

# Open Education 2030

Contribution to the JRC-IPTS  
Call for

## Vision Papers

### Part II: School Education

Work in progress: 15 May 2013

## TABLE OF CONTENTS

<b>PART 1: Winners of the Best Paper Award</b>	<b>4</b>
The Open Mind <i>Alex Beard and Jacob Kestner</i> .....	5
Personalised Learning Together <i>Jim Devine</i> .....	11
How will the digital textbook of 2030 solve Meno’s paradox? <i>Tore Hoel and Jan M. Pawlowski</i> .....	18
Open Education for Schools: Progress Review 2030 <i>Paul Kelley</i> .....	23
School education in 2030 and beyond – Empowerment through personal learning navigation <i>W. J. Pelgrum</i> .....	27
Open Schools 2030 <i>Pierre-Antoine Ullmo</i> .....	32
European education 2030 – open and free, integrative and sustainable – a vision <i>Kaja Wesner</i> .....	37
<b>PART 2: Other Papers submitted under the Call</b>	<b>41</b>
Opening schools by mobile learning <i>Daniel Bernsen</i> .....	43
My Vision for School Education: As "Education for the Future" of Man and the World <i>Ewa Danuta Bialek</i> .....	46
Improving the use of our most powerful resources – towards a culture of self-regulated learning <i>Giuliana Dettori</i> .....	51
If it is so good.... why not? <i>Fernando Escribano Martín</i> .....	53
Improving future for next generations <i>Virgínia Esteves</i> .....	57
School as a centre of socialization – a challenge for education policy and law <i>Jüri Ginter and Mariann Kajak</i> .....	58
All-Embracing Digitalization or 10 Things to be Done in School Education till 2030 <i>Aleksandrs Gorbunovs</i> .....	64
Worldwide education/Cooperative education <i>José Ramón Jiménez Gil</i> .....	68

Children contribute to their school and learn by making <i>Gisèle Legionnet-Klees</i> .....	70
ICT in Foreign Language Teaching <i>Emanuela Leto</i> .....	74
Openness and Compulsory Rural Education 2030 <i>Ronald Macintyre</i> .....	76
Girls are going to save the world! <i>Cheryl D. Miller</i> .....	79
A new model of learning based on new methodologies supported by new technologies <i>Antonio Monje Fernández and Miguel Ángel Pereira Baz</i> .....	81
Real Impact for Better Learning: The road to Education in 2030 <i>Kirsten Panton</i> .....	83
Open Apps for opening up school education <i>Giles Pepler</i> .....	89
Visionary Learning in 2030: Secondary Education <i>Gina Souto</i> .....	92
Critical influencers on education - how will these shape the schooling systems of 2030? <i>James Stewart</i> .....	97
Open School Learning – a vision to improve European schools towards 2030 – using the results of the Open Discovery Space project <i>Christian M. Stracke, Nicolas Athanasiades, Ard Lazonder, Antonis Ramfos, Sofoklis A. Sotiriou, Lampros Stergioulas (on behalf of the whole ODS consortium)</i>	99
Online Curriculum Courses in Secondary Schools <i>Andreea D. Suci</i> .....	105
OER as basic and renewable public and commercial knowledge resources in 2030 <i>Alek Tarkowski and Kamil Śliwowski</i> .....	107
The Open Community in the School of Today <i>Asimina Theofilatou</i> .....	110
Teachers, University Students and an Open Education Platform <i>Katerina Vigkou</i> .....	116
Enabling the use of OER in schools in 2030 <i>Martin Wolpers, Maren Scheffel, Katja Niemann, Uwe Kirschenmann</i> .....	118
Founding a New Alexandria <i>Paolo Zanieri and Patrizia Del Lungo</i> .....	122

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## Part 1: The Winners

Thanks to all authors for their inspiring thoughts on how Open School Education may look like in 2030. We received 30 papers in total, all of them imaginative and full of interesting ideas. We found it very difficult to select the best papers among the many excellent contributions. Thus, we had to be extremely selective and decided, in the end, to strictly narrow our long list of outstanding papers down to those who focused clearly on the **FUTURE** aspect of **SCHOOL** Education and critically assessed what **OPEN** Education can mean in this context and how it can be achieved. Among the many excellent papers, we believe that there are seven which fulfil these additional strict criteria.

In this part, we present, in alphabetical order, these papers that were selected for the best paper award. The authors have subsequently been invited to participate in the second of a series of three foresight workshops on Open Education 2030, taking place in Seville on 28-29 May, 2013.

[\*Alex Beard and Jacob Kestner\*](#) think that students and teachers will continue to go to the school down the road; and they'll begin to go to the school in the cloud.

[\*Jim Devine\*](#) argues that current ideas about classes, subjects, timetables and age cohorts give way to workable models of personalised, active, experiential, challenge-based learning together.

[\*Tore Hoel and Jan M. Pawlowski\*](#) think that there is no doubt that future digital learning resource will engage the learner in a Socratic dialogue; the challenge is to come up with the roadmap how to get there.

[\*Paul Kelley\*](#) presents his vision statement in the form of a blog written in 2030 on the progress in Open Education since 2013, arguing that Europe is in the process of rethinking education, a grand challenge needing inputs from many disciplines including neuroscience and new technologies. Open Education can be Europe's Knowledge and Innovation Enterprise in that process.

According to [\*W.J. Pelgrum\*](#) learning in schools will in 2030 be a continuation of the intrinsically motivated learning processes that characterize early childhood development, which will be facilitated through Personal Data Spaces from which all information needed for learning navigation, monitoring and certification will be derived, all based on invisible technologies.

[\*Pierre-Antoine Ullmo\*](#) envisages major changes to take place by 2030 if school education is based on the active participation of the students themselves; the enthusiasm and engagement of digital natives constitute the new milestone for our educative systems.

[\*Kaja Wesner\*](#) envisages European education 2030 as “open and free, integrative and sustainable” – based on a Common European Education Policy (CEEP) and the core elements of the European platform for open and free education media and materials, the European School Cloud and standardised digital standards and formats.



## **The Open Mind**

Alex Beard and Jacob Kestner

*Students and teachers will continue to go to the school down the road; and they'll begin to go to the school in the cloud.*

### **Abstract**

Modern networked technologies and open information sources mirror the workings of the human mind. As we individually remake our memories and ourselves, so does society continually remake our collective mind. Human knowledge is no longer encyclopaedic, but wikipedic – flowing and networked, not fixed and static. It begins to resemble Hegel's Absolute Mind: collective, self-knowing, free from the limitations of human institutions. Despite this, modern education paradigms belong to the era of the empire and the encyclopaedia. Schools are organized bureaucratically in the image of artisanal workshops or factories; teachers are agents of a central knowledge and authority. These forms are implemented with varying levels of success. They are also obsolete.

By 2030 new paradigms of education will reflect our understanding of knowledge as in flux throughout a collective mind. Familiar technologies that facilitate social-networking and user-generation of content will support the education of all. Learners will engage independently with a single self-organizing learning environment – the Open Mind – through web-enabled devices. They will still attend schools, but radically altered and inside out. Here they will engage in collaborative learning projects, receive guidance and socialize. Crucially, we will not lose the essential teacher-student or student-student learning relationship.

Teachers will be problem-setters, bricoleurs, consultant physicians, and analysts. They'll work with the Mind to sculpt assessments and diagnose student learning needs, mediating learner experiences through the creation, discovery or adaptation of content. The cloud will grow, facilitating the access of any learner, anywhere to all of the highest rated content. Access to the best learning will no longer depend on socioeconomic factors.

In creative symbiosis with the Open Mind will be an eco-system of pedagogical research. The cloud interactions of both students and teachers will generate a growing data set, allowing analyses of approaches at previously unimagined scales. This evidence-base will drive constant evolutions in the role and effectiveness of the learner, teacher, school and Mind.

## School Education 2030

*“When it was announced that the Library contained all books, the first reaction was unbounded joy.”*

Jorge Luis Borges, *Ficciones*

### **Current forms of schooling are artisanal and obsolete**

In *Race Against the Machine* (Digital Frontier Press, 2011) Erik Brynjolfsson and Andrew McAfee describe the idea of General Purpose Technologies that interrupt and accelerate the normal march of economic progress and have inherent potential for technical improvement, getting better over time. Computers, especially when combined with networks and called ICT, are GPTs. Though this technology exists, it has not yet been intelligently applied to school education.

Clay Shirky uses the example of the string quartet to illustrate the shortcomings of the current education model. In [‘Napster, Udacity and the Academy’](#) he writes that ‘Performing a 15-minute quartet took a cumulative hour of musician time in 1850, and takes that same hour today.’ He calls this problem ‘cost disease’, and in school education it sees a teacher in a room with thirty-or-so students, lessons organized in equal sized blocks of time throughout the day, ‘an artisanal product, created from scratch, on site, real time.’ But like music, the model of education can be transformed: ‘the biggest change... has come not from production but playback... the vast majority of music listened to on any given day is no longer recreated live.’ He could add – and it is no longer individually owned.

### **By 2030 a new understanding of school education will exist.**

A time of new technologies is a time of new idealisms. Education needs new utopias. The early socialists of the nineteenth century envisaged new societies based on the technological advances of their day. Their utopias – built around concepts of mechanization, efficiency and leisure – were deeply concerned with mass education and still heavily inform our current school models (as Ken Robinson argues). Our thinking about schools in the twenty first century should channel their imaginative power. But rather than imagine units organized around production, as in Fourier’s *Theory of the Four Movements* or Owens’ *New View of Society*, we need forms based on the open exchange of learning for all.

### **At the centre will be the Open Mind.**

We can sense in the cloud technology that enables users to hear, share, individualize and adapt music content an echo of a future era of learning: the Open Mind. A network of open content, software, resources and data accessible to all, it will be – like human mind – in continual evolution. Where the learner of today builds skills, acquires information and memorizes static curricula created by schools, districts or national government, the learner of 2030 will lead their own interactions with this self-organizing learning cloud.

Pockets of progress point already to this future. Project Gutenberg, Open Shakespeare (an interactive and open content site of criticism and scholarship) and Textus (enabling users to annotate and share comments on digitized public domain texts) are changing academic learning, pioneering new forms of curriculum and breaking down the borders of knowledge. Sugata Mitra goes further, calling knowledge obsolete. Static knowledge is. In the Open Mind knowledge will be dynamic and – in the understanding of Finnish pedagogical practice

– only understood as knowledge if it can be communicated. In the Open Mind, knowledge is learning.

### **Learners will engage directly with the self-organizing Open Mind**

Every learner will have unrestricted access to the Open Mind, either through a personal device or one issued by a school. Through his ‘Hole in the Wall’ projects, Sugata Mitra showed the causal relationship between access and learning (and rapid growth in that learning where the access was loosely guided by mechanisms in the learning environment, and facilitated by a guide). He labels the world beyond the interface the Self Organizing Learning Environment (SOLE), and envisages the eventual networking of these environments into a single ‘school in a cloud’ connecting all learners to experiences, peers and teachers.

The Open Mind of 2030 will be a SOLE that learns and adapts itself to the needs of its user learners. Gaming software is showing how this might happen. Zynga gathers information on a player’s behaviour in a game and uses that data to moderate the experience in real time and to tailor future experiences to the player’s preferences. Some educational software can already sense when students “are having difficulties and need more detail, repetition, and perhaps a slower pace” (Brynjolfsson and McAfee), while programs like Udacity, Coursera and edX all track the web interactions of students to evaluate the pedagogical success of the content, providing data and feedback to students and their professors. By 2030 the Open Mind will offer educational content perfectly differentiated to a student’s learning ability and adapting to them as they progress.

### **Though small schools will remain the primary interface of education**

Higher education is already seeing the application of new models of enrolment. Classic elite universities guarantee high graduation rates, but are expensive and inaccessible to the majority of students. MOOCs are beginning to allow cheap online access to a high standard of education for lots of people, but only a small percentage of them are completing courses. Hybrid models, involving lightweight additional support alongside a MOOC, can result in better graduation rates, so open-minded universities are beginning to offer these. The schools of the future will follow this model. Whilst learners will have access to the school in a cloud that is the Open Mind, students will still gather in schools. Society must still be accountable for the education of all of its children.

The best way to achieve this will be through small schools built around socializing and group work. Human relationships are central to a child’s development, and schools will encourage these. To better meet student needs, the day won’t be divided into equal sized lessons which students attend with 30 other students, but will more closely match the best forms of delivery. So students might watch lectures individually or in whole school groups. They might use individual time to practice – in which case they may need no more than a supervisor. With automated differentiation, teacher time would be freed up. School leaders won’t organize teams of subject generalists, but will find new ways to differentiate and specialize their teaching capacity.

### **The role of the teacher will be radically altered**

Teachers will not be eliminated. They’ll continue to create, facilitate and manage learning interactions, but hybrid models will enable each teacher action to be more creative, more productive and more accessible (both for kids in that school, and those beyond). In 1997 humanity’s best chess player, Gary Kasparov, lost to Deep Blue, the computer developed by a team from IBM. But a new form of competition pits any combination of human and

computer teams against one another – the 2005 competition was won by two amateur chess players using three computers. They beat grandmaster opponents and participants with much greater computational power. As Brynjolfsson and McAfee explain, ‘weak human + machine + better process was superior to a strong computer alone and... to a strong human + machine + inferior process.’

Principles of hybridity and process management will be central to the teacher’s role in 2030: not technology or teachers, but teachers made more effective by technology. Some of these principles are applied in schools already. The ‘flipped classroom’ (or ‘time-shifted teaching’) buys back hours of lesson time over the course of a week by shifting teaching outside of class time through lectures made available through Youtube or DropBox and questions posed on Twitter. Within the school they will be disruptors, setting open-ended tasks, assigning project briefs and giving guidance. They’ll coach students one-one, or facilitate small group learning and collaboration.

Teachers may develop specialist responsibilities for aspects of practice. They might lead on assessment, design of group pedagogy, or the creation of lecture content. Increasingly, they will cease to be generalists. A senior consultant teacher might wander the corridor providing guidance to junior teachers, carrying out video observation, working with high need groups of students. The culture would be one of continual improvement.

### **Teachers will create, find and find-and-adapt content**

The availability of (and ability to adapt) content – whether photos to use as historical sources or quizzes created by other teachers – is one of the most obvious benefits of the internet. Jake’s mother, a teacher, used to cut up magazines to create worksheets. She’d use them once, and perhaps share them with the handful of teachers in her school. Today teachers can create, assess and administer a homework quiz using a free tool like SurveyMonkey, uploading it to an open platform so that it can be used and adapted by other teachers. OER and the TES Resource site are already attempting to aggregate this kind of tool.

By 2030 adaptations, mash-ups and *bricolages* will be the norm. Content in the Open Mind will constantly evolve as teachers (and students) use, add-to or adapt it for new learning needs, inviting peer-review and providing evidence of learning results. Picture Sal Khan’s Academy, constantly updated and adapted with the best lectures, lessons and learning activities by educators around the world, or Michael Sandel’s lectures, mashed up and annotated by a succession of students and teachers. Teachers will save time cutting up magazines, and spend it doing more of what they uniquely placed to do.

### **Data will be collected, shared and analysed to the benefit of all**

Increasing amounts of useful data about all students, teachers and teaching resources will be generated for individuals, schools or the system. When a teacher gives a SurveyMonkey test, the results will be recorded. As these results are recorded over time an open data-set will emerge permitting an analysis of trends. Open source data visualization software will be used to provide high quality information to the student, teacher and parent about progress in the student’s learning. The Big Data that is produced will allow educators to extract new insights or create new forms of value.

In health, the benefits of this are already being seen. Brynjolfsson and McAfee (2011) explain how the ‘the Main Star Washington hospital Centre in Washington DC working with Microsoft research analysed several years of its anonymised medical records...for ways to reduce readmission rates and infections... the system also spotted another unexpected top predictor [of patient readmission]: the patient’s mental state.’ It’s not difficult to imagine a



similar early warning system might have application in education, to monitor those at risk of dropping out of school. In fact just such a project is being developed by WCET, funded by a \$1m Gates Foundation grant.

### **A research eco-system will drive new learning practice**

This potential for research in education is long overdue. Alex's mother is a teacher. She is currently excited about Howard Gardener's theory of Multiple Intelligences (1983), first published thirty years ago, and only now reaching her classroom. Research findings travel slowly in the world of education. There are also very few of them. In the UK, scientist Ben Goldacre has published a paper for the Department of Education making the case for the use of randomized control trials to drive up the quality of student learning in the way that they have been used to improve health outcomes in hospitals. The open data and evolving content generated by students and teachers would be at the heart of the 'eco-system of research' that he holds to be necessary to generate meaningful insights about best practice. Through data-sharing, we'll build research networks where teachers submit research questions and academics manage randomized trials of particular activities or pedagogical approaches. Trends analyses will facilitate data-driven decision-making at the school or system level. Research results will be disseminated, accessed and acted upon by teachers throughout the network.

### **The system will facilitate a virtuous cycle of teacher development**

Research has shown that teachers don't get much better over time. Some people feel that this is because teaching is about innate talent. We believe it's due to the fact that they're not getting enough training. The training they are getting is not of the right kind. Open Education can support teacher development so that teachers do get better with time. Teaching is a performance profession. The best way to get better at it is to do it (and receive feedback) or to watch others doing it (and provide feedback). Ideally, teachers would receive feedback in every lesson – just like their students. But this is impractical – it requires two teachers to be present, and teacher time is of premium value. But as we saw with the string quartet, playback technology will let us change the model.

In 2030, teachers will record all of the activity that takes place in their classrooms (along with the record of the content that they have created and adapted – and the ensuing learner interactions). At the end of each day they'll select and upload onto an open resource platform small segments of that day's teaching that were particular successes or challenges, tagging them with key words. With a formal coach in the school, or an informal peer in the cloud, the teacher will then debrief the teaching episode, and perhaps watch videos of others successfully executing similar tasks, providing feedback in comment form or via Skype.

Over time, this open teacher development forum will grow (in symbiosis with the content of the Open Mind and the eco-system of research – one can envisage the integrated whole). Teaching segments could be rated by other professionals or ranked according to views. A taxonomy or sense of the collective understanding of best practice will slowly emerge and evolve over time through the process of upload, tag, watch, feedback, rate. Teachers, not inspectors, will own the profession. Students will engage as learners with the best content to make the teacher's reach truly global. They will offer feedback to increase quality. The School in the Cloud will grow and grow.

### **Learning will be local, global and open.**

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## **Personalised Learning Together**

Jim Devine

*Current ideas about classes, subjects, timetables and age cohorts give way to workable models of personalised, active, experiential, challenge-based learning together.*

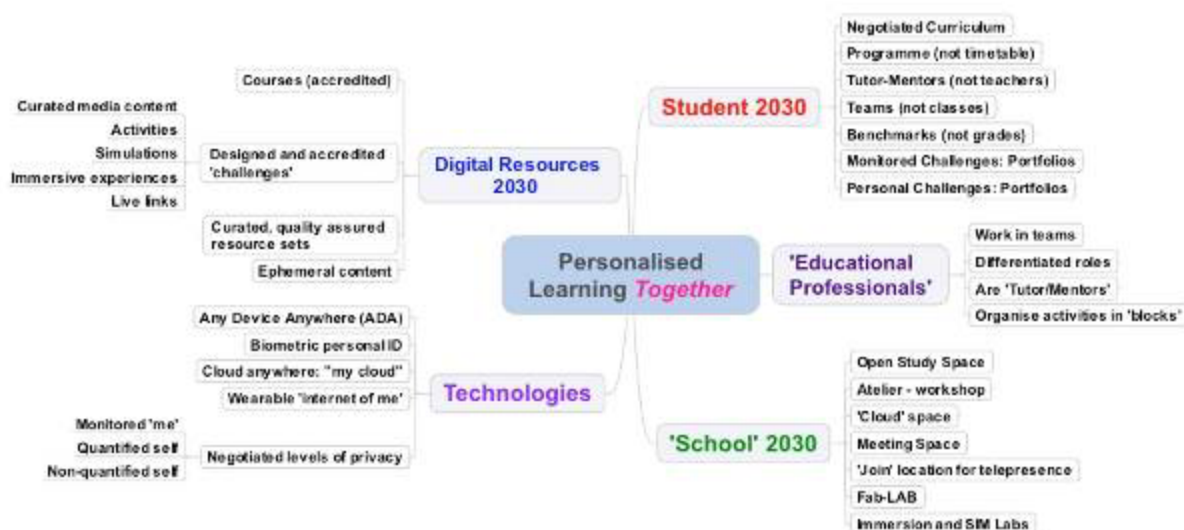
### **Context 2030**

Parents and society generally will cherish children’s development from early childhood to adulthood no less in 2030 than we do today. We will sustain a school culture, because we have deepened our understanding of the value sites of physical ‘togetherness’ in an otherwise hyper-connected world, where much of what we do as individuals or groups is neither time-bound nor place-bound. School, but not as we know it, will remain very much a part of growing up. Educational Specialists (ESs, as we will then call them, not teachers) will be highly valued in society, but as a profession will be more diversified in their roles and practices. The sea change that will occur is that they will work in multi-disciplinary teams, supported by paraprofessionals. The paradigm for education will be ‘challenge based’. Many school buildings will need to be adapted and refitted in order to make them fit for purpose as we transition to new practices.

We also need reassurance about how our children are progressing, and they do too, but by 2030 we will have long given up on the idea that this can be adequately measured by the examinations and other assessments we depend on today. Individualisation will be a reality in all facets of life, and for our children this will mean a customised, personalised curriculum with an emphasis on engagement through active, experiential learning, that combines solo and team oriented activities. Progression from school to further studies (vocational or academic, or a mix) will still be greatly valued, but the pathways will be highly diversified and, for a majority, will involve integrating work and formal studies, something that will be completely natural to them.

What will remain constant, however, since it is deeply embedded in the human psyche, is the notion that ‘what gets measured, gets done’ and we will have developed powerful and far-reaching observational and analytic capabilities to help in forming objective judgements about any individual’s performance, based in large part on the digital audit trail of their activities. Concerns about such far-reaching analytics will have been largely allayed by 2020, by which time we will have developed a highly sophisticated taxonomy of privacy, and we will have the technologies to implement it in the best interests of the individual.

So what will our young students be doing in 2030? When and how will we allocate credits for it? How will ‘school’ be organised? How will the evolution of technologies, digital media and resources act as catalysts for the transformation of school education? Transformation will occur, and indeed will become inevitable, as a consequence of a convergence of factors summarised in the following illustration. In short, the future paradigm is for learning that is highly personalised, but also highly socialised during the critical developmental years to the age of eighteen – Personalised Learning Together.



## Technologies

Already significant developments in semantic web, ambient intelligence, ‘internet of things’ and big data will be fully mature and ubiquitously deployed by the 2020s. Immersed at all times in a cloud environment, our ‘presence’ and even our intentions will be signalled by an inconspicuous wearable, biometrically enabled device. Many of our interactions will be entirely automated, e.g., arrival at work (or school) will be recorded as we pass through the door. Payment for lunch in the cafeteria will no longer involve production of cash or of a payment card. In effect, our wearable device becomes an ‘internet of me’ and, for students, this becomes their constant point of presence in an educational cloud that is place and time independent. In school, a wide range of devices are immersed in the cloud environment: screens (small and large), wearable AR and immersive devices (glasses and headsets), laboratory equipment, workshop equipment and sports/gaming consoles. Costs of manufacture for many of these devices are so low that they are completely ubiquitous. Students do not bother to bring their own devices; by 2030, it will be a case of any-device-anywhere (ADA): pick it up and it recognises the individual and configures to their profile by synchronising with their wearable ‘internet of me’.

By 2030, our understanding of privacy and protection of the individual will have significantly advanced. We will recognise and be able to implement three core levels for each individual:

- “Monitored me”: where we understand that our interactions and activities are being logged and can be subjected to analytics. During much of what students will do in fulfilling requirements of formal education, they will operate in this mode.
- “Quantified Self”: all manner of technologies and biometrics will assist and enhance our individual lives, health and wellbeing. However, data generated will be private to the individual, unless they choose to share it.
- “Un-quantified Self”: we will have a sophisticated understanding of “time off”. This will include being entirely offline and unmonitored, but it will also include a particular form of digital engagement that is ‘freestyle’, i.e., leaves no trace.

## Evolution of Digital Resources

A rich, dynamic catalogue of high quality, well-designed and educationally validated resources will exist, spanning all disciplines and levels, aligning with national and increasingly international curricula and comprising:

- Full courses: (appropriate to different stages). Each course will include a curated set of content (including options for live interventions in a majority of cases), suggested activities, challenges, assignments and projects, all underpinned by analytics that will provide formative and summative assessment. Courses will be designed and developed by multi-disciplinary teams, comprising curriculum specialists, educational professionals (‘teachers’), visual and media designers, games/activity designers and analytics specialists. Courses of this kind will be validated by national and pan-national educational agencies. Schools may choose from a very extensive catalogue of courses or can put forward courses of their own design for validation.
- Curated Resource Sets: Ongoing collaboration between educational professionals and other stakeholders, e.g., higher education, industry, cultural institutions, health, environmental and other agencies of government, will lead to the creation of curated resource sets, that will go far beyond what is available today as individual resources or apps. These curated sets will be maintained and regularly updated within an educational quality assurance framework, and they will be identified with recommendations for their use in specific contexts.
- Designed and Accredited Challenges: Challenge-based education will become a reality during the 2020’s and will be fully embedded by 2030. We can think of challenge-based learning as an evolution of problem based learning. To work at scale, schools will need to have in-house, or through collaboration, the multi-disciplinary skills required to design meaningful, relevant, comprehensive challenges for students, appropriate to their stage of development. Alternatively, schools may tap into a catalogue of ‘challenges’, i.e., fully designed kits/scenarios, much as business faculties in colleges today tap into libraries of real world business cases. Again, as is the case for ‘courses’, challenges will be validated and accredited by national or pan-national agencies. ‘Challenges’, will represent the new units of curriculum and will be undertaken in groups, supported by tutor/mentors. A typical ‘challenge’ may be of several weeks duration. Students collaborating on challenges will maintain individual portfolios as evidence of activity and participation.
- Ephemeral Resources: An incalculable quantity of freely available digital resources of all kinds will be accessible to the learner of 2030. Individual learners will of course continue to create and share resources and will join communities of interest and practice, much as they do today. However, we will increasingly come to regard such resources as ephemera. Much of what passes today for OER/learning objects would be regarded by 2030 standards as ephemera – interesting curiosities, but largely undeveloped in terms of educational potential.

