no more necessitates a technical facility with the equipment's construction than did a 20th century teacher need to be familiar with blackboard production or the chemistry of chalk (or a 19th century one with the manufacture of birchwood canes). Education will continue to be characterised by person-person relations: the machine is the medium through which such links may be extended and the catalyst by means of which they may be deepened. Indeed, virtual interaction is becoming a major and creative element in revised learning methodologies and appropriate pedagogies, characterised by internet-supported teaching and studying, active learning in learner-friendly classrooms, distance education and 'mobile learning'; open educational resources; and the preservation of data privacy. Once incorporated within Digital Age consciousness, and its title corrected, UNESCO's 'ICT Com-

petency Framework' may still play a pivotal role in informing aspects of the design of all future teacher professional learning opportunities (UNESCO, 2008). While the preparation and lifelong upgrading of teachers will encompass training in digital understanding and information fluency, through workplace learning as well as in dedicated teacher educational institutions, it is emphasised that this is broad-spectrum continuous professional development, a universe and an age away from specific 'ICT training'.

As an OECD (2015) report puts it, "the successful integration of technology in education is not so much a matter of choosing the right device, the right amount of time to spend with it, the best software or the right digital textbook. The key elements for success are the teachers, school leaders and other decision makers who have the vision, and the ability, to make the connection between students, computers and learning". Teachers in the global school will be well-prepared and research-capable (academically and digitally) and well-led professional educators, at ease in delivering, facilitating and assessing digitally-supported learning, and guiding, supporting and counselling the learners, sharing their teaching materials globally and participating in professional development projects. Given the essential nature of their creative participation in these coming years of major transition, the recognition and full involvement of teachers' professional organisations and representative federations is vital. Given also that teaching will need to embody a constructivist pedagogical orientation, actively including learners in determining meaning and knowledge for themselves, the genuine participation of learners, of all categories and ages, is equally imperative. The successful educational planner will be the one who enables everyone to participate in the planning process: yet again, digitisation makes that possible.

CONCLUSION: INTO DIGITAL AGE EDUCATIONAL PLANNING

The supreme task of educational planners, once the transformative consequences and potential of digitisation are understood, is to facilitate the utter reshaping of learning and teaching for our times, and for times to come, locally, nationally and worldwide. Their task may no longer be limited to securing implementation but it necessarily extends to facilitating continuous experimentation and perpetual innovation. Certainly, the international dimension and the informal learning dimension are paramount. Digitisation, symbolised by the global school, signals a sharing of learning experiences and a coming together of classroom cultures. Moreover, this movement towards the one universal educational institution (the global school) will, thankfully, make national league tables obsolete and the Programme for International Student Assessment (PISA) redundant. Schooling will resume its true role of drawing out: less a process of work-preparation and student-comparison, more one of creative stimulation and enjoyable interaction, distributed across the globe.

And, in a similar leap forward, educational planning may now focus less upon investment decisions and more in terms of identifying desired outcomes and consequences (which is why 'COSTS' is relegated to an Annex in figure 3, above). Essentially, it ceases to be an exercise mainly in the allocation of scarce resources (by desiccated economists) in favour of plotting imaginative paths towards the achievement of lofty aspirations: turning the 'visions' promulgated in plans into popular realities in a digital world (by enthusiastic educationalists). Whether it be of and for a street school or an open university or a low-income country (or all nations generally), the common planning task remains as ever was, save that powerful weapons of mass instruction and universal inspiration are now available to enable education to come to pass more effectively and entirely equitably and completely convivially. As with teachers, digitisation will enable those who plan education to

learn by doing in an ever-changing environment, much as the pre-school child or the post-doctoral student is enabled to enjoy grappling in stimulating situations where even that what is being learned and done is changing. As with teachers, with digitisation educational planners may come into their own.

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