### **Flexibility and Personalisation**

The co-evolution of digital technologies, devices, infrastructure and resources that will occur in the coming decade suggests that a changed trajectory for formal education is inevitable. Looked at another way, it raises questions about how we can justify continuing on our current trajectory, where much of the evidence to date points towards a ‘business as usual’ model of schooling, supported rather than invigorated or reinvented by digital advances. Consider the following questions in the light of the digital prospect for 2030:

- Why would we organise schools around classes?
- Why would organise groups on the basis of narrow age cohorts?

- Why would we organise curriculum around the narrow confines of ‘subjects’?
- Why would we organise the day into discrete time-slices?
- Why would student choice be as limited as it is today?
- Why would assessments and examinations be scheduled for every student in the same end of term or end of year timeframe?
- Why would we expect teachers to be a professionally homogenous group, operating to common standards but in the mode (as seen by their students) of sole-practitioners?
- Why would we expect one school to be much the same as another?

Arguably, by 2030 there will be no valid reason to hold to familiar time-honoured and deeply engrained practices, and indeed they will have been largely abandoned. However, there is no doubt that the adjustment to a new trajectory for school education will be difficult and divisive, since step changes are required rather than less radical adaptation.

### **The Future?**

What will the future look like on this new trajectory? It will be founded on five fundamental assumptions:

1. Each student will have an individually negotiated curriculum. (Parents, educational guidance specialists and the student will be involved in selecting this curriculum, with the locus shifting increasingly to the student as they develop in age and maturity).
2. The curriculum will be balanced (notionally 30:50:20, below) in order to ensure that each individual:
  - 2.1. Achieves and demonstrates a core set of competences – we will call these ‘benchmarks’. There will be a pan-national consensus about a framework for a wide range of benchmarks, relevant in scope and breadth to particular stages of development. Students of 2030 will refer to this aspect of their curriculum as ‘Benchmark Challenges (BMCs)’. Self-directed learning, under the guidance of a personal tutor/mentor, using digital ‘course’ resources, will be the predominant modus operandi.
  - 2.2. Engages in and satisfactorily completes a wide range of ‘challenges’ (as described above) as a member of a group under the tutorial guidance of educational professionals. An individual portfolio will be used to document ‘challenges’ for both formative and summative assessment. Students will refer to these as ‘Guided Portfolio Challenges’ (GPCs).
  - 2.3. Has freedom to identify personal goals and personal ‘challenges’ and can follow such interests, either formally or informally. A student can opt to offer a personal ‘challenge’ as an element of their formally assessed curriculum and in this case they will fulfil a portfolio requirement similar to that of 2.2. Students will refer to these as ‘Personal Portfolio Challenges’ (PPCs).
3. Benchmarking (BM) tests (i.e., relating to 2.1 above) can be taken at anytime, since they are fully online. Like a driving test, each BM is seen as a necessary indicator, but the individual prepares and takes the test by reference to his/her own circumstances and state of preparedness.

4. ‘Challenges’, either school-based or personal, will be pursued as project ‘blocks’, i.e., the student is substantially or fully immersed in a challenge, rather than pursuing several in parallel.
5. ‘Educational professionals’ will take a team-based approach to tutoring and mentoring of students. The education profession will be more diversified and will include paraprofessional and other supporting roles.

When students are preparing to advance to tertiary education or to enter the workplace, what will be looked for is a statement of their achievement, covering BMCs, GPCs and PPCs. Schools will be differentiated by the scope and quality of the GPC ‘challenges’ they can support – this will be related to the inter-disciplinary mix of professional and tutorial skills they have in-house or that they can bring to bear through their wider network and/or through their engagement with external organisations. Individuals will be distinguished by the ‘challenges’ undertaken and, particularly, by their personal challenges (PPCs).

### **School 2030 – how will it be organised?**

To support flexibility and individualised curricula, by 2030 the educational profession will be significantly diversified and the all-important ‘group/together’ aspects of personalised learning will be supported in school buildings that have undergone significant spatial re-design.

#### *Educational Professionals:*

Careers as educational professionals will include such roles as:

- Discipline Specialists (who can work in teams as lead tutors for BMCs and team tutors for GPCs)
- ‘Challenge Leaders/Designers’ (who can implement complex, cross-disciplinary challenge-based scenarios with groups of students) and who can play a role in the pedagogical design, updating and validation of ‘challenges’.
- Coaches (paraprofessionals, who provide individual mentoring and who can work with small study groups on their preparation for BMCs)
- Guidance specialists (for ongoing negotiation of personal curricula and mediation of supports required)
- Production Team members (‘challenge’ scenario design, design of resources, implementation of feedback and assessment scenarios)
- Analytics experts (supporting tutors/mentors in profiling student needs and attainment)
- Technical specialists (to oversee the digital infrastructure, although these professionals are likely to be centralised regionally)

Significantly, these roles are fulfilled in teams that are both local (immediate to the school) and networked (tele-presence collaboration and exchange). Schools, as workplaces, will mirror to a far greater extent ways of working that can be found among today’s most innovative and vibrant organisations in the creative industries. Individual talent, working in teams will be the dominant paradigm for the education profession.

### *Students:*

Individual students are more likely to be intrinsically motivated in circumstances that accommodate a high degree of choice and flexibility. In all cases, the role of tutors/mentors is critical for maintaining focus and for balancing solo, self-directed work with supportive teamwork. An indicative student activity profile will include:

- Self-directed study through digital courses for all BMCs. (Each student is assigned a coach. Coaches work with groups of students and moderate individual study and group sessions among groups undertaking the same BMC). A digital course can be followed anywhere/anytime, but because we value physical ‘togetherness’ students will have a personal study space in school and will belong to a core tutorial group (much as an employee has a desk and belongs to a core team). Coursework can also be seamlessly undertaken outside of school: digital resources and ‘place marks’ follow the learner.
- Core groups will not be confined to age cohorts, but will be formed in broader age bands (e.g., 14 to 16 together). Students will identify strongly with their core group, but will form other teams and groups in order to fulfil their selected ‘challenges’.
- Guided Portfolio Challenges (GPCs) will be undertaken sequentially, and blocks of typically 5 to 6 weeks will be allocated to complete what will amount to substantial, inter-disciplinary projects, drawing upon the core skills acquired in the BMCs.
- Many ‘challenges’ will involve active learning and creation. Students will have access to powerful visualisation, experimental and simulation opportunities in the school laboratories of 2030, including links to remote experimental and research laboratories. Art rooms and technical workshops will long have been superseded by creative ‘Fab-Labs’, where students can fabricate all kinds of artefacts (physical and digital) using traditional and digital tools for design, modelling and building.
- Personal Portfolio Challenges (PPCs) will for the most part be fulfilled outside of school. Their purpose is to enable each individual to pursue excellence and depth in a field of their choice. Many of what now count as extra-curricular activities will be brought within this domain, including music or drama performance, sports or specialised or advanced study in a particular field, not immediately supported by the school.
- A typical school day will involve a nominal 40% of time with the student’s ‘home’ group, engaged in a mix of personal study using digital courses/resources, group peer learning sessions and group session moderated by coaches or tutors. This will be referred to as ‘BMC-time’. Students will also devote 40% to 60% of their day to the particular GPC they are currently engaged in. This involves working with a different group and tutorial team. The variance (40% to 60%) is dependent on whether the student is concurrently pursuing a PPC for which a time allowance of 20% will be made.

### *School as Physical Space:*

For a new vision of education and educational practice to become a reality, the nature of schools as physical spaces will need radical reconsideration. Schools and classrooms, as we currently know them, are designed on the premise of teachers as sole practitioners and students as members of homogenous class groups. School 2030 will require removal of many walls and an opening up to provide:



- Flexibly configurable open plan spaces (studios), to host GPCs ('challenges')
- A personal space (desk) for each student within large open 'home group' areas to facilitate learning/acquisition of core competences (towards BMCs).
- Presentation areas for group work
- Tele-presence Areas to link with other groups and with external organisations
- Experimental/Simulation Laboratories for the exploration of scientific and technological phenomena
- Fab-Labs for design and artefact production
- Digitally supported gymnasias and sports facilities

**Conclusion:**

Remarkable advances in digital technologies and media are already being incorporated in today's schools. However, in 2013, our frame of reference remains the teacher and the classroom. Innovation is discussed in terms of creative classrooms, rather than creative schools or creative communities. This is set to change. Education is fundamentally a process of constant creation and re-creation. As in other spheres of creativity, space matters, whether physical space or virtual space. Space conducive to creativity and learning does not arise in a haphazard way. It requires thoughtful design, and form should follow function. Open Education, at least insofar as it applies to our children up to the age of 18, represents an opportunity for creative engagement with the very best and most comprehensive digital resources, curated and tutorially supported by challenging and engaging tutor-mentors, in circumstances that place a high premium on the combination of individual and social learning.



## **How will the digital textbook of 2030 solve Meno's paradox?**

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*No doubt, the future digital learning resource will engage the learner in a Socratic dialogue; the challenge is to come up with the roadmap how to get there.*

From a learner's perspective, learning is a paradox, first highlighted in Plato's dialogue Meno: How can we seek something we do not know? For thousands of years schools and universities *have known* and told their students so. Educational technologies shifts the locus of control to the learner and might lead to a new era of learning "tailored for and controlled by individuals as they expand their knowledge, fluidly moving across learning contexts, interacting with others" [1]. But how will these individuals learn without being told? Meno asked Socrates: "How will you inquire into a thing when you are wholly ignorant of what it is" – and Socrates answered that the slave boy "will discover by seeking the truth in company with me". What kind of company will the learning contexts of the 21st century offer that will allow the learner to bootstrap the knowledge society?

To be honest, up till now the Socratic dialogue has not been a great feature of formal education. Often the textbook has carried the curriculum and led out the path of learning. The textbook will play an important role in this century, too. But the role will be different, and this vision paper seeks to understand the deep transformation of the textbook when it goes digital and is being projected on any surface anytime and anywhere the learner may be located in 2030.

### **The textbook of today – modelled on paper**

Schoolteachers know that the textbook has gone through a thorough process with publishers working hand in hand with expert authors and curriculum committees. If you stick to the textbook as a schoolteacher you are safe; - the learners will pass the exam. Updating textbooks is a slow process. US school leaders are talking about a seven years cycle and are eager to come up with a decision to make a shift to digital textbook now, or they have to wait another seven years [2]. (Within Higher Education, at least at introductory level, textbooks also play a major pedagogical role, giving the structure to the lectures. Here the revision cycle is less important as one textbook could easily be replaced by a book written by another author.)

Advanced graphical design characterises today's paper textbooks which are richly illustrated and structured to expose structure, semantic relevance of different parts of the text, and often enhanced by links to external resources, and by simple assessments at the end of each chapter.

Even if we in 2013 find experiments with dynamic e-textbooks with rich media content and communication with external services, the next seven years will not see fundamental changes.

Publishers will insist on formats and technologies that mimic the paper textbook. Valued features are built into the paper book using fonts, graphical design elements, and different types of paper – it is impossible to ignore that people care deeply about century-old print traditions. The EPUB3 format, which builds on open web standards and HTML5<sup>1</sup>, is just published and hardly implemented in ebook readers even if everybody seems to agree that this is the way forward after EPUB2 became the dominant ebook format (for novels). It needs to be proved that EPUB3, with the style sheets modules, the scalable vector graphics format, OpenType and Web Open Format fonts, and the scripting language, is delivering the same quality textbooks electronically as we are used to on paper.

In 2013 the EPUB3 format already makes it possible to include multimedia formats, interactive parts as well as utilizing just parts of the books – however, it is usually still a monolithic, unchangeable artifacts which has to be used by teachers and learners as-is. From a market perspective, the general ebook market is driven by individuals seeking to harness the mobility and ease of access provided by new mobile devices; however, the forces that shape the e-textbook market are more complex. One thing is what students want; another is the pedagogical consideration of the teachers, school authorities and the universities. Experimentations and deliberations take time, and in the meantime the OER movement is challenging the traditional concept of a learning resource; and the new MOOC movement [3] is questioning the business models of traditional universities. In 2013, the textbook is under siege both from internal and external forces; both the publishers and the educational community seem to be bewildered about the future of the e-textbook.

### **The dissolved textbook of 2020**

The dissolution of the textbook as an embodiment of an educational unit (think “Algebra”, “History”, “English”, etc. and the traditionally associated textbook), both for schools and higher education happened earlier than expected in 2013. For the universities, it was the explosion of MOOCs (Massive Open Online Courses) that all of a sudden made open content a necessity for course design. An abundance of content of a finer granularity than a whole course or a whole book made the concept of a book redundant. Very early it became clear that EPUB3 allowed pointing to any item within an e-Textbook, and that the question of using chunks of a book in different contexts was more about the business models of the publisher than technical barriers or answering to the needs of the learners.

#### *A new empowering learning design tool*

Some new open source software contributed to this development, empowering the teachers as content curators. New learning design tools made it easier for the teachers to draw lines between knowledge structuring elements (curricula and lesson plans, competency frameworks, learning outcome descriptions, etc., – cf. the CEN InLOC specification<sup>2</sup>), their personal toolkit of pedagogical methods, and the learning resource. In 2020, the teachers no more need the textbook to provide the structure to the course or subject they are teaching. The personal learning design tool knows the courses Ms. Hansen teaches and the courses’ educational contexts due to the new curriculum, competency and learning outcome interoperability standards published as European norms in 2015. She also has a good grasp of didactical patterns that is used in her community of practice. The magic happens when the tool points to a learning resource. Then Ms. Hansen sees how well it fits with the curriculum,

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<sup>1</sup> <http://www.w3.org/TR/html51/>

<sup>2</sup> <http://wiki.teria.no/display/inloc/Home>

how it is been used by her fellow teachers; and she gets indications of the quality of the resource, suggestions of supplementary resources that could serve the full range of her student group, e.g., students with special needs, etc. Content curation is now a well-integrated part of the teaching practice, and there is no need to lean on static structures built into textbooks.

### *The new market of 2020: A peaceful co-existence of OER and commercial content in a service industry*

A big disruption was caused by MOOCs in Higher Education (and in the meantime even some real open approaches emerged in that field). For schools, the book as unit of sale was kept a bit longer, but also here the impact of the OER was so strong that the concept of a monolithic textbook was dropped. Teachers are now free to choose their initial and additional materials. Each teacher (and learner) has an annual budget as part of tuition revenues to get the best available resources fitting their learning styles. The publishing industry still produces high quality top-end modules but teachers and learners can use, modify and combine as it fits their context. New services have created new business opportunities around quality assurance, market place, content discovery, and content aggregation.

### *EPUB3 a website in a document*

The learning design tool Ms. Hansen is using is able to package the learning material in EPUB3 format, which is able to deliver a website or an app) as a document. Thus, the learner has access to rich content, either online or offline. Ms. Hansen's own ideas of structuring and sequencing of the particular subject, question and tests, additional learning material, etc. are clearly represented in the publications. Towards 2020, more and more collaborative services were added to the e-textbook readers which allowed the learners to share annotations, report their results to external services and get back data they could use to align their learning with the expectations of their teachers and the practices of their fellow learners. The e-textbook readers supported also the learners' accessibility and usage preferences, adapting the learning material in ways that often surprised Ms. Hansen. She did learn quite a few new aspects of the subject she taught, thanks to her students reporting what their e-textbooks came up with.

### **The role changing e-textbook of 2030**

Ten years later, Ms. Hansen is still a teacher in secondary education, but her role has changed. Now she works with individual students who have asked for help or whom the learning support system has assigned to her. Sometimes she feels like a fifth wheel on the waggon; there are so many automatic processes now supporting the learning work of the students. But she knows that sometimes the role of Socrates needs to be acted by a human being, Ms. Hansen.

### *Changing paradigms – from availability to filtering and organizing information, knowledge and skills.*

E-textbooks have already been available on many different devices for many year but now a change of paradigms is mainstreamed – basically any object and any place offers many e-textbook parts as ambient services – the internet of things allows each table to provide personalized information whoever is sitting around it. Field trips and basically any life situation have become learning adventures as 1) all information is available through ambient learning opportunities, accessible and storable as individual e-textbooks; 2) all experiences of learners are captured by wearable devices; 3) anyone can connect dynamically; and 4) anyone can share experiences with their peers in real time. This technology-shift has also led to new challenges and key competences – information, communication and contact filtering have

become learning outcomes in primary school. Organizing, filtering and assembling meaningful information and knowledge and building individual competence profiles have become the key in education. Ms. Hansen helps, records, and discusses which learning opportunities are to be chosen by each pupil and how groups fit together.

### *An adaptable learning system*

What started as an e-textbook in 2013 has developed into an adaptable learning plug-and-play system where the learners' devices are connected through the cloud to systems used by other students, teachers, schools, content providers and society at large. Looking at the evolution of this system the following steps seemed to have made an impact:

- Within 2020 all educational publishers had adjusted their business models so the textbook as a commercial unit ceased to exist, leaving the field open to educators to mix and match content to serve their pedagogical ends.
- Just after the new e-textbook format was published, it became clear that all content within a package could be referenced and pointed to from external services. A reporting API was developed allowing communication between and about every single asset of an e-textbook and services that started to be developed by third party companies.
- Within 2020, all the educational “structuring” information was fully integrated in the e-textbook. The manifest file of the e-textbook could hold information about relationships to curricula, competency frameworks, learning outcomes, etc. - and their alternatives. This enabled all kinds of adaptations based on thematic perspectives, usage profiles, co-learner interaction, just-in-time requirements from knowledge contexts, etc.
- Within 2023 advanced formative and summative assessment services were available from any assessable chunk of content. Advanced caching made these services available to the learner also in offline mode.
- During the years 2015 - 2030 learner analytics data became the game changer, as these data became massively and openly available for use within most learning support tools.
- Key technologies have changed learning opportunities, learning experiences and how they are organized and shared. Learning is more interactive, group-oriented and learner centered than ever. But: The next generation of learners is coming...

### *To seek the truth in company with...*

So, how did this development solve the Meno's paradox? Would the e-textbook of 2030 be able to assess the Zone of Proximal Development [4] so that the appropriate next learning challenge could be presented? First, the combination of new technologies, new formats and new tools have dissolved the boundaries between learning materials and learning activities. The e-textbook (not recognisable by a 2013 learner) and the learning activity, e.g., dialogue with fellow learners or the knowledge field, are one coherent resource for learning. Second, the tracking of your learning activity covers much more than assessment results. Eye movements and other bodily reactions are available as data, and so are live recordings of conversations with fellow learners and mentors. These data are accessible for learning analytics and the results come back as very targeted suggestions for new tasks, new material, new directions, new collaborative activities, etc. raising the bar just so you are able to take the next step towards your learning goal.

The system will never be perfect, and there will always be the need for a teacher or someone to “seek the truth in company with”. But for the average self-organising user, structured learning is also feasible with the 2030 generation of digital textbooks.

- [1] Isobel Falconer, Allison Littlejohn, Lou McGill (2013) *Fluid learning: vision for lifelong learning1 in 2030*, available at <http://blogs.ec.europa.eu/openeducation2030/vision-papers-on-open-education-2030-part-1-lifelong-learning>, accessed 2013-04-09
- [2] Fletcher, G., Shaffhauser, D, and Levin, D. (2012). *Out of Print: Reimagining the K-12 Textbook in a Digital Age*. Washington, DC: State Educational Technology Directors Association (SETDA)
- [3] Europa Press releases RAPID (2013) *Vassiliou welcomes launch of first pan-European university MOOCs (massive open online courses)*, April 2013, see [http://europa.eu/rapid/press-release\\_IP-13-349\\_en.htm](http://europa.eu/rapid/press-release_IP-13-349_en.htm) (accessed 2013-04-23)
- [4] Vygotsky, L. S. (1978). *Mind in society, the development of higher psychological processes*. Oxford: Harvard University Press.



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[The European Commission requested vision statements on Open Education for Schools in 2030, presented in creative format. Here [Paul Kelley](#) presents a vision statement in the form of a blog written in 2030 on the progress of Open Education since 2013. Hyperlinks are to materials that show some of these developments could be based on existing practice.]

## Open Education for Schools: Progress Review 2030

Today Europe leads the world in open education for schools. Since [Rethinking Education](#) was launched there has been rapid progress. Open Education complements school education by focusing on fundamental skills for adult life: literacy, numeracy, languages, sciences, entrepreneurship and health.

### *Student experience*

Students have responded enthusiastically to Open Education from the very beginning: the digital world is one they feel comfortable in, whether socializing or learning. Students routinely study longer and learn more through Open Education courses than traditional teaching techniques. Almost every student in Europe now studies at least ten hours a week online in schools, often in specially designed spaces. This reflected the success of Knowledge and Innovation Enterprises for Students (KIES) framework that has led to students creating hundreds of thousands of open learning resources and projects. Many of these passed the quality threshold for resources and are widely used in school. In 2024 the games and predictions sites alone attracted 58 million unique users in 24 hours (when awards for student KIES teams were announced). The only



Open Education provision that exceeds this level of engagement is *Progress Dashboard* where students track their own learning and health, seek support from their peers and others, and organize their learning to maximize achievement.

Attitudes to school and learning becomes more positive the greater the integration of Open Education into school life, a finding found in all countries and with students of all abilities. This is linked to rapidly improving achievement. Open Education has made [the biggest impact in language learning](#), helping most children in school to be confident in three languages.

*When I started school we sat in class listening to the teacher. Now schools feel different. I really liked new approaches like High Intensity training for fitness. I'm studying to be a doctor now, and I put that down to taking the Open Education course on healthy adolescent brain development.*

*Jean*

## Teacher experience

Teachers have embraced change, innovation, and rigorous methods. There were challenges in the first few years in adjusting, but by 2020 82% of teachers reported greater job satisfaction. Key features were the chance to work with colleagues in the new Knowledge and Innovation Enterprises for Teachers (KIET) framework, and learning about other disciplines such as health. The greater flexibility teachers now have to help children learn is consistently the highest cited reason for greater job satisfaction.

The early decision that Open Education resources should be a mixture of commercial and teacher-created resources has proved a success. Like students, teachers report that Open Education courses



are engaging and effective. These courses have built upon the earlier eBook, [innovative training](#) and [Open University](#) approaches. Improvements in learning have come from the combined use of collaborative inquiry, peer learning, learning diagnostics, personalization, and real-world emphasis. Teachers feel the Open Framework of skills recognition for students and for teachers has worked exceptionally well.

Complex systems data analysis of student learning from commercial / teacher resources is being used to improve all education, and dynamically improve open resources in real time. Europe is now the global leader in school education ICT-enabled resources, exceeding €10 billion sales in India each year since 2019 and a €17 billion annual contract with China from 2027. Although many teachers now work in business creating online training, many more businesses work in education.

Partnerships between education and research, health, ICT industries and science have created a range of schemes where professionals teach in schools, and this enhances the skills of teachers and students alike.

## Organizational change

The prominent contribution of

business and employers to Open Education has led to a dramatic increase in students taking employment-related courses, and [business-sponsored degrees alongside employment](#), notably in digital industries. Businesses helped improve financial models so the Open Education Knowledge and Innovation Enterprise itself now generates a profit of €1.3 billion, continues to increase the market size, and has simple mechanisms for business charging and shared data analysis. Independent reports consistently rate it as highly efficient financially and organizationally. Open Education has a Europe-wide skills role too. It provides

*My job seems so different. All my students have Open Education time, and I'm free to work with my colleagues, or a single student as needed. So much assessment is done online or by student self assessment, we have the flexibility to learn ourselves. I'm studying business, looking to set up a company. It's exciting to work here. Zena*



assessment, recognition and certification, as well as defining a curriculum, for these skills. There has been a continual improvement in the percentage of students achieving both foundation skills and higher skills since 2021.



Educators now utilise their greater knowledge of research in health, neuroscience and science in their approach to learning for children and adolescents. This has changed school practices: [later school starting times](#) for teenagers, [open plan learning areas](#), intense learning techniques, and other evidence-based innovation are now the norm in school practice. The impact of science on the activities in

schools has been cited by over 70% of students as a key reason for going on to study STEM subjects and STEM careers.

Research-based approaches have flourished in part because Open Education supports big data analysis in schools, and uses learning analytics in the creation and development of all its courses. Learning analytics, are also freely available to teachers and students. The use of good quality data and analysis now informs most aspects of school education, and Open Education consistently leads further development.

### *Society and economy*

#### Addressing emerging skills

requirements, fostering employment, active citizenship and inclusion remain on-going challenges, though much progress has been made. There have been major economic successes: creating a single education market across Europe, protecting copyright and generating educational services that have global appeal. Europe has become the global leader in open education, translation services, and learning analytics. European companies and public/ private enterprises currently have 46% of the global market share for services to schools.

Attitudes towards education in schools have changed markedly since 2013, with employers now confident education meets their needs and the wider needs of society. European


*School leadership is completely different. In this school we don't feel so isolated from other organizations and support. I know teachers and students learn more, and faster, than they used to- and the school has a happier, more professional environment. We're closely connected to the real world now. Personally, I feel I am supported by many organizations, and we're all pulling together across Europe for our students.*

*Alexander*

Employer surveys show skill levels, ability to work in an entrepreneurial way, and innovation characterize young applicants now and continue to improve. Courses created by industry have been remarkably successful in the last 10 years, and the growth of jobs with degree studies using open education methods has risen to 37% of all first jobs advertised.

Coordinated projects in Open Education with health, neuroscience and technological health monitoring have led to exceptional improvements in the health of students. Informed by research organizations and complex systems science, it has become possible to implement preventative health and education initiatives on [sleep deprivation](#), obesity, cardio-vascular fitness, emotional and mental health and health awareness. These interventions have had a remarkable impact over the last 10 years on child and adolescent health. The 180% fall in students taking anti-depressants and 78% fall in adolescent suicides since 2018 are, in themselves, major achievements. These changes have been largely driven by the enthusiastic support of education systems, governments, researchers, and industry. A key element has been European-wide Open Education courses in health and neuroscience for students, families and teachers.

Open Education is a world-leading Knowledge and Innovation Enterprise that has achieved high impact, low cost outcomes since its formal creation in 2015. It is now embedded into the education process for all European children, and continues to develop services to students and families of exceptional quality. It has also made significant contributions to the economy and wider society.



*The World Health Organization considers European progress 2020-2030 for children and adolescents as the best in the world. European initiatives in education, health, neuroscience and technological health monitoring have had a huge impact since 2020. Our experts particularly praise the impact of Open Education for Schools in enabling these significant changes.* Director-General, WHO



## School education in 2030 and beyond – Empowerment through personal learning navigation

W.J. Pelgrum

*Learning in schools will in 2030 be a continuation of the intrinsically motivated learning processes that characterize early childhood development, which will be facilitated through Personal Data Spaces from which all information needed for learning navigation, monitoring and certification will be derived, all based on invisible technologies.*

### Background

Since the mass introduction of ICT in societies there has been a continuous debate about the need for fundamental educational reforms. This has in recent decades resulted in numerous initiatives at all educational levels aimed at realizing innovations in anachronistic education systems which were in all their characteristics suited for industrialized societies.

Most of these innovations were deemed to fail, as they were based on short term visions and planning, too much atomistic<sup>3</sup> and not taking into account that all system elements need to be tuned in order to realize synergic power for change.

Although 2030 is for education still a medium term perspective, our current dreams will keep us awake and oriented on taking steps towards necessary innovations.

### A Leitmotiv for education in 2030 and beyond

Most children have from birth a genetically determined intrinsic motivation to intensively explore and learn about their environment. They see, hear, taste, feel, endlessly repeat and automate behaviours for interacting with their environment in order to be able to survive in their social environments. Depending on the amount of stimulation, feedback and genetic dispositions (curiosity, anxiety, strength, etc.) some develop faster than others. Often their creativity in dealing with new situations is fabulous. The period between zero and four years can be conceived as the ultimate blueprint for open education.

When children enter compulsory education their intrinsic motivation to learn is slowly replaced by a system of extrinsic motivators: teachers determine what is learned and when, how it is appraised, distinguishing the good from the bad learners, sorting children into different educational tracks which continues until the end of compulsory education. Many children who were at the start of their life enthusiastic and creative learners discover that they are qualified as not being able to learn and their school experiences become, due to extrinsic

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<sup>3</sup> For example: introducing new instructional methods without changing curriculum, organizational, assessment and examination standards; changing curriculum objectives without changing examinations contents; introducing ICT based learning methods without sufficient teacher training; neglecting ownership issues while mainly focusing on top-down changes.

feedback, intrinsically demotivating. This is reinforced by experiences that quite often it is unclear to them (as well as their peers and parents) why certain contents need to be mastered.

An overarching Leitmotiv for education in the future (taking 2030 as intermediate benchmark year) will be that the whole education system is focussed on fostering and further developing the intrinsically motivated learning aspirations which are so characteristic for early childhood development. The task of education actors is to help students to engage in learning opportunities that match their aspirations and to offer guidance in increasingly developing a sense of ownership and skills for managing learning processes while continuously (co-) monitoring progress over time.

### **Some major implications**

Although the Leitmotiv seems simple, it will have major implications. First a general implication is described below and next consequences for some issues which were mentioned in the Call will be reviewed.

#### **General implication: need for personal learner data**

In order to help children to engage in learning activities that are likely to evoke their interest and lead to success experiences a lot of information needs to be continuously and instantaneously available and updated (e.g. zones of proximal development, earlier successful experiences, language skills, etc.).

However, our current education systems stem more or less from an industrialized model of mass production, which fortunately allows (or even forces) every individual to participate, but unfortunately cannot sufficiently cater for the huge variation in individual idiosyncrasies, preferences and needs. Although theoretically possible with very high teacher to student ratios, this would be financially unbearable. Moreover, educational actors currently do not have the expertise and tools for collecting and processing large amount of information about individual learners and matching this with optimal leaning opportunities while at the same time consequently monitoring progress over time. Also sophisticated tools for managing large amounts of information about the characteristics of an individual learner over a long period of time are not available.

In the future each learner will have its own personal data space (PDS) in which all relevant data about the person are stored (in an absolutely privacy guaranteed way<sup>4</sup>). All these data can be collected by observing each individual when engaged in several activities (virtually through algorithms or real through perceptions of ‘relevant others’).

In 2030 major steps have been taken to fill PDS on the basis of educational activities in which learners participated. Many of these activities will be virtual and each virtual environment will have data collection components that will store data in PDSs. These data can (automatically and/or by researchers) be processed for further extractions of composite indicators on a huge range of learner characteristics (e.g. intrinsic motivation, student competencies, aspirations, etc.).

These PDSs, which can already be initiated when children are very young (if parents see the added value) but at the latest when children enter compulsory education, will influence all the

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<sup>4</sup> A distinction needs to be made between data and information. With the consent of the learner (at young age, the parent) data may be extracted for indicator construction and monitoring purposes.

other components of the education system (management, organization, curriculum, quality control, teacher training, certification, etc.).

Some illustrations, in terms of topics mentioned in the Call, will be shortly shown below. Although the proposed orientation will have implications for all topics mentioned in the Call, space consideration prevent a review of all of them.

## **Learners**

### *Peer learning and interaction*

Peers will play a very prominent role in the learning environment of learners. In particular peers will be partners in the real and virtual learning spaces in which learners will be engaged. They will cooperate in solving problems and will be sparring partners during drill and practice exercises that are regularly undertaken in order to create a sound basis of general knowledge (specified in scientifically underpinned curricula) needed for complex problem solving. A very important function of peers will be to provide data for the personal data spaces of learners through perceptions about their strengths and weaknesses.

### *Learner-teacher roles*

Teachers will be high level experts who will be able to help learners to optimize the match between their intrinsic motives and their actual competencies with appropriate new learning opportunities. They will be able to interpret indicators from PDSs and to monitor the progress that learners are making, signalling obstructions and helping to find appropriate solutions. In the pre-compulsory period, this will be the task of parents who will have the opportunity to use PDSs for their children. They will provide data about the pleasure children experience when engaged in real and virtual games, so that the software can (in combination with the virtually 'observed' behaviour of children) generate suggestions for follow-up activities, from databases in which all learning opportunities (and their characteristics) are stored. Also during compulsory education parents will be actively involved in monitoring and guidance.

### *Learning practices and outcomes*

PDSs contain information about all learning experiences in which learners have been involved. Their activities in virtual environments results in estimates of their latent competencies. Data about the outcomes of their behaviours in real life situations will be derived from perceptions of peers, teachers and parents (note that inter-subjectivity is a form of objectivity).

### *Linking formal and informal learning*

The distinction between formal and informal education will be increasingly blurred, as students are continuously learning (just like pre-school). Parents will be stimulated to buy educational certified virtual games for home use that can be used for feeding data into PDSs of their children.

### *Learner engagement and motivation*

With regard to engagement and motivation we will see the most dramatic change in comparison with 2013, because the whole system is oriented on continuously stimulating motivation, so that learners are optimally engaged.

## **Teachers**

### *Teacher-learner interaction*

Teacher-learner interactions will be characterized by guidance and help. Teachers are experts in using indicators from PDSs of learners and are brokers in helping them to match aspirations and learning opportunities.

#### *Teacher training and collaboration*

Teacher training is continuous, because learning opportunities are in a constant state of flux, amongst others as a result of increasingly sophisticated virtual environments, labour market changes but in particular because technological possibilities are constantly improving.

#### *Pedagogical methodologies and practices*

Teachers will (and are skilled) in particular to play a very important role in fostering and stimulating learners' intrinsic motivation by showing (when necessary) how fascinating and rewarding it can be to be engaged in certain learning activities. They also stimulate the building of peer groups and are able to foster group cohesion processes, team building, etc.

#### *Quality and innovation*

PDSs allow for the extraction of a constant stream of information about the added value of learning processes at individual, school and country level. Large data collection exercises for assessment programs that are known nowadays (PISA, IEA, national assessments, etc.) do not longer exist. All data needed for quality monitoring at individual, school, national and international level will be extracted from PDSs. Solutions for empirically demonstrated weaknesses will be found leading to innovative approaches.

#### *Content and scope of “teaching”*

Teachers are motivators and generalists who are experienced and master all core curriculum objectives. In addition they are specialists in certain curriculum areas. They are not all necessarily “instructors”, although some have the reputation of being fabulous lecturers, who are regularly (in reality and virtually) performing in front of a large learner audience.

#### *Teacher engagement and motivation*

As implied from the above, teachers are fully engaged in the learning navigation of students. They are trained and selected on the basis of their enthusiastic motivation. The status of teachers has increased tremendously since 2010. They all have also their own PDSs which are used for the same purposes as is the case for all learners.

### **Organisational aspects**

#### *Assessment, recognition, certification*

Final examinations and assessments will not longer exist in their current form. Measurement will be unobtrusive. Competencies, aspirations, etc. will be extracted from PDSs. Certification will be an ongoing automated process based on data from PDSs.

#### *Curricula and Learning Objectives*

Curricula will describe which basic core competencies learners need to acquire. Although some competencies will be the same for all learners, when learners grow up these competencies will increasingly be derived from career aspirations (therefore cooperation with the market sector is crucial).

There will be European frameworks for describing the minimal competencies students need to acquire for participating at particular levels in (virtual) educational environments. This is an important element for PDS architecture.

#### *Technological aspects*

Architecture for PDSs will be based on European standards. Virtual educational environments will be certified if they contain a number of components that are needed for learning navigation, such as:

- Competency inference modules
- Mapping of virtual activities with curriculum frameworks
- Data delivery to PDSs
- Registration of learning opportunities encountered by learners

Virtual environments will be linked to and interact with real environments

A characteristic of future educational technologies will be that they will be invisible. Inventions like Google glasses will in retrospect be qualified as utmost primitive.

#### **Socio-economic aspects**

##### *Equity and quality*

PDSs will offer powerful opportunities for monitoring equity and quality issues. They can have a preventive function by signalling in very early stages potential groups that are at risk in terms of intrinsic learning motivation, learning opportunities and outcomes.

##### *Addressing emerging skills and business needs*

The responsibility of business will be to specify and update profiles needed for current and future jobs. This will be the basis for curriculum mapping and matching with PDSs so that learning navigation can take place.

##### *Fostering employment, active citizenship and inclusion*

The involvement of business (job and competency profiles, linkages with learning opportunities, certification) will contribute to a better match between offer and demand leading to improving employment possibilities for citizens. As certification is based on PDSs, citizens are better able to 'proof' their qualifications, counteracting stereotyping associated with ethnographic characteristics. Employers are stimulated to randomly select a candidate for a job from those who are qualified according to their PDS.

#### **Conclusions**

Personal Data Spaces will offer the key to building sophisticated learning navigation systems, which will empower the learner to maximally profit from and enjoy the learning opportunities that education systems will offer in the future. The European Commission will play a leading role in promoting standards and frameworks that will constitute the fundamentals for technology enhanced education in 2030 and beyond.



## Open Schools 2030

Pierre-Antoine Ullmo

*P.A.U. Education*

*Major changes will take place by 2030 if school education is based on the active participation of the students themselves; the enthusiasm and engagement of digital natives constitute the new milestone for our educative systems.*

All prospective studies that lead to the year 2030 reveal the importance of knowledge and individual empowerment to sustain economic growth and social cohesion. “Rethinking education<sup>5</sup>” has become a central policy objective for the 20 years ahead.

Designing this change can certainly be seen as a prospective exercise. Children that will attend school in 2030 are not yet born; Half of their teachers are not yet hired<sup>6</sup>; Many of the professional careers they will choose are still unknown, and much of what they will need to learn for their future jobs isn’t taught at schools today; Most of the 20-year-old innovators and entrepreneurs that will widely influence the way these students learn and live are currently about to enter pre-school<sup>7</sup>. Many questions line the horizon of 2030 regarding core issues like upcoming technological innovations and the rhythm of economic growth. As such, experts’ creativity and inventiveness are continuously challenged and all ideas are welcomed.

Nevertheless, designing change is not (only) a prospective exercise. Even though most of our current policymakers, researchers and experts will have retired by 2030, their vision and thoughts will engage structural changes that determine how school education will look 20 years from now.

Educative systems are accustomed to change. Some would say that they are in a state of constant change. Over the past 30 years, all EU countries have been continuously engaged in a deep reflection regarding the future of their educative systems. The rhythm of these organizational and curricular reforms during this period more than doubles that experienced since the turn of the 20<sup>th</sup> century<sup>8</sup>. Are we simply facing yet another cycle of change that will yield to a set of new reforms? Will it constitute a “controlled” change to adapt schools to new technological, social and economic conditions? Or are we on the edge of a true revolution?

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<sup>5</sup> Rethinking education: Investing in skills for better socio economic outcomes, communication, European Commission, 2012

<sup>6</sup> Key data on education in Europe, Eurydice - Eurostat, 2012

<sup>7</sup> Mark Zuckerberg created Facebook when he was 18 years old.

<sup>8</sup> 100 years of Educational Reforms in Europe, Christelle Garrouste, JRC, 2010.



## **The Times They Are a-Changin’**

Over 20 years ago, Seymour Papert<sup>9</sup> argued that: “children will (no longer) sit quietly in school and listen to a teacher give them predigested knowledge. They will revolt.” The revolt didn’t take place at the time and our schools didn’t change (much).

There are several good reasons to think that times are now riper for a “revolt” of great magnitude. In countries like Spain or Portugal, more than 30% of early school leavers and more than 50% of unemployed youth aged over 18 throw the very meaning of school education into question. In the USA, we have just witnessed the first cases of higher education students filing a lawsuit against their law school for creating false expectations with regards to their future employability<sup>10</sup>. The failure of our societies to provide work to youth and to fully integrate them into society may mark the end of school education as we know it until now: a continued process that should lead children and youth to progressively gear up for their futures as successful professionals and responsible citizens. Is there time before 2030 to adapt our school education systems in order to prevent resounding failure? Will we be able to control the change?

Whether or not we believe we have sufficient time in which to act, 2030 is but a generation away and many wonder why this deep transformation didn’t take place sooner. The last 20 years have shown us how long it takes educative systems to adapt to the requirements of a changing environment in all its social, cultural and economic dimensions. How can we be sure that we will succeed in changing systems that have shown such strong resistance to change?

## **An Open Education Model for Schools?**

Naturally, our first assumption will be that the 2030 school education is (pre)designed. Experts agree that major changes are required in the way that learning is delivered, students are motivated, teachers are trained, and schools are managed. Education needs to open up to new contents, teaching practices and tools. A more individualized learning path and flexible core curriculum are among the key ingredients to this transformative process. Technology is seen as one of the main drivers to achieving major transformation both in and beyond the classroom. These ingredients are central to the “open education” initiative upon which European policymakers have based great hopes for a rapid metamorphosis of school education.

An Open Education school system emerges from the many studies and innovations that abound these days. If we believe in the “market trends”, all schools, students, teachers will be fully equipped with computers, laptops, tablets, smartphones, individual supplementary devices and Internet connection. Learners and teachers will access cloud-based applications through a web browser or mobile app. Learning platforms will provide students, teachers and parents with an educational space on the web and online access to classes, class content, tests, homework, grades, assessments, and other external resources. Digital textbooks replace their traditional counterparts. Pupils will access free digitalized learning materials and teachers will prepare their lesson plans by using, adapting and redistributing materials available in the public domain or released under an open license. Contents will be available on all electronic devices including second generation smartphones and tablets. Specialized applications and e-learning solutions will meet students’ needs for each curriculum subject. Educational games

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<sup>9</sup> The Future of school, Discussion between Seymour Papert and Paulo Freire, Seymour Papert, 2000

<sup>10</sup> “Lawyer glut prompts suits against law schools”, Maura Dolan, Los Angeles Times, April 10, 2013.

will be widely used to teach, expand and reinforce key subjects and concepts. School and classroom design will evolve towards more inspirational spaces for teaching and learning. Teaching and learning communities of practice will flourish, nourished by continuous sharing of information and experiences, and will be central to the development of Open Education resources. Children with measured disabilities will get focused instruction in one-on-one or small-group settings. Those with more severe disabilities will benefit from "assistive devices" in the regular classroom environment. Learning analytics tools will assess students' individual learning within and beyond the classroom with the objective of adapting pace and contents to their needs and capacities. Personal Learning Environments (PLE) will help learners take control of, and manage their own learning.

If we follow these guidelines, the 2030 school system will be a hybrid model in various ways:

- A hybrid model of learning, which combines a "limited core curriculum for teaching the rigorous thinking and argumentation specific to a field"<sup>11</sup> with an inquiry-based "hands-on" approach supported by continuous exchange of experiences taking place in niche communities of practice;
- A hybrid model of learning places combining innovative classrooms and out of school learning experiences at home, in the surrounding community or at the workplace;
- A hybrid learning timetable where children will go to class "when they want to and when they need to"<sup>12</sup>, and will dedicate up to 90% of their remaining learning time to less formal or interactive learning experiences;
- A hybrid technological model, which combines computers, tablets and second-generation smartphones that can be accessed in and out of school.

### **Resistance to Change**

This static picture reveals none of the potential resistance and constraints to change. Technology has been around for the last 20 years in one form or another. At the dawn of the Internet era, Papert wrote that technology was "going to displace school and the way we have understood school." He saw the "fundamental nature of school coming to an end". However, 20 years later schools are still around, and remain largely unchanged. The same buildings host the same classrooms with a standard spatial organization and the same "curriculum dictatorship", even though core curriculum has changed many times in every country. What is taught remains more important than what is learned.

Schools have not evolved, yet students have changed drastically. School children belong to the generations who have been raised in a context where digital technologies form an inextricable part of daily life. The so-called *New Millennium Learners* "NML"<sup>13</sup> or *digital natives*<sup>14</sup> spend the same amount of time on electronic media per week as an adult at the workplace.<sup>15</sup> When children go to school, they already know lots of things that schools will never teach them. We have (re)discovered that children have an incredible ability to learn by

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<sup>11</sup> New Learning Environments for the 21st Century, John Seely Brown, 2005

<sup>12</sup> Seymour Papert, idem

<sup>13</sup> The New Millennium Learners: Challenging our Views on ICT and Learning, Francesc Pedró, OECD-CERI, May 2006.

<sup>14</sup> Mark Prensky, creator of the expression "digital native".

<sup>15</sup> From consumers kids to sustainable childhood, Editor: Daniel Yeow, Worldwatch Institute Europe, 2012 (Danish survey: "Totalling 41 hours and 30 minutes a week in front of a screen; children's media use is essentially the same as an adult's working week").

exploring, and in specific contexts, to go as far as teaching themselves. They can access knowledge when they want to and when they need to. School is, in fact, the only place where they can't freely exercise these abilities. The vast majority of teachers are still unable to use the technology to which they have access in a creative way for educative purposes. Why should a child study Rome when the videogame "Cradle of Rome" gives them the opportunity to build Rome every day? In the words of Larry Cuban<sup>16</sup>, teachers "still use the laptops to sustain existing practices in the classroom."

It remains unclear how schools should and could transform themselves to better respond to the needs of these "NML" and the society in which they live. On the organizational side, several questions are raised. Are we aiming at fewer pupils per classroom? Even in a no change context, classrooms will certainly experience a decrease in the number of students, due to demographic trends<sup>17</sup>. Will we be able to invest heavily in teachers, in order to recruit the best talents into teaching (and among the best, the very best in the most challenging schools)? Over the past four years, we have seen how uncertainties regarding economic growth rapidly translate into budgetary cuts in education.

On the pedagogical side, many question marks also remain. How will we address the need for greater creativity in the classroom? Do we advocate – as Paulo Freire did in the 80s – pedagogy of the question (rather than of the answer)? Should we prioritize activity-based learning rather than traditional lecturing as in the flipped classroom model? Will we substitute - in words of John Seely Brown<sup>18</sup> - a school of "learning about" with a school of "learning to be"? The answers will depend largely on our capacity to engage teachers in inventing new teaching practices with which to achieve these new pedagogical objectives, and encouraging them to fully utilize the new teaching technologies at their disposal.

### **Changing our Expectations**

Is it therefore reasonable to think that such a change could take place in the next 15 years? The answer is "yes" - if our expectations regarding what school education system undergo equally radical changes. We can no longer argue that "learning should be more about acquisition of knowledge, skills and competences rather than completing a specific stage in a given time in school<sup>19</sup>" - and at the same time ask more of the school. It is easy enough to state that "at a good school, children gain the basic tools for life and work<sup>20</sup>" but it is not realistic to argue that with the same resources, a good school must also enable these children "to learn the joy of life, the exhilaration of music, the excitement of sport, the beauty of art, the magic of science, the value of life, the sense of citizenship and responsibility<sup>21</sup>."

We cannot continuously extend the list of responsibilities incumbent upon schools and design a road map for change based on more flexible and responsive school system. It is not and cannot be the task of the school to solve all of society's problems.

Alone, the 2030 school will not be able to empower each individual child, ensure the acquisition of core numeracy, language and literacy skills for each child, develop vocational and employability skills, strengthen entrepreneurship competences, take a leading role in

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<sup>16</sup> Unused and Oversold, Larry Cuban, Harvard University Press, 2000.

<sup>17</sup> A fall of around 11% among those aged 5-9 is projected in the EU 27 by 2020 – Key data on education in Europe, Eurydice – Eurostat, 2012.

<sup>18</sup> New Learning Environments for the 21st Century, John Seely Brown, 2005

<sup>19</sup> Rethinking education, Communication, European Commission, 2012

<sup>20</sup> Speech by Tony Blair, University of Southampton, Wednesday 23 May 2001

<sup>21</sup> idem

preventing violence, child obesity and road accidents, and promote environmental awareness, multicultural dialogue and peace education from an early age.

It is not enough to design a school model with no classroom and transparent walls, as a precursor to changing the whole system. Even if some schools in the Northern part of Europe<sup>22</sup> look like “dreamed places”, many children in the south still sit in pre-fabricated classrooms. Even if broadband is becoming the norm, technological optimization<sup>23</sup> is far from being standard. Nevertheless, change should take place in spite of social inequalities, technological instability and economical uncertainties. This is where a broader vision of open education can make a “real” difference.

### **Open Education: A New Meaning**

The 2030 school will have to relinquish its all-encompassing ambition and get ready to embrace new partnerships. This could be the very meaning of Open Education for our schools: opening up to new alliances and to sharing their educative responsibilities with the surrounding community.

In 2030, a large proportion of learning will take place outside the classroom. Schools will be forming strong bonds with their local communities. The role of the city as a global educative setting will be strengthened. Communities of practice will flourish and be sustained through the social media. The very meaning of education should evolve towards a comprehensive participatory framework. Children should be “supported to develop their capacity to critically explore and understand the world they live in from their own perspective and life experiences<sup>24</sup>”. Under an Open Education paradigm, children will be directly involved in the governance of the settings of their everyday lives. This will occur when our need for change is nourished by innovative experiences that have developed over the years in non-technological contexts. Schools like “Escuela Nueva” in Colombia or innovative networks like Reggio Emilia demonstrate that change can take place on the margins of the system, and with the complicity and involvement of the community.

Major changes will take place by 2030 if school education is based on the active participation of the students themselves. The enthusiasm and engagement of digital natives constitute the new milestone for our educative systems. Within this context, Open Education will give children the right and responsibility to shape their own futures and the futures of their communities.

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<sup>22</sup> Stockholm Vittra school, for instance.

<sup>23</sup> Bridging the Bandwidth Gap: Open Educational Resources and the Digital Divide, Björn Haßler, IEEE Computer Society : “By allowing websites and OER content to grow in size not only do we provide a poor user experience for all users, but we make our sites virtually unusable with a slow Internet connection.”

<sup>24</sup> Children’s Participation, Roger Hart, Earthscan, 1997



## European education 2030 – open and free, integrative and sustainable – a vision

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*European education 2030 "open and free, integrative and sustainable" – based on a Common European Education Policy (CEEP) and the core elements of the European platform for open and free education media and materials, the European School Cloud and standardised digital standards and formats.*

### 1. Overview

With the adoption of the Bologna Declaration in 1999, the 29 EU member states expressed the desire to create a uniform European Higher Education Area. The European Union thus took the first measures towards international collaboration in the education sector. However, the standardisation measures were just aimed at higher education. In the field of general education, Europe-wide approaches to uniform standards are hardly feasible at the moment and the criticism of the current education systems and structures is growing.

Pupils and young people are already taking to the streets across Europe with protests and campaigns to voice their criticism of the current education standards. While the students are requesting, amongst other things, less commodification, unrestricted access to education, less schoolification in the higher education system and a democratisation of colleges and universities, the protests from pupils are directed towards the three-tiered school system, classes which are too large, and the overloading of the curriculum with content and grading. A central request is the implementation of genuine free provision of teaching materials.

Up until now, there have only been supportive measures from the European Commission for the EU member states for further development of their education systems. As part of the EU programme for life-long learning in the subprogramme COMENIUS, exchange and school development projects as well as projects to improve the level of education are being promoted. The educational policy remains stuck in the rigid and extremely heterogeneous guidelines of the EU member states and their partly federal structures and thus lags far behind the notion of "Open European Education 2030". Pan-European mobility can thus only be achieved with difficulty.

### 2. Vision for Open European Education 2030

It is still the case that the education sector at a European level attracts too little attention. However, the repercussions of a failed education policy in individual European countries are leaving their mark across the world as well and are thwarting the future of "open, free, integrative and sustainable education". The fundamental requirement and crucial resource for a democratic Europe is a sustainably organised educational system within an equal community and the identification of shared values. European identity emerges from the principle of community, shared cross-border experiences, Europe-wide exchange and comprehensive participation by and recognition of all community members. At the same

time, therefore, sustainably organised education is also a fundamental requirement for increasing European identity.

The principle of subsidiarity arranges the division of tasks between the member states and the EU in such a way that as much grass-roots policymaking as possible can be guaranteed. The education of each individual European citizen must in future be undertaken on the basis of the European community of values – with the observing of democratic principles, equal opportunities, accessibility and freedom of location – regardless of national perspectives and interests. Europe must recognise itself as a migration society which permits multi-perspective and equal participation.

The European education sector and school sector in particular must be completely reformed. The European school must become more open and integrative, inflexible (school) areas must be redefined, so that European pupils are able to experience self-determined learning irrespective of national boundaries – analogue as well as digital – and on the basis of individual advancement. In a new educational community in Europe in 2030, there would exist no separate types of schools, no class groups and no predetermined content based on rigid curriculums. Skill-oriented and interdisciplinary topics and projects are collaboratively implemented across the different years. At the centre is the constructive exchange of European pupils and teachers across national borders, free from the specifications of a rigid and incomparable assessment system (grades).

### **3. The Common European Education Policy (CEEP)**

As a first step towards implementation therefore, the approach of "European Education 2030 – open and free, integrative and sustainable" requires a common European educational landscape based on equal opportunities, accessibility and sustainable and self-determined learning and teaching, a Common European Education Policy (CEEP) and a European Ministry of Education.

#### **3.1 The European Ministry of Education**

Independent of national interests and regulations, the European Ministry of Education can bring about and implement a European education policy, properly, in a future-oriented way and multiperspectively – in view of the European migration society and its multifarious requirements and opinions. Each European pupil receives, depending on his/her own resources, a proportional basic budget for free and individual management and design of his or her education. Cross-border and collaborative projects and education are also promoted and enabled. Cooperation, and especially the exchange between teachers and students, and everyone else involved in school education are promoted using supranational instruments. This exchange also takes into account exchange semesters for teachers in other countries. The European Ministry of Education would also initiate measures for the structural and individual promotion of the implementation of unrestricted access and the standardisation and compatibility of the education systems – especially for the assessment systems and Europe-wide graduation and for both digital and technical standards.

#### **3.2 The European platform for freely accessible, open and modifiable educational materials**

European education 2030 should no longer be based, as previously, on the sovereignty in terms of topics of individual institutions and the commercial interests of individual publishing

countries and companies. The core elements for guaranteeing equal opportunities and accessibility is therefore, on the one hand, free and equal access to teaching and learning materials, whereby "free" is not synonymous with "without charge". On the other hand, it should also be possible for the teaching and learning materials to be disseminated and amended, i.e. optimised, in the educational context as well. Based on the newly set up European School Cloud, the European Department for Educational Media and Materials provides a central platform, organises the management, quality standards, communication with all users and technical implementation. All European member states, all teachers and every European pupil have equal access to the platform and can be involved in the creation and dissemination of educational materials.

The European education community safeguards the quality of content by means of the openly visible process during material preparation and its further development, an assessment system and a parallel communications forum, in which all interested parties can discuss all the content. The frame of reference for all content is global in nature. Collectively, the European education community stands for the protection of democratic values and an equal pluralistic society.

### **3.3 The "learning areas" – multiperspective and interdisciplinary**

In terms of topic, the freely available and public materials are divided in accordance with the newly defined and interdisciplinary "learning areas". After the abolition of the curriculums, topics such as "migration", "World War 1" or "Pythagoras' theorem" are prepared in modular fashion, multiperspectively, interdisciplinary and in a skills-oriented way. Every European pupil makes a choice, in groups or individually, based on personal learning perspectives and will if required be looked after individually by teachers or within the framework of the education community by other pupils. The results of the individual and group work are included in materials prepared so far. Open online courses amongst other things will also be offered on the platform, in which European pupils can participate equally regardless of learning success, age, nationality and social status.

### **3.4 Uniform standards**

The necessity of uniform digital standards formulated and adopted by the European Parliament will be gradually implemented in the individual member states by the European Ministry of Education up until 2030. The objectives are the equipping of every European household with digital devices and/or mobile devices, the European School Cloud and Europe-wide access to the internet regardless of location.

The central platform of the European educational media and materials is based on a piece of open software which publishes materials in the form of open and uniform formats. The fundamental requirement for preparation and dissemination is the standardisation of the EU Copyright Law and the rights of use (keyword: "licenses").

The assessment system of "European Education 2030" is no longer based on grades but on assessment using "learning successes" by means of discussions and individual tasks. If required, the teachers provide assistance, information and an assessment of the respective individual status and guarantee social cooperation and exchange. In many cases the European pupils receive support in the group of pupils itself. At the end of the period at school is the universally valid and globally recognised *Abitur*.

Communication within the Common European Education Policy and in the European education community will be simplified by the use of the common lingua franca of English in the field of education.

#### **4. Concluding statement**

Education is being revolutionised. To make the vision of "European Education 2030 – open and free, integrative and sustainable" a reality and to approach it step by step – this must be the objective of the Common European Education Policy. We therefore request the European Parliament, the European Commission and the Council of the European Union to declare their strategic goal to be the restructuring of the education sector and the development of supranational instruments, to take part in the coming debates regarding the issue and to bring all participants around the table. The goal of "open and free, integrative and sustainable" education can only be achieved with the committed collaboration of everyone in the community.



## Part 2: Other Papers submitted under the Call

We are extremely happy that our call for vision papers generated such a high interest that we received more than 30 contributions full of interesting ideas. We wish we would have been able to select more than 7 papers for the awards, but places for the workshop were limited. Thanks to ALL authors for their inspiring ideas! We hope these papers will contribute to a lively debate and drive policy making in the area.

Here a brief summary of the visions we received and in the following the full versions of all remaining papers in alphabetical order.

According to [Daniel Bernsen](#) all elements of future school education are already there in germ: they will be flourishing in 2030.

[Ewa Danuta Bialek](#) believes that the future of Humanity lies in the proper vision of education which implements and restores communication with oneself (Self-education), and this will help to build healthy relationships with others (Health education) and the world, thus solving the same human and contemporary world problems.

[Giuliana Dettori](#) thinks that we will be able to take advantage of Open Education in school if we first learn to use well our most powerful resources: our minds. This can be achieved by fostering self-regulated learning from early school up to professional training.

[Fernando Escribano Martín](#) underlines that the future of education is here. We have the skills, we just have to learn and to decide to use them.

[Virginia Esteves](#) points out that although there are different methods and roles for education in 2030, these have the same aim: improving the future.

[Jüri Ginter and Mariann Kajak](#) want schools to become the centres of socializations for students and the hearts of the communities.

[Aleksandrs Gorbunovs](#) envisages an all-embracing school system and educational process digitalization, free choice of free open education e-resources in free collaborative e-environment will facilitate learners' critical thinking and reflection skills, enhance knowledge development, and improve learning outcomes.

[José Ramón Jiménez Gil](#) argues that only if Europe is seen as an inclusive school and Globalization as Cooperation will we be able to speak about Equity.

[Gisèle Legionnet-Klees](#) imagines that in the future teachers create the frame for the children to learn, drawing and contributing to the open education resources. General digital literacy and demanding school standards allow children to do significant contributions to the open resources.

[Emanuela Leto](#) believes that English complete each other in modern school education.

[Ronald Macintyre](#) wants us not to be so gloomy. He believes that once openness moves beyond the academy we will see the development of a more just society.

[Cheryl D. Miller](#) would like to build a pan-European gamified, online platform, supported by (female) mentors and role models, for engaging girls to carry out socially-oriented projects in their communities using Science, Technology, Engineering and Mathematics

[Antonio Monje Fernández y Miguel Ángel Pereira Baz](#) from CeDeC, the Spanish National Centre for Curricular Development with non-Privative Systems, think that by 2030 a new model of learning based on new methodologies supported by new technologies will emerge.

[Kirsten Panton](#) presents *Microsoft's* vision of the future, which is based on the belief that technology solutions ought to be as unique as the teachers and students in each classroom and we fundamentally disagree there is a one-size-fits-all technology solution.

[Giles Pepler](#) argues that the development of open apps offers a route towards unlocking the untapped potential of school education and realising the potential of Open Educational Resources.

[Gina Souto](#) thinks it is time to bring opportunities to visionary teachers to deliver an 'open education' to all students based on technology, enhance students' choice and meet or exceed learners' expectations

[James Stewart](#) wonders if Schooling in 2030 will still be a growth industry.

On behalf of the [ODS consortium, Christian M. Stracke, Nicolas Athanasiades, Ard Lazonder, Antonis Ramfos, Sofoklis A. Sotiriou and Lampros Stergioulas](#) emphasize that Open School Learning means engaging teachers, students, parents and policymakers to promote and realize more flexible and creative ways of schooling, through innovative scenarios, and sharing open educational practices and resources, using the unique approach for de-centralized and technology-enhanced communities championed by Open Discovery Space project.

[Andreea D. Suci](#) believes that in 2030 on-line courses are the best format for the secondary school education.

[Alek Tarkowski and Kamil Śliwowski](#) foresee that by 2030, public educational resources will be treated as a common good – just like natural energy resources. Even if the publishing business, as it currently exists, will not last until 2030 because of the disruptive effect of the OER model combined with the spread of cheap digital technologies, OERs will last. And as a common good, they will form the basis for a market for publications and other services based on free and open resources – the way there is a market for the collection and distribution of energy based on natural, renewable sources of power.

[Asimina Theofilatou](#) thinks that in 2030 Open Education uses established open-content networks such as Wikimedia to engage students, scientists, local communities and senior citizens in joint efforts to build and share knowledge for the solidarity-focused society of the future.

[Katerina Vigkou](#) idea is that University students could produce OER under the umbrella of service-learning and an online platform could be created for students and teachers to help them prepare their lessons – OER.

[Martin Wolpers, Maren Scheffel, Katja Niemann and Uwe Kirschenmann](#) want to enable teachers to simply create and use OERs in their respective educational scenarios.

[Paolo Zanieri and Patrizia Del Lungo](#) consider Open School Education 2030 as a new school between relationships and tools.



## Opening schools by mobile learning

Daniel Bernsen

*All elements of future school education are already there in germ: they will be flourishing in 2030.*

School education is a very slow changing and sedate system. Changes take long to develop and to implement. That is why one can see already the future taking a look at what is happening right now in some schools but what will spread within the next couple of years. A child born in 2013 will be 17 years old in 2030 – what will school education look like for him or her?

As mobile devices get more powerful and less expensive, they are the key to change education. In 2030, after having banned mobile phones for some years, all European schools have adopted a BYOD policy.<sup>25</sup> Before coming to school, students and teachers check the latest news on their mobile device. Every school has its own app<sup>26</sup> informing the members of the community about cover lessons, exams, the menu at the cafeteria and so on. The members use the app also for communication with the whole community, in groups or in private.

As mobile devices enable students to learn and work wherever they want to. Actually it would not be necessary to meet every day for six hours or longer in one place to learn. Nevertheless authorities stick to students' presence in school. In 2030, some schools start to work with an automatic login when students arriving in school.<sup>27</sup> The main idea was that administration is informed directly and can react by calling them or their parents to fight absenteeism. The question of how much control is admissible is an on-going debate for years. The project is abandoned shortly after its introduction as a large number of students handed over a second mobile devices to their friends to logged in without being in school.

The use of mobile devices opens academic learning beyond classrooms and libraries. They combine different tools enabling the discovery, analyse and evaluation of everyone's living and working environment in respect of natural, physical, chemical, political, economical, architectural, social and historical conditions and their interdependence.<sup>28</sup> The knowledge of the world is now accessible to everyone at any time and in any place, by this creating more equality and chances for students in remote area and from less favoured backgrounds. The artificial barriers between “schools” and “the world” are dismantled: Schools open up to the outside world, and by their tools, in a sort of a paradox, mobile devices facilitate students' and teachers' cooperation as well as individualisation of learning processes.

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25 BYOD = Bring your own devices. See also UNESCO Policy guidelines for mobile learning: <http://unesdoc.unesco.org/images/0021/002196/219641e.pdf>

26 At the moment there are several commercial and non-commercial initiatives, like e.g. <http://schoolappkit.appspot.com/start>, <http://www.activeschoolapps.com.au/> or <http://www1.wdr.de/themen/digital/schulapp100.html>.

27 Just like many people use foursquare.com for fun today.

28 <http://en.wikipedia.org/wiki/M-learning>.

There are no more classes as of fixed groups of assumed homogeneous students. Instead, they work freely in learning spaces instead of classrooms. These learning spaces are not rooms for one specific group of students but diversely equipped learning environments like e.g. a chemistry lab, a media centre or a plenary hall. Subjects and curricula are replaced by learning areas, tasks and skills in form of inquiry- and design-based projects like building a wooden ecological house or creating a computer game.<sup>29</sup> All these learning areas are conceived in a European as well as in a global perspective: Students do not learn any longer about famous scientists and poets of one nation but about their relatedness to the development of civilisation.<sup>30</sup>

There are several learning fields to cover per year reuniting some of the former subjects.<sup>31</sup> Students are free to choose the way they want to learn and work, individually or in teams, in the school lab or in massive open online courses.<sup>32</sup> They are also free to choose the order in which they tackle the required areas. Every learning field completes with a learning product like e.g. an essay, a video, a learning diary, an online game and other. There is a set of standard products which are required like one video per year by each students or a certain number of essays. Although students are free to combine learning area and output in the way it seems appropriate to them.

The role of teachers has changed completely, whereas they are still important: Teachers are connected with colleagues from other schools from all over the world to exchange experiences, to collaborate, to share materials and to organise exchanges. Being experts in their scientific domain(s) and even more in pedagogics, they help, advise and guide students if necessary. Fundamental changes in teacher-training in the precedent years made this change possible. Teachers are also still responsible for the certification of students' work following established European standards.

Most of the time students spend collaborating and discussing with other students from all over Europe and the rest of the world. ICT and social networks will be self-evident tools not only to learn and use foreign languages but also to discover and discuss different local, regional and national perspectives on historical, social, economic and political matters.<sup>33</sup>

Every European student learns at least two foreign languages. Of course, every student by using his own device is learning languages by video-conferences from native speakers, students and teachers as well.<sup>34</sup> In addition, there will be individual exchanges of a few months abroad.<sup>35</sup>

On this base, it is obvious that textbooks and other learning materials in 2030 are different from what we know by now. Learning happens much more in direct or ICT based peer-to-peer interaction. There are no more single text- and workbooks for each subject but a network of diverse teaching and learning materials that can be combined individually.<sup>36</sup> All materials,

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29 See e.g. [www.edutopia.org/](http://www.edutopia.org/).

30 Classroom4.eu – Towards an interactive textbook on European civilisation: [www.classroom4wiki.eu](http://www.classroom4wiki.eu)

31 Ute Erdsiek-Rave/Marei John-Ohnesorg (ed.): *Bildungskanon heute*, Berlin 2012, online: <http://library.fes.de/pdf-files/studienfoerderung/08990.pdf>

32 Launch of first pan-European university MOOCs: [http://europa.eu/rapid/press-release\\_IP-13-349\\_en.htm](http://europa.eu/rapid/press-release_IP-13-349_en.htm)

33 eTwinning.net or classroom4.eu.

34 <http://www.glovico.org>.

35 Erasmus for all: [http://ec.europa.eu/education/erasmus-for-all/index\\_en.htm](http://ec.europa.eu/education/erasmus-for-all/index_en.htm)

36 Martin Ebner/Sandra Schön: *Band 4. Die Zukunft von Lern- und Lehrmaterialien: Entwicklungen, Initiativen, Vorhersagen*, 2012, online: <http://13t.eu/oer/>

texts, photos, videos<sup>37</sup>, exercises<sup>38</sup> and so on are collected and connected via the mobile device of the student and the web. These materials are commercial as well as Open Educational Resources - chosen upon their quality. As they are digital and licensed under Creative Commons, they can be edited, updated, remixed, shared and republished.<sup>39</sup> Some of them are produced by students.<sup>40</sup> Writing for and teaching to other students is one of the main characteristics of education in 2030 as several forms of peer education have developed over the last decades.<sup>41</sup>

**Conclusion:** In 2030, schools will have opened in many ways. By the use of mobile devices many of the organisational, technical, curricular, traditional or financial obstructions preventing students from learning what is important to them and in the way they want to learn will be surmounted.

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37 Learning by videos is getting more and more important. A growing number of free accessible videos are produced by teachers and professor and put online. Every student can already by now watch lectures from Oxford, Cambridge, Stanford or Paris. See e.g. <http://flippedclassroom.org/> or <https://www.khanacademy.org/>.

38 For example <http://learningapps.org/>

39 <http://creativecommons.org/>.

40 An interactive textbook on European civilisation and culture written by students: <http://elearningeuropa.info/en/article/Classroom4.eu---An-interactive-textbook-for-schools-on-European-civilisation-and-culture>

41 <http://peeragogy.org/> or <http://blog.peerinstruction.net/>.



**My Vision for School Education:  
As "Education for the Future" of Man and the World**

Ewa Danuta Bialek

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*The future of Humanity lies in the proper vision of education which implements and restores communication with oneself (Self-education), and this will help to build healthy relationships with others (Health education) and the world, thus solving the same human and contemporary world problems.*

*We cannot teach people anything. We can only help them discover something about themselves.*  
Galileo Galilei

*Teach the joy of beauty, wisdom, happiness. Teach the bliss of love.*  
Dr Roberto Assagioli, Founder of Psychosynthesis

*Do not be afraid of the wind in your face. And remember - a kite rises against the wind rather than with the wind*  
Vivian King Ph.D. Psychosynthesisist, Founder of Inner Theatre

## **Introduction**

Without vision, both education and the individual slowly die. With vision man flourishes and education helps to achieve and fulfill his purpose in life to help others.

Education in the twenty-first century meets major challenges. It needs to be "on time" and correspond to the time in which we live, as well as being ahead of time, with a view toward the future and vision: *"Where are we going? What do we want to achieve? What kind of people are we preparing? What kind of future? In what sort of world?"*

Educating for the future means bringing out the essence of man and the world. It has developed man's meaning of existence and his place in the world, his spiritual dimension and the importance of each one for the lives of others. Education concerns man himself, his relations and the world - i.e. life.

## **A new educational subject – self-education in connection with new scientific discoveries**

Self-education is an important subject at school at all stages of learning; the foundation for promoting health and development from early age, a preparation for lifelong education (described in the first part), it eliminates many of the problems in the sphere of physical, mental and social health and development.

Self-education (or learning about oneself) works on a number of levels of self-knowledge: the senses, emotions, imagination, experience, intuition, will, and making the right choices. It leads also to drawing out the sources of man's identity (*educare*), his humanity, his spiritual being. Self-education has not only to do with recognizing one's senses, but also learning "body language", discovering experiences and emotions coming from that. These are signs of physical presence and feelings in the body, both positive and unpleasant (pain, temperature, suction, itching, chills, sensations in the body and its various organs) in order to search for answers to the existential questions: *what does this mean to me? What's going on in me? What do I do with this? How do I respond?*

It is a challenge for modern pedagogy to integrate the various dimensions of the human being, piecing them together (including the physical, mental, emotional and spiritual dimensions). It is a challenge for man to understand himself and his function in life as a whole, so as not to increase the amount of social pathology. This kind of education will find ways to deal with health problems, including minor problems like abdominal pain and headache (common in children) or severe dysfunctions leading to self-destructive reactions (e.g. anorexia, bulimia, suicide) or harming others (e.g. pedophilia). In a broader perspective such education will help to understand how to find peace, starting with oneself, and not fighting for peace in the world.

In fact, educating children entails exercising all the functions of human beings, exploring the possibilities and talents, supporting what is present in a person and necessary for strengthening him for sustainable development. In education at various levels of training we have to teach and learn to be, to know, to act, and, above all, to live in the community. These are the four pillars of modern education (J. Delors). With their support, we are able to live in harmony with each other, as well as to create balanced family relationships, at school, at work, in the community and throughout the Earth.

Dr. C. Pert, an American professor of physiology and biophysics, formulated in the mid 90's of the twentieth century, the concept of "molecules of emotion" that carry information from the immune system to the brain and back to the endocrine and digestive system, etc. This makes us aware of what we feel when we are hungry, angry, frustrated, stressed, happy and full of energy. These signals can also be the basis for the process of healing by the action of the mind on the body, explaining how stress weakens the immune system and / or how we can beat cancer with a positive attitude. Pert also popularized the concept of mind / body, as scientists have discovered that we have a "second brain - the belly" that gathers tension and stress, and one can also hear the "sounds of a healthy body".

All the messages from our body tell us about internal equilibrium or imbalance. If we respond to them by only using drugs and not freeing accumulated emotions, we become distressed, fearful, anxious. In our civilization this is known today as self-destruction, autoimmune aggression - the consequence of uncontrolled metabolic changes.

Modern science, especially neurology and related sciences (neuroscience, psychoneuroimmunology) systematically discovers that we are the creators of the reality in which we live. We create it - not only our thoughts, but also emotions, ideas, and will. Experiential knowledge becomes so basic, like a process of self-reflection; it should be taught in school, to help to experience the sense of being not only an integrated unit, but an integral part of the world and its mystery, discovering what is transcendental, universal. This is not only important in education about facts and things, but for the way to knowledge and understanding of oneself and the world.



Neurobiology also shows that the emotional response comes first, before thinking and awareness of events. We can control what we do with emotions when they appear (sometimes it's too late), but we cannot control them before they occur. We know, however, that the body's self-regulating metabolism, sensory-motor experience and basic emotions are the basis of the experience of self-awareness.

Knowledge of physiology, the mutual interdependence of the body on all levels (physical, emotional, intellectual, spiritual) now becomes an essential factor in educational activities and does not relieve teachers from the responsibility for their actions, because they can harm children's health and young people's lives, as well as the state of the world. Unconscious actions have an impact on the health and quality of life for the child over time, all the way into adulthood (words can hurt and words can heal)

Teaching requires the inclusion of a reality that is "out of the students or the teacher," but they are also part of this reality. This allows us to see the world as if from inside, while inside, with the ability to "feel it", to "feel to it." If we are also aware of the fact that knowledge requires a relationship between who knows and the known, pupils and students will be involved in a personal relationship with the world (interactions).

Seeing the whole person allows us as teachers to see our pupils as more than an instrument of knowledge. We can find in each of them their own nature, the sum of which is greater than one, the I (self), ready for the relationship. This *relational readiness* (spiritual readiness) is not just logic but also the inner understanding of others, empathy, finding higher values derived from love, identity, its roots being in trust and respect for integrity, derived from self-respect. In this way, a *relational individual consciousness appears* (D. Hay).

In the proposed model of education it is necessary to rebuild the relationship with individuals, others and the world. In the modern world, they are at the stage of decay. The need for relationships with others results from the discovery of the atavistic, deep inherent bond with nature, animate and inanimate, participation in the whole world and being a part of it's uniqueness. These links trigger, hidden within man, unarticulated yet subtle signals of communication that are pushing us to build relationships, to connect and be connected to one's own transformation and the transformation of the environment.

## **Conclusions**

The proposed system of education builds concentric circles from the individual to the outside. At the same time it creates these circles inwards, from the surface to the deep levels - to the center of oneself, building a unified sense of identity (personal self).

Arranging levels in oneself brings them out. It acts as a field of resonance: the more you discover the inside, the more you resonate to the outside. It is the ongoing science and art of exploring the potential in oneself, the gifts and talents of individual persons, their life and mission / purpose, the meaning of their life.

For this reason, the proposed vision is unique, because through applying a similar methodology to every human being from the beginning of his education, each person discovers aspects of development and uniqueness. This uniqueness of the person will allow for the implementation of himself fully in life.

The proposed system introduces the teaching methods of working with intuition, emotions, organized thinking (intellect) in such a way as to make them equivalent of mental functions, controlled from inside (stabilized personal center). This personal center allows everyone to make the right choices through the use of will (volitional acts).



The proposed system thus allows for finding man's center (personal center). He can organize himself from the inside out, embedding everyday experiences, integrating them to find their meaning. This approach allows everybody to build, (exploring) constituencies created by one's individual experiences (like rings in a tree). A consistent system of exercises (lessons, workshops) allows each pupil to systematically organize himself, forming circles around his personal center (like the rings in a tree), including daily experiences and describing them in the special Journal of Life (travel). This constant sorting becomes a path leading from the integration of everyday experiences into a coherent whole, to explore the deeper layers of oneself (being oneself), discovering the human core, identity.

The discovery of the substance (identity- personal center) begins to create internal order (described by D. Bohm as *an implicit order*), and this automatically triggers access to the source of being, to learn from it, resonate with it. It's like an echo formation. Giving voice creates an echo, which propagates the wave around; so getting to the essence of each individual triggers echoes, manifested in the outside world.

*The role of the teacher* is to be a guide on the way to the inner world, showing the tools and capabilities of internal order, consolidating everyday experiences, exploring individual potential and one's own way.

The teacher's task is to keep showing how to reach harmony at all levels of the person, discovering these levels, reaching the center of the personal self and its tool – the will. The way to surprise modes - like a Swiss watch, where the stabilization of one of the modes in the right position makes order that everything may come back into harmony and resonance.

*The task of the pupil* is to follow "a master", who leads the way, focusing on everyday organization, to do "homework" by pursuing the Journal and reporting problems. This is done both individually and in a group, a team of pupils. This team, sharing their individual problems and examples, triggers the need for a single person to follow the objective of finding inner harmony and meaning in his life by integrating his own experiences.

School becomes life – the *school of life*, participation in the life of individuals and society, transferring their talents and gifts to social activities. By helping to increase individual pupils, it becomes a mirror for viewing social problems to echo those needs, helping each student find the way to use his talents and gifts to serve others. Thus, school lessons are complements of each student, while life around, following individual and group development, translating self-development (self-knowledge) and living the lives of others and to participate in it, in the service of others.

School becomes a science and an art of self-learning, participation, self-knowledge, the art of living in a group, in society and in the world.

The school is also becoming a health promoting school, starting from inner equilibrium, (homeostasis on many levels, not only on the physical level) and this allows everybody to stay healthy as individuals, the family, the community and the world.

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## Improving the use of our most powerful resources – towards a culture of self-regulated learning

Giuliana Dettori

*We will be able to take advantage of Open Education in school if we first learn to use well our most powerful resources: our minds. This can be achieved by fostering self-regulated learning from early school up to professional training.*

2030 - We all imagine open education fully blooming, after a few decades of development: plenty of resources and practices of the most diverse kinds at disposal, apt to put the learners at the centre of their learning process and provide them possibilities to flexibly delve from, and combine, formal offers and informal opportunities, based on their wishes, needs and previous experiences.

Good. But will learners actually be able to take advantage of such opportunities? Will teachers be able to exploit the available open resources to enrich their own classroom activities, yet providing space for their students' individual learning goals? Will open resources be developed in such a way to actually support students and teachers' activities with them? If students, teachers and open resources will remain as they are in 2013, the answer to these questions will likely be far from positive, no matter how numerous and technologically powerful open resources will be available: we cannot take for granted that students are instinctively able to manage their own learning, nor that teachers can easily manage to integrate open education with the complexity of classroom management, nor that (open) educational resources of any kind always support students and teachers in those complex tasks.

A solution to this problem is provided by self-regulated learning. This field of study has been increasingly active in the past couple of decades, giving rise to several approaches (see e.g. Boekaerts, Pintrich, Zeidner, 2000; Zimmerman 2001), and a large amount of literature on all the various aspects involved, as well as on the possible support to its practice and improvement provided by technology-enhanced learning environments of any kinds. No matter how self-regulation is defined by the various authors, there is general agreement that it involves strategic action, motivation and awareness of one's own learning goals, needs, thoughts and achievements, and that its final aim is to help learners make a better use of their (mental) resources.

The literature shows that learners' acquisition of self-regulation competence is not automatic nor does it take place in a short time, but requires suitable teaching and practice (Boekaerts, 1997). This competence is partially dependent on the learning context, which means that it cannot be fostered within a single course but should be practiced in a variety of contexts and in relation to different subjects and activities. The good news is that self-regulation, and in particular its self-reflection/self-awareness component, which is usually called metacognition, is accessible to children from early school years, including those with learning difficulties (Larkin, 2010) and can profitably be included in classroom instruction (Schunk and Zimmerman, 1998). Technological resources of any kind can contribute to foster the practice

and development of self-regulation during learning activities if they facilitate strategic action, self-reflection, self-evaluation, monitoring of the activity against the expected achievements, motivation support (Dettori and Persico, 2011). Self-regulation is necessary not only to learn well in school but also to successfully deal with any profession; teachers, in particular, need it to cope with the variety of situations they face in the classroom (Paris and Winograd, 2001) and to adjust to curricular revisions and the fast evolution of technological and cultural tools at disposal.

Hence, in my vision of a flourishing open education in 2030 a central place is given to self-regulated learning, as a necessary means to put learners and teachers in condition to really take advantage of open education's opportunities and fulfil their goals. This entails giving explicit attention to the practice of self-regulation in any educational offer, from early ages up to professional training, and taking care that open resources be apt to support its practice. This vision is not outdated or trivial as we could be tempted to think: despite the very positive outcomes presented by the increasingly big number of studies in this field, self-regulation is still mostly disregarded in school learning; its inclusion in school education entails a deep revision of curricula and teaching practices, which cannot be left to the good will and creativity of single teachers but should involve educators and policy makers. Its adoption, on the other hand, appears crucial to give concreteness to the idea of "learners responsible for their own learning" and to prepare a widespread and profitable exploitation of open education by helping us to use at best our most powerful resources - our minds.

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## If it is so good.... why not?

Fernando Escribano Martín

*The future of education is here. We have the skills, we just have to learn and to decide to use them.*

This is the first thing I think when I do it about the Open Educational Resources. Where is the problem? Resources, tools, teachers...? Working with Open Educational Resources (OERs) is really a possibility today? A lot of questions, which we are training to answer in this paper.

This paper is a reflection, there are a lot of questions, is a search for answers without any solution... really. I imagine a futur that is a present, but from this present with so many questions, we can build this futur that we can have tomorrow.

### My treasure



Sometimes, the relationship of any teachers with their classes remember me that: a treasure that only they have the key and slowly dosed.

Others teachers look for this treasure and, in the way, hide all, no ones know what they do, without knowing the reason...



...but I still don't understand what benefice can have from this attitude.

### **What do we hide?**

Sometimes it looks like our classes should be a treasure to hide ourselves, and that only sometimes we show in the classroom.

### **Why?**

Is it fear of being seen?

Afraid to students know more than we about what we are talking about?

Afraid to be judged?

Fear of not knowing?

Fear of what will happen in class?

Open Educational Resources could be an alternative model, a cooperative mode to work, including teachers, students, in the classroom, at home...

If Open Educational Resources are so good... why don't we use them?

### **OPEN choices (OERs)**

A definition: The [Organization for Economic Co-operation and Development](#) (OECD) defines OER as: "digitised materials offered freely and openly for educators, students, and self-learners to use and reuse for teaching, learning, and research. OER includes learning content, software tools to develop, use, and distribute content, and implementation resources such as open licences". [["Giving Knowledge for Free: THE EMERGENCE OF OPEN EDUCATIONAL RESOURCES"](#)]. *Center for Educational Research and Innovation*. Retrieved 28 March 2013. ]

Advantages, possibilities:

- Infinite sources. Or not. The teacher have to do a good search and educate student criterion. At the same time, as part of the same job.
- Work in line with many other fellow.
- Build and modify (for others to do the same) in terms of our own needs, the work of other to similar classes.
- Making available (and therefore likely to improve) one's work.
- Share with students labor, materials and tools to get them to build their own.
- To network and cooperatively.

### **What are we dreaming about?**

More questions:

- What are we looking for in education?
- What students know what?
- What do we want them to learn? Contents, skills, basic skills, a curriculum...
- It is so good?
- What to do to change? Convincing? Of what?

### **What we have to deal with?**

- What is the education new paradigm?
- What is the teachers new role?
- Are we willing to change? Some do not.

### **What weapons do we have? What is the key of the chest?**

- Internationalization
- To take the opportunities
- To learn to share
- Learn to trust others (teachers and students)

And for this we need:

- Hope, faith
- Critical spirit
- Analytical skill
- Criterion, view!

And then use what the rest do, create own materials (to the classroom and in the classroom) and work, and as little as possible with lectures.

### **What is the future? And where is it?**

The future is here, we just have to take it, to use it. When you asked me about how I imagine the futur I thought about a film: Minority reports...:



But, thinking more, this is possible today. We have tablets from which we control the board. In Internet there is a lot of resources we can use, it is possible to have a computer (or a tablet) by student...

We are developing the Open Educational Resources. I understand is a change in conception, educational philosophy, of paradigm. The role of the teacher changes, but is even more necessary. Is more immediate, versatil and involves a knowledge of new (really new?) technologies. But make you closer to the student reality, and from there you can redirect to education pure and simple.

The only thing that change is the media. The rest: the role of the teacher and students, the classroom, the possibilities, the sensations, the resources, class preparation, how to work in class and at home.... TOO CHANGE, but is better.

Like in the *Gattopardo*: Everything has to change so that nothing changes.





## Improving future for next generations

Virgínia Esteves

*Different methods and roles for education in 2030 – Same aim: improving the future!*

Education is something special. It is one of the most important issues to be considered to develop a country and to improve the future for the next generations. Education can't be seen as teachers and pupils but also parents, communities, different technicians and many other stakeholders. Another thing that can't be forgotten is the education resources. There is no education without resources. ICT gives the opportunity to have a great library, where the information is always available. Open Educational Resources are a great help to achieve skills.

To be effective education demands the enrolment of all the parts involved in the learning activities. Peer learning and interaction are essential concerning education. Peers learn with each other when they debate, discuss, share and accept the other opinions, points of view and set up their conclusions. The OER are useful to learn but the communication is imperative. Teachers have an important role to guide the apprenticeship and to promote the debates and the discussions among the peers. Peers must improve their communicative skills while they share knowledge. This type of learning gives the peers different kinds of skills, they learn together with the formal learning and many informal learning issues such as respecting the other opinions, sharing points of view, practicing are also included. Learners can be really motivated to learn using OER because they can go on learning according to their speed. Teachers have always an important role in education. They should teach learners how to use the OER and they should give the scientific support according to the content they are learning.

The OER are allies to the ones who are keen on learning. Together with cooperation, collaboration and team work the OER can take learners to the goal they want to achieve.

Learners will go to school and they would be more autonomous and responsible to draw their future. Lifelong learning will be possible by using OER. Learners will develop projects with their peers and teacher will share their methods and knowledge with their colleagues around the world.

Education in 2030 will have a new concept. There will be learners and teachers but their roles will be different from today. The OER and practices will be there and the opportunities will grow for the ones who will take advance on what they learn. People will have equal opportunity to improve and to learn about they want to.

The OER are the future. The future of education, the future of new generations will meet for sure the OER.



## **School as a centre of socialization – a challenge for education policy and law**

Jüri Ginter and Mariann Kajak  
*University of Tartu, Estonia*

*Schools should become the centres of socializations for students and the hearts of the communities.*

### **Socialization as the central process in education**

Socialization has been and is one of the central processes in education. The difference of this term in different times and countries lays mainly in the role and place of the student in education process. According to one paradigm a student is an object in service of the aims and needs of the society, another paradigm considers student as an active citizen.

Schools were founded to prepare young people for different roles – factory schools to prepare workers and private schools for future members of parliament. Schools choose fitting pupils and shape them according to the curriculum. Schools try to find similar students to teach them in the same way. Such approach still appears in many countries (Germany and others) even though the country has actually adopted a new, 21st century paradigm of socialization. In the system where children have to choose between academic and practical education in a very early stage of their studies (before 9th grade) the risk of labelling is vivid and may lead to the same effect which schooling according to the old paradigm had – shaping pupils for a certain role not giving them the belief of variety of chances in life. Such situation is criticized by humanists and socialization is often found to hinder the development of individuals. Therefore this kind of choices in education system must be deliberated very carefully and attention should be paid on measures for avoiding the kind of negative consequences described above.

According to the new paradigm socialization is a reciprocal process, where a person influences his environment and adapts in the same time. Personal growth is related with the development of the community and society. Schools and education are meant to support pupils to become active citizens, self-conscious individuals who have an opportunity and ability to make conscious choices in life. The difference between people and the individuality of each person are considered as beneficial and necessary entities which enable people to supplement each other and add value to the society. This approach can be taught in a mixed group.

Because of this shift of paradigms we can not use best practices and research results from the countries where previous paradigm prevails as schools, environment and objectives are different. Otherwise we will end up in a situation where we use 20th century teaching and leading methods in the 21st century school. Measures have to taken in politics and law of education to improve the situation.

### **Changes in society as challenges to schools**

Society has changed rapidly. Previous centres of socialization like family, church and work have lost their role. Many families have only one child and a single parent and they live

separately from their relatives. Many people are not related with church. The work has remained only for grownups (but not for all of them) and not all the companies pay attention to the working culture and social relations of workers and many jobs and working environments do not support or even not allow socialization. Children do not go to work and so they can not socialize at work any more. The proportion of immigrants is approaching critical limits. Children spend most of their time at school. They go to school to meet their friends. School may be “a melting-pot” of different groups and a tool for facilitating integration in society. When people participate in joint activities, they trust each other more and gain shared understanding, joint meaning and values. Development of transport, media and internet has made us global citizens. It means that we have to cooperate locally to be competitive in the world (glocalization). Networking can refrain nationalism and racism as antithesis to globalization and individualism (Carnoy, 2005).

Most of the information is available on the Internet and children are very advanced users of ICT. The richness of the information available on the Internet and children’s ability to find it contain a chance and challenge to educators. On the one hand it is possible to use these to refocus the school education from teaching the facts as such on the ways of finding them. The ICT skills of pupils give educators a chance to use these to develop and improve students’ creativity, problem solving and communication skills and cooperation. On the other hand not all the information available on the Internet or elsewhere is reliable. Alongside with previously mentioned skills and abilities attention should be paid on critical thinking of a student. In order to manage well and be an active member of today’s information society it is an essential ability. That means that teachers and other educators must improve their skills in Internet and information management as well.

New knowledge accrues every day and it is impossible and useless to teach everything beforehand. By refocusing the content of education from fact teaching and learning on developing skills and abilities needed for a global citizen of 21st century and directing attention on personal development of a student, also the grading has to change. It means that the role of grading based on controlling the knowing of facts should decrease as it hinders courage and creativity and more attention has to be paid to formative assessment.

If teachers and parents do not understand these changes and insist pupils to cram facts, children will begin to hate the school and start to socialize on streets and in the internet outside the control and support of adults. When schools do not settle in the changed environment, education may cause social problems. Children learn to demand more (they know, what they need and are not satisfied with worse conditions or lower salary) but are not able to fulfil a job where they can earn enough money.

In order to make the shift real, parents have to become a part of it. At the moment the problem is that parents expect from the school what the school cannot do and do not expect what the school really has to do. This is based on their own experience from the earlier period.

„Most of what the general public understands about school comes from the lens of their own experience. We can’t settle for having a „good enough“ system. The adage that, „it was good enough for me, it’s good enough for them“ will only cement outdated thinking of what teaching and learning can look like.“ (Wessling, 2012). So the challenge here is about making parents, and that means actually the whole society, aware of what should education nowadays provide for children. The other challenge concerning parents is dealing with the ones who do not fulfil their parental obligations. Sometimes schools fail to notice or to provide appropriate help and support to the students who do not have supporting homes and families.

These tendencies demand an education which is in accordance with the situation, the needs of people in it and the needs of society. The new paradigm enables to handle these challenges

and to change obstacles into resources. Disintegration of the society may be the basis for the development on the new stage. All these challenges must be dealt with not only on school level but on political and legal as well.

### **Challenges to education law and policy**

Education policy and law may not remain too much back (for instance the proportion of tertiary graduates in management positions has declined in the majority of EU Member States (Key Data, 2012, p.180), what shows, that schools have lost the connection with the society) and hinder the development or outrun the development of the society as a whole.

Some scientific research about schools' quality may hinder the development of the society by taking into account only academic achievement (the objective of the past paradigm) and not the success in life or other important qualitative figures of education and school. Parents and politicians may get a false picture of the situation of education and postpone necessary changes which would be needed to provide children with a good education. The exam-result based listing of schools is tightly related to the grading system itself. As long as students and parents see that the future opportunities of the child somehow depend on exam results, the lists gain attention and are composed because final exam grades are a good and objective criteria for it. The solving of the problem and changing the system therefore is a question of political and legal level. One of the options thereto is making the final exams optional like in Finland – the state supports studying but the students decide when and which exams they take. It would be a part of the shift of responsibilities supporting self-control and self-consciousness of students.

It has to be understood that people are not equal but they are equitable (PISA, 2010). “Equity in education means that personal or social circumstances such as gender, ethnic origin or family background, are not obstacles to achieving educational potential (fairness) and that all individuals reach at least a basic minimum level of skills (inclusion)” (OECD, 2012). Education policy and law should take into consideration, that children are different with different needs, interests and abilities. Equal education is unfair and increases contradictions between people. It is state's responsibility to ensure equal opportunities for gaining good education to all students.

Many countries have already changed their official education policy. Unfortunately the changes appear only on paper so far. The problem here is not only the fact that practical changes take more time and need some settlement. One could say that the changes cannot come into real so far as the governments' approach becomes comprehensive.

Creating and using exam-result lists to evaluate schools' quality will not stop before final exams end to be the main way for evaluating and measuring students' success in school. So will the equity principle not come into actual effect before the teachers' education provides teachers with values, knowledge and skills needed for implementing it, the school management supports the concept of common values and student as the most important subject in education process, the socio-economic circumstances and risks are dealt with effectively. So far there has been acknowledgment of a need for change and the key principles and values of the reform. Some practical steps have been taken as well but the whole process has been hectic and lacking a systematic approach. (OECD, 2011).

School is not merely meant for preparing pupils for examinations. Modern school should be the centre of socialization as the school is an integral part of the community and local life and at some points it even plays a central role in (cultural) development of the community. “Higher education institutions are not only sites of community formation but, as in the past, also continue to act as centers of cultural leadership.” (Carnoy, 2005). Learning maths, languages and other subjects should support socialization with corresponding environment,

school culture and shared responsibility and cooperation between teachers, pupils and their parents (Ginter, 2013).

If both levels of socialization – the inside level (learning process, school culture, leadership of the school) and outside level (school as a part of the community) – meet the requirements of modern society, the socialization is real. The community supports the school and the school supports the community. It is possible when school has a school district. Teachers and pupils participate in community activities and school is open for the community. There are already schools which involve parents and community by teaching parents some issues related to the development of the society and science, e. g environment protection. This is done through teaching the children. That means that the curriculum is not oriented merely to the students and the output is not only the knowledge of the students but also the development of the community. The other way of involvement is actual and direct cooperation between teachers and parents. In many schools it is already successfully implemented by having parents as mentors or assistant teachers for pupils.

To make these examples common and bring schools on the same level in that sense, thereby guaranteeing students the equal opportunities in education, some political and legal steps have to be taken for involving parents and community: who get salary from the school, who participate in staff meetings, etc.

To support integrated comprehensive education and the role of socialization in it finding a common nominator for all people who play an active and important role in education of the child could be very helpful. Separating teachers and supporting personnel (social pedagogues and others) separates teaching subjects like mother tongue or maths and socialization (teaching students). Common nominator together with other measures could be one step which takes the education closer to the above mentioned objectives.

We held above that school is an integral part of the community, it is therefore important to think about the territorial-administrative system together with the school reform. For example school districts (in US and in other countries) have less opportunities to support network of socialization than local municipalities which deal with social affairs, medicine, sports, culture, vocational education etc, like in Finland where there is only one level of local government.

It is important to find a new balance between competition and cooperation. Competition between schools for better students does not give good results (PISA, 2010). “Providing full parental school choice can result in segregating students by ability, socio economic background and generate greater inequities across education systems” (OECD, 2012). “Policies need to ensure that disadvantaged schools prioritise their links with parents and communities and improve their communication strategies to align school and parental efforts. The more effective strategies... encourage individuals from the same communities to mentor students. Building links with the communities around schools, both business and social stakeholders, can also strengthen schools and their students.” (OECD, 2012). Many states already have strategies to support weaker schools and students and through this weaker communities.

Another issue concerning socialization and related students’ abilities, values and skills development is home schooling. According to the law valid at the moment, a parent’s wish and application are sufficient grounds for putting a student on home schooling. As many abilities and skills, including self-consciousness and self-control, can be effectively developed in group, the regulation and possible restrictions on home schooling should be deliberated in order to ensure home schooled student’s proper education and development.

Despite tight relations between schools and the community and the dependence of school from legal and political system and decisions, the success and failure starts from leading of the school. Paradigm shift presumes the shift from authoritarian management to participative leadership. This means new role models, standards and by-laws for headmasters and schools.

“There is a groundswell favouring more participative and meaningful organisational environments”. (Woods, 2012, p 15). Parents and students should be involved and participate in the management of schools. Their competence should not be limited to only choosing a school without any possibilities to influence its development and participate in decision making later on. The other danger is to add new responsibilities on principals, social workers or teachers which they are not ready to carry out without cooperation and changes in labour distribution. Some principals, social workers and teachers may be supermen, but we cannot expect it from all and build up a system based on their experience. Instead of finding “supermen” we have to improve teacher education in universities, courses for headmasters and teachers, support measures and overcome the barriers between theory and practice.

Decentralization by delegating more responsibilities on school level – principal and teachers – may be a part of supporting socialization and new paradigm approach. It would be a shift of responsibility from a state to local and professional level as above described examination change. This is one of the main principles in Finland’s education system. According to this kind of example decentralization could be a solution as a shift from a rule driven to a results-driven system with “value-added schooling, benchmarking and finding best practice (Marsh, 2000, p. 128). But it is crucial not to use this practice without a good preparation and in system with other supporting measures. For instance the ongoing reform in Estonia may lead to over-decentralization and rather undermine the improvement and the goals of the system reform. Moderate centralization may be needed and in early stages of decentralization even stronger control could be appropriate. In both situations there is a danger to move to the other extreme.

The changes in education law may go in three directions: changes in court practice, changes in national legislation (first abolish previous restrictions necessary for the previous paradigm, then rule new arrangement) and in international policy and legislation (EU, European Council, UNESCO, UN). On all the levels when centralizing or decentralizing the risk described above has to be taken into account.

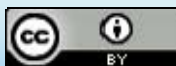
## **Conclusion**

Teachers as mentors support pupils to build up their own world, based on their identity and values. It means that all teachers should also have their own holistic picture of the world and they should understand their role in the world.

“... we have the opportunity to consciously shape educational policy – at school, local and national levels – by understanding and growing the future in the most fertile ground we can find” (Woods, 2011, p 6-7).

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## All-Embracing Digitalization or 10 Things to be Done in School Education till 2030

Aleksandrs Gorbunovs

*All-embracing school system end educational process digitalization, free choice of free open education e-resources in free collaborative e-environment will facilitate learners' critical thinking and reflection skills, enhance knowledge development, and improve learning outcomes.*

School education in 2030 might be imagined as the scope of aggregate best teaching practices, solutions, policy documents, and technology implementations which would enable prospective changes in this field. Suitable usage of free open education e-resources in free collaborative e-environment to facilitate learners' critical thinking and reflection skills, enhance knowledge development, and improve learning outcomes, ought to be considered as a great possibility to achieve new qualitative levels in the field of school education. To gain these goals, we ought to discuss some issues to be done in school education till 2030; thus:

(1) An assertion, that “more schools” – means “better learning outcomes and quality of education”, is incorrect. Instead, the quality should be placed ahead the quantity:

- Definition of clear goals to be reached by K-12 educational organisations;
- Establishing uniform standards regarding educational goals to be achieved by schools;
- Motivation of teachers professional growth;
- Material motivation by learning outcomes results.

(2) Standardization of K-12 educational programs in whole Europe Union (EU) and European Economic Community (EEC). K-12 graduates should be competitive despite on institution and country where secondary education was acquired:

- Equal standards, equal requirements and equal opportunities for any pupil, secondary school leaver, to enter higher educational institutions in any EU or EEC country;
- More effective activation pupils' exchange program within EU or EEC.

(3) Implementation of the main idea of ADL (Advanced Distributed Learning) by means of distributing and redistributing of learning and teaching materials, sharing and reusing them. This ought to be applied for open education:

- Further development of SCORM (*Sharable Content Object Reference Model*) standards which would be implemented in different types of technology enhanced learning, the uppermost – in e- and m- learning;
- Development and use of open learning management systems which allow producing of SCOs (*Shareable Content Objects*), their copying, distribution, sharing, re-usage and re-making;
- Interoperability principles should be placed as prior ones.



(4) Gaming would capture the teaching initiative of primary education. Some considerations which would defend this position:

- Learning by doing approach – allows kids better understanding of theoretical materials;
- Learning through gaming can remove barriers and help kids adaptation at school;
- Educational games might be used equitably at school, as well at home and outside.

Besides, based on research made in June, 2012 by Assessment and Information group of Pearson, there are additional five benefits of digital gaming in education. Digital games [1]:

- „Are built on sound learning principles,
- Provide more engagement for the learner,
- Provide personalized learning opportunities,
- Teach 21st century skills,
- Provide an environment for authentic and relevant assessment”.

(5) An implementation of the synergy of e-, t- and m- learning within school programs:

1. E-learning:

- Already exists but despite some progression there are still lack of useful open educational resources;
- A coloration of e-learning in 2030 will appear in its overtness, wide use of interoperable SCO modules in interoperable e-environment.

2. M-learning:

- Modern mobile phones wide screens, reach software, great network coverage and relatively low expenses make mobile phones (especially – smartphones) as the very powerful learning instruments; and m-learning – a great supplementing, and in some cases even basic, form of learning;
- Almost each pupil in EU or EEC holds at least one mobile phone. A number of smartphones booms. It could be expected that almost each pupil of secondary school in EU/EEC will have the smartphone by 2030.

3. T-learning:

- T-learning will revive by enriching its potential with availability to learn from watching video learning materials, accomplish corresponding tasks given during broadcasting, and tests, which would be possible to do by TV switchboard. This could be achieved by providing special school TV channels or coming to an arrangement with broadcasting companies to include t-learning materials into their broadcast program;
- Videoconferencing tools and recorded materials also ought to be considered as considerable learning enhancement instruments.

Thin borderlines between mentioned different forms of technology based learning will disappear by 2030. This melting process has already started.

Setting and further development of appropriate standards is essential. Some of these aspects were introduced in the 3<sup>rd</sup> paragraph.

(6) Facilitating critical thinking and reflection within ePortfolios:

1. The usage of ePortfolios in the form of a showcase, which could be used to show others pupils's achievements, will remain. This ePortfolio form could be used in cases when the demonstration of accomplished works becomes important (for instance, in drawing, botany etc. lessons). This form in a few years will converge with another form of ePortfolios – workspace ones.
2. Further development of competence enhancement systems equipped with variable assessment tools and collaborative environment. It might be used for both pupils and teachers: for pupils – to study, improve learning outcomes, assist classmates, make peer and self-assessments; for teachers – to tutor learners and monitor their progress, make assessment of study process and provide necessary steps to improve curriculum [2]. Advanced ePortfolio systems can establish an understanding of collaborative environment and group-working, allow pupils become responsible for own and classmates success.
3. Admittedly, ePortfolio system in the form of workspace (the second noted form of ePortfolios) will take the lead over ePortfolios as the showcases (the first noted ePortfolio form);

(7) Various kinds and types of summative and formative assessments will be provided within educational institution's information system. Such system may consist of e-content and learning part, on the one hand, and ePortfolio part, on the other hand. Both parts could be placed independently from each other or be tailored. They will have two main aims:

1. To assist teaching staff to monitor and analyse learners progress and knowledge acquisition change dynamics;
2. To help pupil assess own achievements, possible gaps and directions which ought to be improved.

(8) Traditional library approach will be shifted to mostly open information and educational resources' e-spaces. Educational resources ought to be free of charge for learners, especially when it applies on scholars in elementary and secondary education. It might be realized by:

- Digitalization of existing learning objects;
- Development further learning objects in digital way;
- Creating of school e-libraries and e-repositories (as an integral part of open source Learning Management Systems / Content Management Systems) within particular school common information system;
- Creating of elementary and secondary school consortiums at city / county / country / EU level which would unite and offer to pupils and educators available open educational resources;
- Providing appropriate open teaching and learning materials through municipalities' or/and independent organizations' web pages;
- Establishing of teaching / learning web-based communities where teachers can easily and free of charge share with colleagues their digital e-courses and other learning objects (for example [3], similar teachers' web-resource already exists in Latvian Republic - <http://skolotajs.lv/>)

(9) Digital classroom in digital ecosystem:

- Interactive blackboards in the classrooms;
- Total usage of digital text-books – anytime and anywhere;

- Wide implementation of videoconferencing tools – schools will be able to get top-lecturers and teachers, as well keep in touch with telecommuters and collaboration partners.

(10) And last but not least – logistics, environment and raising the productivity of teaching and learning issues. To ensure suitable conditions for better mastering of learning materials:

- Classrooms in 2030 will be equipped with climate control and ventilation systems;
- Governments / municipalities will provide necessary subsidies to ensure that every pupil receives balanced diet lunch.

## Conclusion

It is imagined that by 2030 any pupil will have an access to free of charge learning objects tailored in common open information system. This system will ensure the synergy of different types of technology enhanced learning, such as gaming, e-, t- and m- learning, which will create prospective learner-friendly educational ecosystem with possibility to share and reuse learning objects. This will become an everyday occurrence. The ePortfolio system with its comprehensive assessment tools and collaborative environments will complementary perfect the knowledge acquisition process in secondary and even elementary schools. All-embracing digitalization will cover whole educational system and learning environment.

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## Worldwide education/Cooperative education

José Ramón Jiménez Gil

*Only if Europe is seen as an inclusive school and Globalization as Cooperation we will be able to speak about Equity*

Nowadays, Education is following a path which leads us to a worldwide education. What does it mean?

It simply means that education is no longer an isolated aspect belonging to a local and political authority. Worldwide Education is becoming a reality and some of the tools we teachers use confirm that.

There will be a day when pupils will be taught by different teachers from different countries. That is an idea I love. Imagine your students having some lectures by Skype or any other future tool to come. Imagine yourself teaching students from Sweden, Portugal, Germany from your own school. Imagine yourself preparing your lessons with other European teachers.

In some way, that is something we are doing today. Etwinning has provided us with this kind of education. Etwinning was launched in 2005 (only 8 years ago) and it was a revolution in the way of teaching and learning. If we have been able to change the way of understanding education in 8 years what will happen in 17 years to come?

Comenius has also made borders disappear. People travel all around the world and people bring with them their way of learning, studying and education itself.

Let me compare this idea with the “Camino de Santiago” centuries ago. People travelling along the Way learnt from the local inhabitants and citizens from the small villages along the Way learnt from the travellers.

This comparison leads us to the second part of the main title: Cooperative education.

Cooperation should not be understood as a way of exchanging material and information. That is the way education has been for many years: the teachers as transmitters and the students as receivers.

We teachers will not only teach but we will also learn from our peers and from our new students. Students will not be passive agents any more. They will be active part in the learning process.

Even the local school will take another different role. It will be in charge of providing students with the tools and materials they will need making possible the equality and equity every child deserves.

Cooperation must be seen as collaboration from the very beginning of the process to the end of it. This way not only teachers but also learners will get engagement and motivation.

It will not be the teacher the one to assess. Evaluation will be a global process where teachers, pupils, parents and society will be involved

This new point of view forces us to change our mind and the pedagogical methodologies and practices we are used to. The school is no longer and isolated event affected by the city and society that surrounds it. School is part of a global way of understanding the world we live in nowadays. Students from different part of the world will be linked by means of education and this fosters active citizen and inclusion

We are said to be living in a global world where economic and social aspects equally affect us regardless the city or country we live in but Education has not followed this path in the same way. There are still more differences than similarities in the way education works along the world.

Economical issues are impediments which avoid every single person to access the same type of education and it is in this point where governments should play their roles providing and making possible that every child has the right to be educated in the same way.

To sum up we can say that we teachers and pupils are ready to carry out and undertake this new task

Worldwide and Cooperative Education are the keys to get learners/teachers engagement and motivation, to make possible public and private interaction and to foster active citizenship and inclusion. That is: Equity

What are we waiting for? Let's see each other in 2030.



## **Children contribute to their school and learn by making**

Gisèle Legionnet-Klees

*Teachers create the space for the children to learn, drawing from and contributing to the open education resources. General digital literacy and demanding education standards allow children to do significant contributions to the open resources.*

Today, our schools essentially teach children to become citizens in a world where digital technology fuels globalization of ideas and economies.

In 2030, schools will be a framework where children become amplified individuals in a highly connected world where the physical and the digital are no longer discernible.

As I am a designer of digital services, I ask myself: what would it be like to design an open education environment in 2030? Who will be designing it? With what tools? For what purpose? Who would be using it?

To start, I look at a bigger picture of society and economy. Then I define objectives, and finally think about technology and features.

### **Bigger picture: What does the adult life of children who go to school in 2030 look like?**

This means looking at the year **2050**, when kids leaving school in 2030 will be adults.

These individuals will have experienced a life where planning beyond 3 to 5 years is impossible, where large-scale changes have taken place in the course of their lifetime. They need to be able to survive (food, air), make sense of things (culture) and feed their family (economy).

Nature will be highly technified and the human body will be enhanced by self-improvement technologies and practices.

Living spaces will be mega-cities within which community-based activities will cover needs such as food production, social interaction and education. People will spend a larger share of their resources on food than in 2013. The organisations which will be able to create compelling stories for their co-owners will make the biggest profit.

Information will be everywhere. People will organise in communities to build their own houses and equipment, make their own clothes and create their memories as blended physical - digital artefacts. Mastering crafts like wood working, painting on paper... will be rare. Outdoor activities will be exceptional in everyday life, and will take place outside of the city. The countryside will be largely empty of human life.

For large parts of the population, money will be a lot less abundant than in 2013. Hence self-sustaining communities will have formed to create liveable spaces for young and old. These communities will not be limited by geography but more by shared interest and values.

Work will take place anywhere, everywhere, and will happen within the community as well as in larger entities.

These communities will generate their own learning environments. Children and adults will learn side by side, in a system of mentoring and peer to peer assessments.

In terms of safety and security, there will be global threats. Every individual will have her own digital self-stored and identified. The universal connection scheme for objects which will have evolved from the internet of things will enable large scale monitoring of people and their activities. But the collected data will also be made available to all.

Significant improvements will have been made in the area of the ergonomic design of digital objects in order to enable the wide-scale adoption of technology and to avoid large-scale risk, from mind-controlled displays to robots.

### **What are the skills the children in 2030 will need to learn?**

From our above scenario, some skills and knowledge can be described:

- building meaningful relationships
- being part of a community and contributing to the community
- being able to adapt to changing environments
- being able to sustain oneself
- being able to build, use and share knowledge
- navigating the physical and the digital spaces
- being able to understand, craft and contribute to the digital technospace.

### **What will it be like to go to school in 2030?**

It has been suggested by Sugatra Mitra that in order to learn, children merely need three things: connectivity, collaboration, and encouragement. The process he describes in his SOLE Challenge revolves around asking big questions, and then let the children self-organise in small groups, with connected computers, and give them positive feedback and encouragement "like a grannie would do."

This could be a powerful model to make use of free available resources on the web and by 2030 this experiment will certainly have left traces in the sand of the school system.

Let's think of a school ecosystem in which this experiment has left its traces and where open learning is the main resource.

The relevant components of this ecosystem are:

- children and the age group they belong to
- the knowledge made accessible to them
- the available teachers
- the skills the children can learn
- the assessment of the acquired skills and knowledge
- the method through which the skills and knowledge are acquired

- the knowledge the children make available to others as a result of what they learned and created
- the community in which the school operates

We see the need for a **framework**, for instance in the form of tagging information attached to learning resources, which teachers would be able to use to configure the learning experience, prepare the assessment and enable the outcome of the work both by teachers and children to be made accessible to the community of learners and teachers.

We suggest that in order to truly support children to develop their personality in a world of amplifying technologies, where English is a natural language across Europe, where digital spaces are almost melted with the physical space, it is of high importance to give the children the possibility to make their own things and to grow their own food.

We propose that children are given assignments and tools to build interactive objects using both digital technology and traditional crafts using paper, wood, fabric, metal...

Already today there are open source projects enabling the construction of interactive objects, from LittleBits to Arduino. As the digital space will have become integrated with the physical, children will be able to use open source code, patterns, instructions, and also come up with their own inventions and share them with their community of peers.

Open source will be the true ... source from which the community will be able to store and expand its cultural heritage, including for and from its children.

Today, companies are able to create closed ecosystems on the basis of the work shared in open source. We would suggest that with the widest possible acquisition of making and coding skills, communities will be able to take ownership of the things they need.

Expanding this vision of sources of information widely available, the role of the teacher will be this of a mentor, and parents and other adults will contribute as experts in their field towards the children in their community. An important facet of the mentoring role will be to help students stretch their perception of the world to understand the complexity of the systems, and to learn to think as “solutionaries” as suggested by Zoe Weil.

Due to financial pressure, schools will work on a freemium model where only 80% of classes will be free of charge. 20% of classes will either cost money or require contribution of the children or their parents, e.g. as mentoring, teaching, producing materials or other activities relevant to the school.

Learning needs and learning successes will be predicted and logged in the framework.

Based on standard curriculum, individual characteristics like IQ, country, age, origin, previous learning log, priorities of development, individual priorities. Learning needs will be the basis for the activity schedule. For each child at school, and for each adult in the community, the learning objectives will be stated. Within the school system, parents and children make certain choices. The system then gives recommendations for activities and topics.

In conclusion, we hope that schools in 2030 are a protected but connected space where children learn to collaborate, share and make things, in a community focused manner.



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## ICT in Foreign Language Teaching

Emanuela Leto

*ICT and English complete each other in modern school education.*

### ICT IN FOREIGN LANGUAGE TEACHING

Teaching foreign languages has always been asserving experimentations as new methodologies and approaches have been arisen since communicative methodology sprung up. ICT and foreign languages live together in a fruitful way and this is the reason why teaching English through ICT is really effective. Moreover as English is ICT languages and so each one recalls the other. A new way to teach and learn English to teenagers is opened by the possibility to carry on interactive lessons through the use of a media lab. The advantages are that the use of new tools such as media interactive games or activities involve the students' know-how and their daily routine .Teenagers spend their spare time surrounded by technologies (computers, mobiles, mp3s,i-pads,videogames etc.) and the chance to use the same tools to learn and not only to play or spend their free time involve them in a more successful way.



This is the classroom where I teach and my students learn English.

They are teenagers (11-13), in a small suburban school, in a small town facing unemployment and increasing poorness issues. But they are happy to come to school.

There's a lot of space given to self-learning, through single, pair or group-work. They learn to use applications such as Word, PowerPoint, Movie Maker too, as they need them to create something. We work in projects to produce something new. English language is a means of communication but also a means to learn to do other things. Teaching English is really interdisciplinary and students can be involved in whatsoever and learn to do



it in English, too. ICT are really necessary if we try to overcome this challenge. The challenge is to teach and learn English in different interesting ways. This year we experimented with Wallwisher/paddlet: we created Christmas 'greetings and a Wishlist for New Year's Eve. It was amazing and open to all the students who reached the walls on the Interactive Board and figured out their messages trying to find the right words and expressions. We published them all at the end and it had a great success! Students learned to great each other and to express wishes in a really pleasant way!! Moreover they learned to use a new tool useful for each subject they study, such as a mind map or a presentation. This is the real challenge school has to face and we cannot come back on the paths of Technology .



In this image my students are working alone: That's the best! To make them independent, learning to learn by themselves.

Activities are always carried on with the support of the teacher, but the role of the teacher can be that of the mediator, no more the knowledge holder pouring on the students' ears. Not only, but the teacher needs to know ICT not to be overcome by the younger

generations of his/her students and in order to speak the same language his /her students speak. The teacher is and has to be a facilitator of learning, but learning cannot leave out of considerations the new world we all live in.



## Openness and Compulsory Rural Education 2030

Ronald Macintyre

*Try not to be so gloomy, once openness moves beyond the academy we will see the development of a more just society.*

### Introduction

Back in 2013 when I wrote a vision of Openness and Compulsory Rural Education in 2030 I never thought that I would ever look at it again. Here I am 30 years later, ruefully thinking about my own vision, and looking back to 2030. In this short paper I try to uncover why I was so wrong, looking at the things that influenced my own thoughts, but also looking at those things that I missed. In 2013 I was asked to a workshop in Seville Spain to talk about what was then an emerging area called Open Educational Resources, or Open Educational Practices, a term that has largely now fallen out of use. What we now regard as being “the norm”, that publicly funded content should be freely available, was somewhat of a novelty then. More of that later. First let me tell you a little about myself and why now, all those years later, I have returned to look at the out of date paper I sent into the School Education strand. I have returned to it because I am moving. At the age of 30 in 2003 I returned the West Highlands of Scotland to raise a family, I was 40 in 2013 with young children the same local primary I had attended, and now I am 60, and I am moving to the city. I work as an academic, and have a horticulture business, like all local food business we do very well, but I have 15 years of working life left, my bones ache, and I am looking for a new challenge. Therefore my partner and I have decided to leave our family home and have one last go at “city life”. Those ages with zero at the end make you think. My oldest son is 30, he is a systems developer working control and monitoring systems in low energy food production, with a wife and my first grandchild on the way. He is taking our home. Hence the review, dusting of old files, old ideas.

So what did I think that 2030 would look like back in 2013, well when I look at it now I think I was less influenced by thoughts about openness and more influenced by a Scottish Government review of Rural Education that came on the week I was writing. It was a long awaited review, as rural schools were increasingly under threat of closure, many thought this would provide some sort of guidance. It did not. However, it was my sense then that this lack would lead to inertia until the 2014 vote and 2015 elections, then school closure. I was pessimistic, openness would be a component, but just as a means for middle class well educated parents to supplement the reducing education provision in rural areas, while most pupils gazed onto screen, plugged into interactive content and doing online assessments. I was wrong in all sorts of ways.

The second big influence was a systematic review of rural education provision that I had produced for the Open University in Scotland in 2011, at the time I was updating the review and thinking about submitting it as a journal article. The central argument behind the review was that there was two types of education in rural areas rural education, and rural education, with the former tending to be post school, centred on land based industries, and targeted at young men who did not get on well in school. The later, focussed on “academic” subjects and

the “brighter” pupils, it was about getting them into College/University, and rurality was not context, but simply a problem to be overcome. My assessment in 2013 was that little would change. We would still have an education system that favoured a particular type of learner and a particular type of learning. I suppose I was jaded, Education Scotland's Curriculum for Excellence had promised a more open and integrated approach to education, where grammar was assessed through History, or syntax through C++ coding, but it was not happening. Perhaps it was because they were attending the same school as I had, but somehow the liberal 1970's had provided me with a more open experience, seemed to have been replaced by managerialism.

The third big influence was an international conference I had attended in 2005 in rural Virginia. At the time my move “back home” had meant leaving behind Higher Education, as in those days people were expected to live close to their employer, and I was was a youth worker, but still writing. I ended up in the education stream of the conference and during a group discussion we were asked how many of us had been told in school that if we did not work hard we would be stuck in this place for the rest of our lives, most had. When asked if anyone still lived or had returned to said place only two of us put our hands up. It seemed to me then that the purpose of rural schools was to facilitate rural depopulation, and I am not sure that thought has ever left me. In 2013 the open landscape was dominated by prestigious HE providers, my own work into social inclusion, technology and rurality had found that rather than technology allowing rural residents to access new opportunities, it actually meant that larger centrally based providers had greater access to rural markets. If the same pattern followed in open educational practices, then we would see content dominated by major providers in school, and (as noted above) middle class parents supplementing schools offer with content developed by prestigious providers. Content that did not really account for the needs of rural communities. Openness would simply accelerate the pace that young people were sucked out of rural areas.

I look back and I think how gloomy I was, perhaps it was the economic problems, the neo-liberal Government in London, the thought that Scotland might not vote YES, the global ecological crisis. I do not know. However, its the bits I missed that surprise me now. First of all I missed the fact that I had returned, and I did not notice that lots of others had to. I did not notice that one of the main problems with our own small rural school was that it was crammed with pupils. Strangely the policy inertia of 2013 lingered on, school closure was politically too hot to handle, the Head Teacher needed our help. She could not keep the doors closed any longer, the school would burst, so she opened up the school to parents, to flexible content and flexible study hours. Another thing I missed, was the the messages that were coming from chance meetings with people who shared similar interests in rural education. For example, a chance meeting at a conference with someone from what was then called Scotland's Rural Universities and Colleges (SRUC), SRUC had just been created, and it was in a state of “becoming”. A follow up pint in the local pub led us to talk about what rural skills meant, that the skills required by school leavers who want to remain in rural areas, it was not just about fencing, fish farming and forestry, but about enterprise, innovation, technology, and all the other things that people needed. As this was one of my favourite “couple of pints” topics I did not recognise the growing consensus that rural education was broken, and did not think it significant.

Increasing fuel prices and a more general awareness of energy and the environment also had a profound effect. First of all locally produced food became competitive, demand grew and people who had land started to produce food. Secondly, biomass heating meant the forestry market took off, the big threat was that it would be all for export, but actually through the Scottish Governments “Right to Buy” local communities started to purchase environmental assets. For example, we purchased the local woodlands, gave local people the confidence to



set up business's, from furniture to wood fuel – it rebuilt the rural economy and rural hopes. The third thing that happened was that communities invested in local assets. For example, we bought a river and built a hydro scheme. With that money we invested in further renewables developments and started to build up a large community fund. It is also worth remembering (and reflecting on) just how novel that community owned land, community owned renewables was back then. Its obvious now, but back then the link between openness and community ownership was not clear. Let me spell out that thinking. These community enterprises needed to be open and transparent, a few of us across Scotland got together and based on open licensing created an open and accessible portal for communities, with open data, for example in energy production, to openly accessible business plans, and learning resources.

Suddenly, rural schools were being forced to open up, rural communities had confidence, resources, and young people had a reason to stay. The EcoSchools and Forest Schools movement provided us with a framework to take learning out of the classroom. That was great as it increased environmental awareness and helped to include a wide range of pupils by integrating educational content with practice. However, the type of education content we were now looking at required access to a broad range of resources, from education about GIS mapping, to coding of remote sensors, from fencing and ditching, to energy distribution and accounting. Renewables provided funding that helped with that capacity, but I now realise open licensing was crucial to making it work. Firstly open data was important, people (parents) could take open and accessible data from their work into the classroom and work with teacher and pupils to look at real world problems. That was great, but if I am honest I was nervous, I was not sure I had the depth of knowledge and understanding to become this new kind of parent -teacher hybrid. Oddly, we worried about capacity and how we would access content to support these new learning experiences. Looking back, parents (and grand parents) went into Schools in 2013. My own father went in to talk about local Gaelic traditions, as a language and a tradition bearer. What I missed in 2013 was that community ownership and open licensing started to change the way people thought about knowledge and practice. For example, after he retired from work my father started experimenting with social media, he was uploading all sorts of material online, stories song, video, audio, all openly licensed. It was part of a Gaelic revival, informal learning resources started to accrue, then we started using these in classrooms. I suppose I missed it because at that time it was still small online communities, I did not realise, parental involvement in schools would lead to the production of educational content moving beyond the academy, open licensing would make this content freely available.

Futurists are liable to end up red faced, as I have. At least it has turned out a lot more positively than I expected. Why did I miss all those things, perhaps it was because the emerging sense of openness was still largely seen as HE led, we had not really thought about what would happen if everyone started to practice openness, opening up schools, data, new opportunities. Well that is my excuse. I suppose you also might want to ask why I am heading to the city. Well property is very affordable in our cities, and I suppose I felt like it was time I moved aside and let another rural generation have a go. Plus, the challenge, our cities have been neglected for too long, I hope they might benefit from some rural expertise.



## **Girls are going to save the world!**

Cheryl D. Miller

LinkedIn: <http://bit.ly/CDMLink>

Tedx Speech: <http://bit.ly/cdmTEDxTalks>

FOSDEM Speech: <http://bit.ly/cdmFOSDEM>

*Let's build a pan-European gamified, online platform, supported by (female) mentors and role models, for engaging girls to carry out socially-oriented projects in their communities using Science, Technology, Engineering and Mathematics*

### **1. The world needs more girls and women in STEM (science, tech, engineering and math) fields**

- Too few girls and women take up studies and careers in STEM fields
- Too few women are leaders in STEM fields
  - important priorities and decisions are made and research and activities carried out without female involvement and input
  - involvement of girls/women in leadership has positive impact on families, community and wider society with their involvement
- The world, our species and our fellow creatures suffer from the lack of women in STEM
- Something needs to be done to change this pattern!
  - From an early age
  - In a hands-on, result-oriented, practical and fun way!

### **2. Gamification is a way to engage girls to start, carry out and finish projects that help their broader communities (see: <http://www.urgentevoke.com>)**

- Gamification is gaining broad acceptance as a way to engage and keep audiences engaged in projects with a remote-ish result horizon
  - Games are fun because they are built on incremental payoff structures
  - Competition, and incremental reward keeps participants engaged in all stages of the process
- Learning is easier and more effective when it's fun
- Gamified, project-learning that has a concrete result is appealing to girls and provides functional, expert and social skills that are reusable
- Girls, boys, let's face it, everyone is excited by activities that are fun, hands-on, rewarding (personally and for others) and result-oriented

### **3. Making STEM social, result-oriented and positive will get more girls engaged in these fields**

- Girls want to use science and technology to help people and society
- Practical, project-orientation with concrete, measurable results, milestones and timelines drives engagement
- Support of experts and role models in fields creates transfer of know-how and inspiration for girls

### **4. Matching girls with (female) mentors in STEM fields has an added-value**

- It increases the likelihood of success for projects started
- It gives girls role models to look up to and aspire to become, particularly in STEM
- It puts practical knowledge of experts and role models back into practice with young people
- It has the added promise of spurring innovation, research and entrepreneurship by girls who become mentored by female and male role models in STEM areas

### **5. Spill-over and multiplier effects**

- Such an online community can be buttressed and supported by webinars and face-to-face workshops/classrooms by experts and “young role models” created by the network
- The online platform can promote pan-European teams working on large-scale, real problems faced by real scientists, researchers, entrepreneurs and communities everywhere
- It can drive research and innovation by young people (girls) in fields that are traditionally closed to them
- This work can be linked to exchange programs, interfacing with kids in other countries and even on other continents to bring solutions to communities in need around the world
- The platform can be integrated with MOOCs and other online knowledge tool making the entire process user-driven and coached by real, committed people and role models
- It can connect with life-long learning and e-learning communities to activate the silver generation and promote cross-generation innovation, especially among girls and women

### **6. Conclusions**

- Girls need STEM knowledge and empowerment for the benefit of humanity, the planet and our fellow creatures.
- Learning needs to be fun.
- Youngsters need studies and careers that have a practical, beneficial and positive impact on the world.
- The world needs girls (and boys!) active in their communities doing good.





## **A new model of learning based on new methodologies supported by new technologies**

Antonio Monje Fernández and Miguel Ángel Pereira Baz

*CeDeC -Spanish National Centre for Curricular Development with non-Privative Systems*

*By 2030 a new model of learning based on new methodologies supported by new technologies will emerge.*

The experience of CeDeC allow us to bet for a new model of schools and learning. According to the Spanish experience the future for innovation and specially for making the open educational resources as the principal tool for teachers and pupils has to be focused on the creation of resources that were building on methodologies as Project based learning or cooperative and collaborative learning.

Here from the Spanish CeDeC we have started to work in this model and can show some models of OERS. The first experiences seem to show us that teachers, students and even parents and public administrations are in a very good position to make possible that during the next twenty years OERs could contribute to create a modern and really successful model of learning in the schools.

Making this it will be possible to get that teachers and students could see in the OER a real new way for working at the schools. If not, nothing will be really changed and besides the new technologies we'll continue supporting models of learning not focused to the real success of our students.

Our opinions are based in our previous experiences. During the last five or ten years Spanish administrations have made a big effort in order to promote the inclusion of the new technologies with plans as "School 2.0" trying to put new infrastructures in the classrooms: computers, internet connections and even a massive donation of digital boards.

However, and according to the last studies an statistics, the effective results have been too short. The traditional way of teaching and learning is nowadays used by a high majority of teachers and no significant changes have been included in the classroom.

As a consequence, we think that a new way to introduce the new technologies in the classroom have to be explored and promoted. As a matter of fact, a good way could be the creation (and promotion of creation) of resources giving teachers and students practical, useful, flexible and simple ways to work with new methodologies.

Betting for the Open Educational Resources could (and maybe must) be the way for getting this. Looking for the 2030 year, as presented in the Opening up education initiative. This OER we'll have to be created and spread by the public administrations. Special departments will have to be the dedicated to the production of these materials and at the same time in the promotion of the use of them in the classroom.

Obviously, this work should start right now. The task for the next five or ten years have to be these departments to start producing the OERs and at the same time start with project making them to be introduced into the teachers diary work.

### **Working for the 2030's OERs**

We think that the principal task for the year 2030 has to be the massive introduction of the OER as the principal tool for educators in all the schools.

To turn this possible some different actions should be adopted:

- The creation of specific, high qualified and adapted resources. This work has to be reserved for public institutions.
- The training of teachers in two principal ways. On one side, the creation (design, tools...) of OERs and on the other hand a very much important question: the appropriate methodologies for this OERs.
- The promotion of plans, projects and initiatives in schools including the use, spread and training about how and why OERs can contribute to the progress and success of the educational work.
- The option of the public administrations for the free licences (specially Creative Commons by sa) to be adopted for all the material produced with public funds and support.

### **In some little words**

OER seem to us the future of education. No other way could guarantee the quality, equality and progress of the students all around Europe.



## **Real Impact for Better Learning: The road to Education in 2030**

Kirsten Panton



*We believe that technology solutions ought to be as unique as the teachers and students in each classroom and we fundamentally disagree there is a one-size-fits-all technology solution.*

There has been much discussion in the media lately around the state of the educational system across the world. While some markets fare better than others, as a rule, the world has an education problem to solve. Students are not graduating from primary (high school) or secondary (university) schools at optimal rates. Many countries' unemployment rates are high, yet skilled jobs in each of those countries remain unfilled, affecting businesses in nearly every industry and region around the globe. As a result of the 2007 economic crisis, unemployment rates for youth soared from 13 percent in 2008 to 18 percent in 2010, the sharpest rise on record for any part of the world, with some countries like Spain and Greece having a youth unemployment above 50%. The International Labor Organization reports nearly 75 million youth are unemployed around the world, an increase of more than 4 million since 2007. As a result, education's greatest challenge and opportunity is to prepare students for the jobs of tomorrow and be personalized enough to help each student reach their full potential. If this is accomplished, logic assumes these same students will go on to pursue skilled jobs that will ignite countries' economies and competitive edge.

As with all areas of reform, technologies are key to transforming the learning environment. Too often technology is bolted on and not integral to enhancing and assessing learning within schools. Schools need access to technology for all students and teachers in order to support anytime anywhere learning, personalization and 21<sup>st</sup> century skills.

In difficult economic times, minds are easily distracted with short term fixes, we are seeing many institutions where short term technology fixes like parachuting a certain device, like an iPad, a Chromebook, a PC for that matter, into the classroom with no guidance or regard for what really needs to be fixed in the system and time and time again we are seeing them fail. With schools left with defending technology spends that are not impacting outcomes. The good news is that we have found that technology coupled with an honest look at changing and innovating teaching practices in combination can have an impact to increase learning outcomes.

Cutting costs today often means postponing fundamental investments and opportunities that are fundamental to increasing education outcomes and providing better learning opportunities to our students. Private organizations like large technology companies and the education industry at large must join forces to provide these opportunities through innovation and efficiencies with real impact regardless of the amount of money available to us. I wanted to take this opportunity in our unique position of leading the marketing of one of these companies, Microsoft, to singularly focus on what we can do to help effect this change.

In education, Microsoft is more than a services, software and devices company. We're a company deeply vested in and committed to doing our part to solve this problem. Our approach to accomplishing this is unique. We believe technology has an important place in the classroom but, most important, we believe teachers are central to helping students succeed. This is why we have invested over \$750 million dollars and countless hours of human capital to train teachers, provide them with professional development opportunities, and connect them with each other to inspire classroom best practices.

We believe, when implemented correctly, technology has the power to inspire and motivate students to learn, and the ability to empower teachers to teach and prepare students. When a school is ready to integrate technologies into classrooms, our approach is unique still.

- We believe technology solutions ought to be as unique as the teachers and students in each classroom. We fundamentally disagree there is a one-size-fits-all technology solution.
- Hence, the emphasis we place on partnership with schools: We commit early to partnering with schools for the long haul because the hard problems don't stop surfacing after an initial technology investment.

We believe increasing graduation rates requires everyone's involvement – parent, community, government and private sector. And we believe it requires, in addition to these aforementioned investments, an emphasis on curriculum design, assessment, school leadership, inspiring learning environments, and teacher capacity.

Our Vision is to truly bring *Anytime anywhere learning for all* to light.

So now that we have clarified Microsoft's position, let's now turn and look at what education systems could do to effect change and a few suggestions on how to go about making these changes. It has long been understood that education is central to the development of individuals and to creating socioeconomic opportunities in communities around the world. Yet many nations find that their current educational systems are not engaging students or preparing them for the future.

Sparking the natural curiosity of young people and enabling them to be successful in the workplace often involves changing an entire education system, rather than just tinkering with its parts. Systems, whether biological or organizational are comprised off interconnected sets of sub-systems. Changing just one or two parts of the system may be helpful, or it may be harmful or have no discernible effects, depending on how the change interacts with other aspects of the system.

Similarly, transforming education is traditionally challenging, and there is often a discrepancy between policymaking and true change in the student learning experience. We live in a time of constant technological change and innovation, which affects nearly every aspect of our lives, from the way we communicate to how we do our jobs and spend our leisure time. Yet in a world of education comparatively little has changed. Classrooms across the world look much as they always have, with a single teacher in front of a blackboard imparting lessons to students seated at rows of desks. The school day is divided into periods that correspond to specific subjects in a fixed curriculum. Through this traditional model, some schools might add in a bit of technology as a way to increase efficiency or access to information.

Compare this to the lives that young people lead outside of school. In increasing numbers all over the world, they browse the web, download music, visit chat sites, upload homemade videos, and communicate with friends using instant messaging, watching multi-channel digital TV, blog about their experiences and read books, magazines and articles online. Much

of this activity happens simultaneously and on portable devices. In this increasingly interconnected world, young people have an expectation that experiences, services and products can be configured to their individual needs and preferences.

The challenge for education in the 21<sup>st</sup> Century is to create an approach that is agile, adaptable and in tune with young people lives outside of the classroom and their future employability. The answer lies in innovation, but the question is what kind of innovation, and how should it be implemented?

The solution is complicated, and using technology as the only solution will not solve these challenges. Even when introduced in schools with the necessary physical infrastructure, simply giving each child a computer will typically not produce superior learning without additional changes in the nature of the school's teaching, learning and assessment practices (M. Dynarksi, 2007). In this example, effective change would require a more holistic approach to completely transform the learning experience of the learners.

Through Microsoft's work with innovative schools, which are a set of 100 schools around the world that have been selected for their innovative moves in education we have identified four areas for systematic innovation to get us to the school of the future. Below the surface of a successful school is a system of connections and interrelationships that enable transformation in a focused and coordinated way. A helpful framework for thinking about systems innovation is adapted from the work of Knapp, Copeland and Talbert (Knapp, 2003) The goal of the framework is to help coordinate changes so that they that they complement rather than compete with one another. The framework highlights four top dimensions:

- 1) Fostering Leadership and a Culture of Change
- 2) Teaching, Learning and Assessment
- 3) Building Capacity with Educators
- 4) Learning Environments

Many innovative attempts to introduce student-centered, problem-based learning and technology rich learning environments have not succeeded today because they collided with existing, and sometimes outdated-assessment practices, or because professional development for teachers and leaders was underemphasized (J. Roschelle, 2008) Using these critical areas for reflection helps innovators think through each of the pieces of reform and how they interrelate, to drive forward change.

How can the school develop a culture that is conducive to innovation? First, by fostering leadership and a culture of change.

At the heart of the innovative process is a school culture that is dynamic, forward –looking and empowered. In Michael Fullan's book The Six Secrets of Change, one of the elements of successful change is understanding that learning is the work. As he says, "Learning is not workshops and courses and strategic retreats. It is not school improvement plans or individual leadership development. These are inputs. Rather learning is developing the organization, day after day, within the culture."

An innovative school is not one person's creation but rather the product of enabling whole school to help design new processes and procedures. This requires successful management of relationships at all levels across the school and beyond to include parents, community and other stakeholders. A particular focus is on leadership development, preparing administrators to be instructional leaders, supporting a distributed group of leaders rather than a select few, and devising plans for developing leaders and leadership at all skill levels. These leaders are

responsible for promoting a school-wide learning community that keeps all stakeholders working together on the common goal of improving student learning.

In addition to the development of individuals, a culture of innovation depends on organizational development and management. Another way to facilitate innovation is changing school structures such as facilities, programs and use of time. Finally providing time during the school day for staff collaboration and school networking can enable effective change.

Continuous evaluation is necessary for developing and sustaining a culture of innovation. Successful innovation requires that schools use technology-based analytical tools that help them measure student outcomes and identify those who are struggling academically and their areas of underperformance. By using such systems, educators can more effectively deploy resources and intervene at appropriate points. At the school level, measures of progress can range from student attitudes and achievement to overall school metrics to attendance and drop out rates.

The next area we should look at is teaching, learning and assessment. How should curriculum be designed, and how should students be assessed? How can student directed learning be encouraged?

In most countries, school curricula and instruction are mostly didactic based on subject-based knowledge transmission and large amounts of rote learning. This ignores many skills that are increasingly necessary for life and work and often fails to engage students. Of course, schools implement and work accordingly to national standards and other learning requirements, but they can also consider more effective teaching and learning strategies and encourage student centered learning and assessment processes.

Many innovative schools actively engage students in their learning and in the co-design of the learning process. There are a variety of ways of doing this, from the use of student councils to students as researchers within schools, to online student feedback on the quality of teaching and learning. Technology skills are crucial in the 21<sup>st</sup> century, but technology should play a bigger role in the transformation of learning practices. High-level ICT integration increases the possibility of personalizing learning processes, and making learning accessible to students anytime and anywhere.

Thirdly we need to build capacity with educators. How can teacher skills be identified, taught and measured? What kinds of training and development are needed and how can their effects be measured?

Just as student learning must evolve beyond a transmission model to actively engage students, teacher-learning means more than attending required workshops and teaching in isolated classrooms. Experts agree that true professional development involves establishment of a professional community focused on learning.

Teachers need continuous training and supportive assessment to cope with the demands of the changing educational landscape. One route is for schools to develop their own models for training and apply these consistently. Professional development includes peer-to-peer coaching and mentoring not only for newly-hired teachers, but as an ongoing practice for all teachers. As with other areas of reform, technologies offer opportunities to transform teaching and the support of teaching learning.

Finally, we must address learning environments. How can the school use technology for management, learning and communication? Can the school personalize its offerings and measure outcomes using technology?

One dimension to consider is the design of physical spaces for rich and diverse educational experiences, including space for oral discussion, project work (creations in art, science, etc) and performance. Learning opportunities can be extended by considering virtual spaces for simulations, role playing and networking.

The learning environment can be developed so that it supports learning in and out of school through such options as leveraging technology to extend the classroom, community service and work internships, and by involving community members as mentors and coaches. In this way, education is unconstrained by time and place. The good news is we already have many of the transformative solutions that we need. It is now the time to accelerate adoption.

- 1) Moving to the cloud – Keeping in house systems up to date is both expensive and time consuming allow your IT staff and teachers more time to work on things that matter in the classroom. Cloud Computing lowers overall costs, increases access, and provides scalability and elasticity to the delivery of educational services
- 2) Do more with communication and collaboration – through communication services like the Office 365 service you can offer your students and teachers new ways to collaborate online through voice, video, documents, and many more rich and powerful ways. This also gives you the basis to establish a digital identity for your students that can empower among other things powerful analytic systems that are key to change. This is a complementary service that Microsoft offers to education.
- 3) Manage key relationships – provide end to end student, vendor, and facilities management with relationship management software. Software like this can provide very good insight into the reams of data that an education system produces and identify things before they become problematic or systemic.
- 4) Increase insight and data visualization – Intuitive, Interactive dashboards delivering relevant views of information at the right level of detail make it easy to identify and remediate struggling children and can help inform on how the school system is performing as a whole
- 5) Embracing new technologies such as mobile computing and natural user interfaces. New, lightweight, portable, devices are coming onto the market at an alarming rate and more intuitive and natural user interfaces can help bring education closer to home. Imagine using Kinect to watch and interact with your classroom or help an child with accessibility issues or opening up the classroom through your laptop, tablet or mobile device from anywhere at any time.
- 6) Unlocking new and rich media types through apps – make textbooks come alive or check your national standards on the fly from your device anytime and anywhere. With the thousands of educational apps that are coming online in short form there is a limitless amount of material available to educators to engage and delight their students.
- 7) Integrate technology training into curriculum to produce workforce ready students. Programs such as IT Academy from Microsoft provide the curriculum necessary for students to graduate and step into the technology jobs that the job market is demanding.

All of this is possible today in 2013. By looking at what is currently possible in the technology landscape we can make large systemic changes in education that will increase educational outcomes for all.

“Emerging technologies and approaches in online education enable all instructors to practice what the very best teachers have always known: that students are enabled or limited by their

prior knowledge and that the fine art of teaching involves discovering the multiple pathways that will move students from where they are to the desired learning outcomes.” (Matthew Prineas, 2011)

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## Open Apps for opening up school education

Giles Pepler

*The development of open apps offers a route towards unlocking the untapped potential of school education and realising the potential of Open Educational Resources.*

**Preamble:** This short paper draws on the inspirational views of David Broster<sup>42</sup> in his Vision Paper for Lifelong Learning. The scenario he presents is equally applicable to school education as the first stage of lifelong learning; this paper embraces his vision, develops one of his main ideas and examines the barriers and enablers that need to be addressed.

**Pedagogy has changed only slowly and technology has not transformed school education as much as its enthusiasts would like to suppose.** Most pedagogy has changed slowly, if at all, in the past fifty years. When I started training as a secondary school English teacher, the inspirational text book I was directed to was *The Disappearing Dais*<sup>43</sup>. More than 45 years later, the dais has scarcely disappeared from many secondary school classrooms. Many of them are still laid out in the same way as the beautifully preserved lecture rooms at the Universidad de Salamanca, though they may be less ornate and austere. Whilst group work and project work is more common than it was (though there are moves by some Ministries to limit this), the flipped classroom remains the province of enthusiasts and shows no real signs of becoming part of the pedagogical mainstream. In spite of developments in teacher training, many teachers still perceive themselves as the dispensers of knowledge, more than the facilitators of curiosity and creativity, intimidated by the awareness that their charges, in primary as well as secondary education, may well be more conversant with and skilled in the use of mobile and web technology. Whilst there has been considerable development of OER in higher education, there is little evidence so far from the POERUP project<sup>44</sup> of extensive use in school education and this also appears true for the virtual schools described in VISCED<sup>45</sup>.

**There remains a disconnect between conventional schools and their curriculum and the demands of external stakeholders.** In many European countries there is a continuing divide between the prestige of 'academic' education and the lower status of 'vocational' education and training. Inertia in the curriculum is fuelled by the conflicting demands of business and industry and parental pressure. Business leaders often argue that schools and colleges do not produce appropriately literate and numerate young people who are 'fit for work'; yet the very personal attributes they profess to value, such as teamwork and creative collaboration, are constrained by the demands for individual assessment and conventional

<sup>42</sup> Broster, D. 2013 Reflections on Open Education Interview , Amsterdam 28th March 2030. Retrieved from <http://blogs.ec.europa.eu/openeducation2030/files/2013/04/Broster-OE2030-LLL.pdf>, 25th April 2013

<sup>43</sup> Whitehead, E. 1966 *The Disappearing Dais*

<sup>44</sup> see <http://www.poerup.info/research.html>

<sup>45</sup> see [www.virtualschoolsandcolleges.info/](http://www.virtualschoolsandcolleges.info/)

accreditation. Parents tend to remember their own primary and secondary education - often with somewhat rose-tinted spectacles - and do not readily support the development of non-traditional curricula. Their offspring may make extensive use of mobile technology and the web for social purposes and gaming, but this is perceived as separate from, and sometimes inimical to, the demands of education.

**Young people make extensive and increasingly sophisticated use of mobile technology.**

In many European countries the majority of primary age children own a mobile phone, of at least 3G capacity and for some using 4G technology. They use their phones extensively for social and pleasure purposes, whether texting, using free apps to access social networking sites and games and taking photographs and transmitting these - again using free apps. They may also have tablets, and as the latest generation of tablets becomes lighter and more compact, these are equally mobile as phones. Whilst the camera function of mobile devices has been increasingly used in primary and secondary schools, the increasing number of free apps has been relatively little exploited in an educational context. The largest mobile learning development project in the UK (and probably in Europe) - MoLeNET<sup>46</sup> - operated in further education colleges, but its **catalytic** effects are equally applicable in primary and secondary school contexts. This demonstrated the potential educational impact of mobile technology some ten years ago and the extent to which young people could use their mobile devices not just for social, but also for creative educational purposes.

The scenario described by David Broster envisages the development of three new tools, each with different functionality, but between them creating the conditions for a new educational paradigm. Whether accompanied by advertising or not, tools such as these are likely to be part of the technology landscape well before 2030. If the tools are there as accessible apps, primary and secondary age pupils will use them.

**What will make policy makers engage with the potential of open apps and mobile technology?** The **pressures** of conformity and inertia remain strong. However, if the educational outcomes of pupils embracing open apps - and using them to access OER - demonstrate that dramatic learning gains are the norm, then policy makers in individual countries will find it impossible to ignore this. The economic arguments for increased levels of educational attainment across Europe will be stronger than ever, given the expected growth of the tiger economies of emerging world economic powers such as South Korea, India and Brazil - let alone China. If pedagogical arguments alone are insufficient - and the history of the past 50 years suggests this is likely to be the case - it is probable that the economic imperatives of survival will tip the balance towards the development of a new educational paradigm.

There is currently a growing trend in several EU countries to open up the regulation of schools to private sector involvement and a range of new organisational models are emerging - free schools in Sweden, academies in England and a small, but growing number of virtual schools across Europe. Whatever one may think of the politics of creating a schools 'market', the emergence of new players and private sector involvement is likely to create increased pressures for change, which will spill over into delivery models and eventually return to impact on the policy makers who have facilitated this growth of diversity.

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<sup>46</sup> see [www.m-learning.org](http://www.m-learning.org)

**Towards the Handheld Primary School.** In his recent vision paper for UNESCO<sup>47</sup>, Professor Paul Bacsich presents the Handheld Primary School as one of five archetypes for future delivery of learning. The Handheld Primary is characterised by the pervasive nature of mobile devices: each pupil gets a handheld device (with age-related capabilities) and teaching and learning are focussed around these. With the use of open apps and access to a wide range of OER, the nature of teaching and the relationships between teacher and learner are changed. The model is equally appropriate for provision that is fully funded by the state, or provided through low-cost fee paying schools. The Handheld Primary provides a focus for socialising children into appropriate professional use of technology and open apps provide the platform for developing creativity and curiosity, creating demand for OER and raising levels of attainment.

If this archetype can be effective at primary level, then why not at secondary level too?

**Concluding words.** The second half of the twentieth century and the first decade of the twenty-first have been **characterised** in Europe by hand-wringing about the limitations of educational attainment by school pupils, false dawns through perceived elixirs (not least that technology alone could be transformative), and relatively little real change in pedagogy. The convergence of the development of open apps, OER and economic imperatives may just be the cocktail that finally produces the step change and paradigm shift that we urgently need to make school education creative, liberating and fit for the needs of both the economy and society.

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<sup>47</sup> Bacsich, P. 2012. Alternative Models of Education Delivery. Retrieved from <http://iite.unesco.org/pics/publications/en/files/3214709.pdf> on 25th April 2013



## **Visionary Learning in 2030: Secondary Education**

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<http://www.porto.ucp.pt/projectos/kidzlearn/>

*This is the time! Bringing opportunities to visionary teachers to deliver an 'open education' to all students based on technology, enhance students' choice and meet or exceed learners' expectations*

**Introduction:** The rise of high tech devices boosted innovative practices in Secondary Education by transforming traditionalist lessons in “open learning windows” using digital resources, new learning cultures that provide real-life experiences of teaching and learning. By opening curricula to mobile devices, teachers changed attitudes and strategies to benefit students on developing open and autonomous digital learning choice and creative and personalised skills.

ICT and Internet are a principal topic in the communities of education and training – the idea of increasing students' ICT-based activities during lessons in Secondary Education and as consequence learners' digital competences.

Rather the final EU report “**Survey of Schools: ICT in Education on use and attitudes to Technology in Europe's Schools**” published recently, demonstrates that teachers are not using frequently ICT for learning in the classroom.

Teachers training and sufficient equipment in schools added to bring your own device (BYOD) could change ICT practice in teaching and learning. Both students and teachers in Secondary Education must use ICT in all subjects, both in and out school and for complementary activities. Thus, I would suggest three key visions:

1. Creating a European Open Education community towards collaboration and mutual support.
2. Creating a European team of innovators (experts) providing teachers massive online training (coursera), helping to reboot and made the necessary changes to get every student into school and learning.
3. Rethink European School Curricula to connect learners to new experiences of education in the digital age, adapted to the specific needs of each country, fusing disruptive technology approaches, creative resources and good tools that any educator would be able to use to help learners achieve their full potential.

The emergence of digital learners had major potential implications for Education. Young students don't remember life before mobile phones or tablets. They were the first generation that play, think and learn through technology. So they were completely open to use devices and much quicker to integrate them into their lives and school education. Educators “rebooted” and are making the necessary changes on strategic approaches to technology in learning landscape to prepare students for the challenging jobs in the next 20 years.

Education can not be anymore bound by the limits of the teacher, textbooks, or the reference books of the school library. It will not be limited by the doors of the classroom. Lectures will definitely migrate outside of brick schools. Digital libraries will be open to schools, teachers and learners from anywhere at any time. Education will become increasingly mobile because students will carry definitely their school “in their pockets”. Bring your own device (BYOD) will be the day to day reality in school education. Primary and Secondary education will completely develop into “mass” and “universal” systems.

Producing, classifying and interacting with media will become more important to learners than passive tasks of searching, reading, watching and listening. Digital learning has finally the potential to reverse the backward trends of education.

More important than strict curricula, open education using disruptive tools and digital cultures will reach students interests and openness to work on their own learning, improving skills as autonomy, critical thinking, expertise, creativity, using new approaches to curricula that will help them achieve their full potential for new jobs.

The educational value and quality of digital resources and social media provided will not be so much in the content, but in teaching and learning. This will release the educator, (tutor and/or e-facilitator) from the tyranny of content.

The educator will be a facilitator or e-facilitator providing learners support, an e-tutor collaborating with students in virtual learning. Still, students will appreciate the support and collaboration they will receive with this model.

Open learning cultures will provide definitely the strategic opportunity to improve the quality of education as well as will facilitate dialogue, knowledge, sharing and capacity of building.

There will a plurality of possible understandings of ‘digital culture’. But despite such conventional observation, debates about digital culture did tend, for now, to have cohered rather firmly around three central and interrelated issues:

- access
- interactivity
- authenticity

Open learning cultures will enable teachers and students to challenge the ‘status quo’ in the sense that ‘credible quality’ content will no longer always be in peer reviewed journals, articles and academic sites, but will instead be on experimentation and conclusions in teaching and learning.

Visionary projects-based in Education will require teachers and students to be able to work with disruptive learning and technologies both in and out the school. Fielding trips are often a integral part of the success of such projects, and greatly benefit students’ learning by allowing them to engage with real-world environments.

All this aims will create a scientific quality on teaching and learning environment using an appropriate combination of different digital learning, tutorial support, peer group discussion, and practical lessons.

**Inclusiveness:** Bill Gates said in a ‘visionary’ insight (2010) that “the best lectures in the world would be found online and for free in five years time”. The innovative educators knew he was right. Some educationalists were already sharing for free some good open educational practices online in School Education.

Today’s technology will allow students, individually, accelerate or take their time, rather than having to wait for the class-group or struggle to keep up interested on learning. As a result,

teachers can take much more one-on-one approach to instruction, and individual students needs get more attention.

Online learning will permit any student anywhere any time to have access to a world-class education. Connected, equitable, social learning will be the great equalizer, the most public of public schools.

**Creativity:** Open learning cultures facilitated by disruptive technologies will hold the possibility of reimagining the experience of Education leaving the model that has been around in middle and secondary institutions for the last century. The use of technology starts with good teaching. Technology will have evolved by 2030. Gradually, educators will realign to fill the new different roles by trends in lifelong learning or roles they will invent themselves with enthusiasm to share creative learning. Modeling the skills and excitement of being a lifelong learner and reigniting flames as needed. Great educationalists will use the power of technology to do even greater things with their students.

**Assessment:** The assessment of the digital learning will urge to be done in order to analyse the learners using media in „formal“ learning, or informal learning (after school) and distance learning, to understand students‘ expectations and attitudes, to give students the skills to face the "new ways of learning", using opening learning contents and open educational resources.

The open learning method selected will be the most desirable in terms of educational objectives of real construction of learning, promoting cooperation, communication and reflection and constraints and expectations of the learners‘ success. It will take place in different contexts, situations, and it will not be provided by a single learning provider.

The educational objectives will be achieved when the students use the open learning resources (in and around the curriculum), in the classroom and/or at distance education with autonomy, creativity by developing and encouraging “innovative mindsets”.

### **Discussion:**

Armellini wrote in 2012: “The discussion needs to focus on how people teach and learn their needs and the choices they make.”

Using digital learning has been an efficient way of helping to bridge the gap between formal and informal learning. Open learning cultures were very useful supplementary resources for existing students and new informal learners.

Different media had different educational effects. Teachers might always do different and often better teaching by adapting it to the media. Students are more productive with the introduction of disruptive ICT in the classroom. That way, students will learn more deeply and effectively.

By providing relevant and current contexts, good tools, and interesting digital resources, Education will be moving from being purely academic, to where “gen-wired” might connect ‘new’ curricula (in and around), formal learning (who knows) and informal learning (alone or peer-support ) to its own life, interests and academic achievement in a lifelong learning perspective.

Additional to the school subjects, educators will need to focus their proposed projects on things that might help improve students‘ educational experience by helping to build autonomy, apply skills and knowledge to new situations, analyzing information, comprehending new ideas and ensuring they learn to self-direct and engage in critical reflection. Skills require opportunities for practice and development. It is important to empower students as valuable contributors to their own learning.

The teacher will be definitely a facilitator face-to-face and/or virtually, providing learners support, humanize the digital learning, and an e-tutor collaborating with students learning online.

Training new teachers must not be forgotten. Young teachers are the ones who reveal more informatics skills, but the domain of simple technique does not guarantee that teachers use it easily, with clairvoyance and expertise. Massive online training roadmapping would support the big challenge of training teachers in Europe.

### **Conclusion or some thoughts:**

“Open learning cultures can bridge “the walled gardens” of the school education with the worlds outside” Attwell wrote in 2008.

Students deserve every opportunity to learn and succeed. By gaining skills in ICT from a young age and learning to steward it responsibly and in its proper place, digital learning will prepared students to join the 21<sup>st</sup> century workforce and academic world in 2030.

I ‘followed’ the first “digital born generation”. Fascinated, I could experience students’ full participation and excitement by introducing digital resources in the classroom (in and out school). My open pedagogical experience (2001) was with my own project of e-learning based on learners’ observation and study. It gave me the joy of being a utopian educator who practiced with passion the inclusive learning success (poor learners and gifted learners) working together in the classroom and online. Technology could underpin learning by making it more relevant, personalized and creative. As Andreas Schleicher said on TED Talks, 2013, “learning is not a place, it is an intimacy”. Educationalists talk often about standardize, assessment, but less about passion. Education needs passion.

No doubt! Teachers and schools, but most of all teachers will continue to take brave risks to innovate, to create educational opportunities for a mass audience. Teachers will continue to experiment with their students. It is the only way to find what works in our next context.

As long as teachers will keep the assessment criteria in mind they can be as experimental as they wish.

Educators should be aware with these things and pedagogically well educated to have the ability and passion to motivate pupils and to offer them the best opportunities in versatile learning approaches and good methods. Excellence in teaching will be at the heart of our learners’ experiences.

The feedback of experimentation made by teachers and students will have an enormous impact. Teachers need to be sure they have the students’ best interest in mind, not just the bottom-line. Quality is a value of the digital resources and how they are linked to learning. The assessment of open education and digital learning will always be crucial to teachers and to learners. Not to do it, can completely change the pedagogical aim. And induce the failure of the educational background of the students.

Training teachers must be on the first line by supporting and expanding their skills and knowledge. It will be always difficult to feel and act as partners and not as teachers. In my own experience, and considering my trainee teachers, the happiest teachers with highest morale and sense of satisfaction in the job, are those who have been helped to develop a highly-attuned sense of technique in the classroom. Teachers must know with precision what they are trying to do and how they are trying to do it.

In 2030, like in 2013, it will be more appropriate not to work with answers but with questions. It will be more appropriate not to work with static content but to facilitate students



to create the digital content of their courses. Young people in schools will be treated as natural learners. School systems will hear the voice of their students, finally.

Teachers' attitude and 'open' methodology will raise a lot of interest and hopes for a new approach to school education because learners are bathed from birth in connecting technology. In a fast moving field like today's technology there are no best practices, only good practices and the need to continually invent better ones.

The "tech-born-generation" will be, among other things, accustomed to instant gratification and use of the web for extending friendships, interest-driven, self-directed learning and will be constantly connected, creating, and multitasking in a multimedia and participatory school.

The school system will continue to be reinvented to be accountable for what matters most. That means to practice captivating work-teaching, learning, and assessing in digital age.

Educationalists will see many new and fascinating educational tools emerging every day, and with them attempt to embed those digital learning resources in their everyday teaching practices. Education will become less dependent on courses, exams and degrees, and more on learners being linked, worldwide, to resources and to each other.

On 2010's, Economic crises in Europe brought a digital divide as a major issue for some developed EU countries' young people. 'New poverty' is clearly a factor in poor access to digital learning ICT and poor performance at school. Schools, and once more teachers and some best students could help to reduce this digital divide by volunteering attitudes at school.

Hoping the problems of equal access to education will be solved in Europe on 2030. It is encouraging to note that one of the key principles of European Commission is attend to find new solutions for Digital Education for all.

I hope that a great time will come in 2030 and will have a positive impact on Education but most of all on young students' lives.

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## **Critical influencers on education - how will these shape the schooling systems of 2030?**

James Stewart



### *Schooling in 2030 – still a growth industry?*

The rapid and relentless changes in technology and in the international economy will mean that during the next twenty years and beyond education will be a global growth industry, required to deliver the necessary expertise and new skills to keep all world economies competitive. By 2030 education will still be the main tool in changing or maintaining a nation's prosperity. It is unlikely that those who predict that the current system of schooling is "obsolete" will be proved correct. Schools will still exist as we know them now, needed not only for the socialisation and care of children during the day but also to manage and stimulate their learning. Conventional schools will also have the opportunity to address the wider needs of society for lifelong learning and the re-skilling of the community as new technologies generate the need for new skills.

This will offer opportunities for established schools to be entrepreneurial and to grow their business to deliver services nationally and internationally, through the development of resources, educational applications and massive open online courses (MOOCs), as well as at the local level.

It is likely that independent and privately funded providers will increase dramatically, some associated with large commercial organisations, some commissioned as philanthropic initiatives and others that are more local and community based. Multinationals like Walmart and Tesco, as well as Amazon, Apple and Google, may dominate this space.

Primary education will still require significant teacher pupil contact as children learn to manage their learning paths. A greater mix of state and private provision may emerge as new pedagogies, driven by the new technologies emerge. Teacher pupil ratios will rise with more use made of "para-teachers" and classroom assistants.

Second level education will be a growth business in the field of distance learning.

The availability of online education resources will be pervasive. This will be another growth area with virtual schools and digital resource providers like Khan Academy proliferating.

To prepare for this world existing schools will adapt by providing ubiquitous online access. Bandwidth, wireless access and flexible spaces to accommodate flexible pupil groupings will be the way forward. The focus on access devices will diminish as they become all pervasive.

Classroom practice and pedagogical models will have evolved to acknowledge the changing dynamic around information and data analytics. Access, by pupils, to information will no longer be teacher moderated. The emphasis of teaching will have shifted to information

sifting and the critical analysis of performance data to help manage and direct the learning paths of students.

Assessment systems will have evolved so as to acknowledge the new pedagogies. Their primary focus may still be on literacy, numeric and critical thinking skills but a “just in time” approach may become more prevalent as new skill requirements come and go.

Overall our approach to education will have become more flexible with the organisational systems deployed in schools becoming more fluid and less driven by chronological age. Older children will, more actively, manage their learning paths. Timetables will be more personal with emphasis on collaborative project based activities supported by satellite, skill enrichment options. Adults, as well as learning alongside younger students, will be learning facilitators and advisers.

Overall the “education business” will be a challenging and rewarding area within which to operate.



## Open School Learning

### **a vision to improve European schools towards 2030 – using the results of the Open Discovery Space project**

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*Open School Learning means engaging teachers, students, parents and policymakers to promote and realize more flexible and creative ways of schooling, through innovative scenarios, and sharing open educational practices and resources, using the unique approach for de-centralized and technology-enhanced communities championed by Open Discovery Space project.*

**Open Discovery Space (ODS)** focuses on the required modernisation of school education, based on the combination of **Open Education** and **Creative Classrooms** through the concept of **Open School Learning**. Open School Learning introduces and uses innovative scenarios, open educational practices and resources and can be realized through de-centralized and technology-enhanced communities. ODS cooperates since 2012 in a first of its kind effort with all school stakeholders to create a pan-European e-learning environment to promote more flexible and creative ways of learning. The project follows a unique approach to learning at school: supporting the development of self-esteem, an increased "sense of belonging", and an improved perception of one's own capacity to solve problems. In this approach, ODS addresses teachers as main target group and develops regional hubs, instruments and online services, which facilitate and improve Open School Learning and contribute to the "construction of the surrounding community".

### **1. The need for modernizing school education – the current situation**

There are currently numerous education reform initiatives in Europe as policy makers try to make schools more effective and provide students an education that prepares them for life in the 21st century. Schools are being asked to increase the quality of education, notably by providing more students than in the past with advanced skills and the ability to be flexible thinkers and problem solvers. These reform initiatives vary and include: programmes to develop educational repositories with certified content; professional development opportunities to in-service teachers, networked laptop computers for all students, classrooms with interactive whiteboards to help make lessons come alive; wireless Internet access points in schools; large scale ambitious plans to remodel schools and create learning environments which inspire all young people to unlock their hidden talents and reach their full potential;

21st century work places for teachers; and provide access to facilities which can be used by all members of the local community.

All these efforts clearly serve – at different levels – the vision of Re-Schooling, towards schools as "Focused Learning Organisations" and "Core Social Centres", that is dynamic establishments in strong cultures of equity and consensus about their value, which follow system-wide, root-and-branch reform. This vision was elaborated back in 2004 by the International Schooling for Tomorrow Forum (OECD, 2004)<sup>48</sup>. At the core of these reforms is an emphasis on 21<sup>st</sup> century teaching and learning in which eLearning and digital resources is not merely present, but is used in the most effective ways possible. In the OECD scenarios, schools are revitalised around a strong "knowledge" agenda, with far-reaching implications for the organisation of individual institutions and for the system as a whole. In the process of Re-Schooling (OECD, 2006)<sup>49</sup>, eLearning and Open Educational Resources (OER) are fundamental support tools to allow educational establishments to comply with their central social function.

## **2. Open School Learning - Towards a vision for the 2030 European schools**

By keeping the required integration and balance between learning innovation and well-proven educational approaches and designs, ODS promotes and realizes the concept of Open School Learning as the combination of Open Education and Creative Classrooms for opening up learning, contents and collaboration in the school sector to strengthen the learning of the students, the future citizens and finally the whole European society across all European countries and regions.<sup>50</sup> Thus, Open Discovery Space will support the vision of modernizing school education through Open Education and Creative Classrooms by technology-enhanced learning and online communities in particular by two major objectives identified as main requirements:

- Open Education: Improving the use of eLearning and Open Educational Resources
- Creative Classrooms: Developing a network of communities across Europe

### *Open Education - Improving the use of eLearning and Open Educational Resources*

The fundamental barriers for Open Education are not technical or financial factors, but psychological, organizational and cultural. Powerful methods for scaling-up and transferring pilot implementations and for evolving the public's conceptions of learning and schooling are essential to take full advantage of the opportunities new technologies represent. The project is attempting to add its contribution to these ambitious goals and visions, by designing and developing a socially-empowered portal that will highlight significant opportunities and challenges for innovation enabling a more effective exploitation of the rich but disperse educational content available in the digital repositories across Europe. The work will focus on the exploitation of the learning context characteristics that educational resources are using and will propose methods for classifying and relating digital educational resources with the learning context of use. The proposed scheme enables practitioners to understand and

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<sup>48</sup> OECD (2004), OECD Background Papers, International Schooling for Tomorrow Forum, June 6-8, 2004, Ontario, Canada.

<sup>49</sup> OECD (2006), Think Scenarios, Rethink Education – ISBN-92-64-02363-1 © OECD 2006.

<sup>50</sup> Stracke, Chr.M. (2012), "Learning Innovations and Learning Quality: Relations, Interdependences, and Future"; in: Stracke, Chr.M. (Ed.): *The Future of Learning Innovations and Learning Quality. How do they fit together?*, Berlin: Gito, p. 13-25. [also: [www.learning-innovations.eu](http://www.learning-innovations.eu)]

prioritize the challenges involved in the implementation of eLearning, design school-based change initiatives, and facilitates constructive dialogues and consensus building in the school community. From a content and pedagogical perspective, the Open Discovery Space learning environment will provide teachers with an access point to select resources (e.g., lesson materials, teaching plans) to support innovative forms of eLearning. The Open Discovery Space Educational Design will be based on the main components of Resource Based Learning: enabling contexts, resources, tools, and scaffolds. Taken together these components enable teachers to create and implement learning environments of considerable diversity and flexibility. The proposed methodology aims to optimise the use of learning content by linking supply-side (digital content and applications) with the demand-side (teachers, students and parents).

There are identified barriers to wide spread the adoption of OER<sup>51</sup>. Some schools have their own repositories and are disinclined to change them for new open repositories. The variety of European, national and regional OER repositories that have been started in recent years should be sustainable, both financially and technically. Therefore a funding model and a technical model are required for the repositories. A content model and a staffing model are also necessary<sup>52</sup>. The nature of contents is especially relevant, as long as proprietary formats can limit the adoption of ODS innovations. The staffing model has to be adapted to the actual schools that take part in the ODS experiences in the long term – bearing in mind that many existing structures may be indifferent to or even hostile to innovation and pioneering ICT innovations. The open and social federation of eLearning resource repositories of ODS can facilitate the required changes. The open access philosophy is based on open licensing modes for OER repositories, the use of open formats of eLearning resources, and their availability through open access protocols. The integration with social platforms can be helpful to foster the educational innovations that ODS teachers and schools will construct.

#### *Creative Classrooms – Developing a network of communities across Europe*

Although most of the European educational systems remain highly centralized, implementations of policies related to school modernization by innovation through online communities and technology-enhanced learning (often called eLearning) remain optional and allow for substantial discretion to the implementers, and for a "backward approach" leading to goal and role definitions in the field. In the light of such open-ended and general policies, practitioners at the micro level and local and regional communities of implementation they generate are crucial and critical for modernizing school education. ODS aims to establish and enhance such communities of implementation (a kind of community of practice). Communities of implementation will be regarded as self-reproducing, and evolving entities emerging within the school settings as a response to an externally developed policy. Various authors emphasize the importance of communities of practice for organizations (Lesser and Storck, 2001<sup>53</sup>; Wenger, McDermott, and Snyder, 2002<sup>54</sup>), and therefore communities of implementation are considered as a purposeful strategy for spreading innovations. ODS

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<sup>51</sup> D'Antoni, S. (2009), "Open Educational Resources: reviewing initiatives and issues". *The Journal of Open and Distance Learning*, Vol. 24, No. 1.

<sup>52</sup> Downes, S. (2007), "Models for Sustainable Open Educational Resources". *Interdisciplinary Journal of e-Learning and Learning Objects*, Vol. 3, pp. 29-44.

<sup>53</sup> Lesser, E. and Storck, J. (2001), "Communities of practice and organisational performanc", *IBM Systems Journal*, Vol 40, No 4.

<sup>54</sup> Wenger, E., McDermott, R. & Snyder, W., (2002), *Cultivating Communities of Practice, A Guide to Managing Knowledge*, Harvard Business School Press, Boston Mass.

promotes local awareness raising and appropriate content development and use. The development and the establishment of a decentralized network of nodes will build upon and extend the work of the community of practice. And perhaps, more importantly, nodes will operate in the local language and culture to stimulate and enable development and use of eLearning resources as befits local need. Although nodes may act largely independently, those active in the node will have experiences and resources to share with the Open Discovery Space community, which will remain active as a platform for on-going interaction at the international level.

### **3. Conclusion: Reflections on the School of 2030**

Our vision on the future of modernizing school education through Open Education and Creative Classrooms in 2030 is to facilitate Open School Learning, seamlessly by engaging all stakeholders and meeting the new challenges faced by EU, including economic and social threats. Open School Learning provides many advantageous characteristics:

- **Innovation:** Open School Learning will be innovative offering the best mix of different learning designs including e. g., inquiry-based collaboration, group work, online collaboration and communities but also teaching in front of the group if appropriate.
- **Policy:** There will be uniform, common, and at the same time locally adaptable educational policies across EU.
- **Quality:** The school systems will provide quality education at global level: Instead of classical lesson- and subject-oriented education the school education will be based on tailor-developed and adapted learning scenarios that can range from short units to overarching group work during several days and more.
- **Engagement:** Open School Learning will engage all stakeholders: The role of teachers will change to a mixture of facilitator, moderator, tutor and of course traditional teachers depending on the best approach and solution for the given situation and learning objective to engage the students.
- **Creativity support:** Open learning will enable creative thinking, competence and skill development, as well as creation of new knowledge in the classroom, transforming the school into a truly creative learning environment which is risk taking, open, and ever-improving and adaptive (to individual learners, local community, and social context).
- **Accessibility:** Educational materials of the highest quality and of new capabilities (highly interactive and learners' immersing and engaging) will be accessible seamlessly *to anyone at any place and any time*. Top-spec smart and personalised mobile devices, and high-end technology in general (including next-generation broadband internet access), will be mainstream and accessible for *use and ownership to anyone at any place*, to support seamless learning inside and outside of the school, as well as new - more effective and valuable - forms of learning, with active collaboration of the parents and the engagement of the local community.
- **Seamless learning:** Providing seamless integration between school- and home-based learning activities, providing a seamless learning experience for the students, supported by both teachers and parents. 'Seamless learning' occurs across formal, non-formal, and informal 'collaborative learning' settings activated in and out of the

‘connected’ school of 2030<sup>55</sup>. Seamless School also includes the notion of ‘seamless integrated formative assessment’, which promotes self-awareness of learning path and achievement for all students, by means of new, formative forms of assessment capable of assessing new competences.

- Rich data for learning and decision support: The collection and processing of rich data on learner and teacher activities will provide useful information for learning, assessment and pedagogical decision making<sup>56</sup> (see TEL-Map School roadmap recommendations [www.learningfrontiers.eu](http://www.learningfrontiers.eu)).
- Interoperability: OER will be interoperable with all systems, devices, technologies, standards and languages.
- Adaptability and usability: OER will be adaptable, easily useable and portable.
- Sustainability: Open School Learning will be sustainable economically and technologically using modern school and education models and technologies.
- Social responsiveness: Open learning in 2030 will meet the societal, socio-economic and market demands and provide equal education opportunities to all EU citizens, minimising social inequalities. High quality learning and education will be a freely available public good for all citizens.

ODS provides a gateway for the realisation of our 2030 Vision for Open School Learning:

The large-scale implementation of Open Discovery Space<sup>57</sup> ([www.opendiscoveryspace.eu](http://www.opendiscoveryspace.eu)) aims to support the mainstreaming of eLearning in the EU Member States in school education and make a substantial contribution to major EU initiatives, including Digital Agenda for Europe (mainstreaming e-learning), Opening Up Education and Up-scaling Creative Classrooms in Europe. In the field of compulsory education, we believe that ICT can offer schools unprecedented opportunities to improve teaching and learning for students of every age. To date however, and despite several actions to harness this potential undertaken at EU and national levels over the years such efforts have suffered from fragmentation and short-termism.

In the near future such solutions will form part of the basic infrastructure of schools, which will be transparent "resource centres" open to the community, operating under a management structure geared to organising teaching and learning activities for and with the community. And in the distant future, ICT will most probably be used in radically different ways for everyday school activities, underpinned by the use of ubiquitous devices for developing structured curricular activities, sophisticated environments for remote collaboration and creative activities, and continuous seamless virtual presence of the learners and teachers in a highly dynamic, synergetic and collaborative educational nexus.

Thus, the classroom of 2030 will be a 'blended learning space' (made of physical space and virtual space), woven up together through technologies such as augmented reality, gesture-

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<sup>55</sup> Taken from the definition of the TEL-Map School Roadmapping Group. [[www.learningfrontiers.eu](http://www.learningfrontiers.eu)]

<sup>56</sup> See TEL-Map School roadmap recommendations. [[www.learningfrontiers.eu](http://www.learningfrontiers.eu)]

<sup>57</sup> Policy Support Action “Open Discovery Space: A socially-powered and multilingual open learning infrastructure to boost the adoption of e-learning resources”, funded by the CIP-ICT-PSP-2011-5, Theme 2: Digital Content, Objective 2.4: e-learning Objective 2.4, 1/4/2012 – 31/3/2015, with a consortium of more than 50 partners across Europe.

based, cloud and mobile services. Individual profile will contain life-long story-telling data, which can be used to negotiate the learner's learning and can be shared with others. Learners will have access to distributed learning material (open repository of knowledge), a resource that will be shared by many other institutions. Teachers and learners will be co-creators and pro-sumers of learning resources.

Open School Learning will modernize school education by opening up education for the future generation of students and for all communities and societies across Europe.





## Online Curriculum Courses in Secondary Schools

Andreea D. Suci

*In 2030 on-line courses are the best format for the secondary school education.*

### THE BEGINNING OF THE ON-LINE COURSES FOR HIGH SCHOOL STUDENTS

The epiphany of 2013 revolution in learning began with the questions: Why use Internet just as an auxiliary resource for learning? Why not use the Internet as a cost and time saving efficient means of conveying knowledge in secondary schools all around Europe? Back then, the model was already used in universities, where long distance courses were available. As it proved over the last 15 years, high school students benefitted largely from such courses on so many levels: they were able to learn at their own pace, they could revisit the teacher's lecture and notes, they had more time for experiments, blended learning, informal and non-formal approaches to teaching provided by motivated teachers. And let us not forget one of the main gains of on-line education: as the generations of students were being more and more digital, they found that such a course was more appealing and natural to them than a traditional pen and paper one.

### UP TO 50% OF THE CURRICULAR COURSES ARE ON-LINE COURSES

In the beginning, i.e. in 2013, each school produced a 10 per cent of their courses on-line, as part of a European pilot programme. This per cent was gradually increased up to 50 per cent. A good balance between on-line courses and face-to-face courses was established. An educational platform in each school permitted teachers to produce their own courses, assign homework, communicate with students, and offer feedback. Especially in remote areas where students had to travel 20 km or more to go to school, a simple tablet with Internet access solved the problem of time and costs efficiency.

### ON-LINE COURSES OFFER SECONDARY SCHOOL STUDENTS MORE TIME TO GAIN PRACTICAL EXPERIENCE

Having all the theoretical information available on the on-line platform teachers concentrate more on practical methods of learning: experiments, seminar work, informal and non-formal learning. For vocational schools this also meant more time for students to gain experience by actually working in firms and companies at their choosing. For normal secondary schools the 2 days off school per week allows students to work a part-time job and thus gain some financial independency and also put some money away for college. The work experience they acquire also boost their CVs and employability rates. So, after more than 15 years of fully using the *on-line course system for secondary students*, the whole world sees the prophetic vision that Europe had in 2013 and began applying it to their own systems.

## **CONCLUSIONS**

In 2030, using the Internet as a means of conveying knowledge is just the natural thing to do. Historically speaking, the learning systems always incorporated the latest “technology” into the learning/teaching process. First, there was a stick and some sand where teacher and students could write and draw things; then came the wax table and the stylus, then some chalk and a blackboard, pen and paper and now, finally, it is time for the “virtual pen” to enter the scene. Thus, the new generations are more and more digitally proficient and willing to master their learning, to dictate their own pace of learning and to gain practical experience by working in real companies.



## OER as basic and renewable public and commercial knowledge resources in 2030

Aleks Tarkowski and Kamil Śliwowski

*By 2030, public educational resources will be treated as a common good – just like natural energy resources. Even if the publishing business, as it currently exists, will not last until 2030 because of the disruptive effect of the OER model combined with the spread of cheap digital technologies, OERs will last. And as a common good, they will form the basis for a market for publications and other services based on free and open resources – the way there is a market for the collection and distribution of energy based on natural, renewable sources of power.*

As national programs of open educational resources (OER) creation grow strong in the beginning of the second decade of the 21st century, we can easily imagine how their potential will be used even if the current programs will shut down and change before 2030 – this is the faith of most public ICT programs, that fail in the long term to adapt to the pace of technological and civilisational change. The difference with regard to OER is the open publication model itself, which provides sustainability of the basic resource despite possible failure of products and services built on top of such „raw material“. This is similar to the way free software functions. Comparison can also be made to other goods that have the characteristic of public goods – such as air or water, which can serve as renewable energy sources and both provide “free” energy and sustain a commercial industry dealing with its collection, sale and distribution.

Open resource sharing models have been an escalating trend in science, education and culture for last ten years. This year marks the tenth anniversary of the Budapest Declaration on Open Access (Open Access)<sup>1</sup>, whose signatories formulated a program to ensure openness (accessibility and usability) of knowledge in the form of scientific publications. This declaration is treated today as a standard document for setting out the objectives of an open model, also outside the realm of science. The other key document, The Cape Town Declaration in 2007, formulated the precise goals for open education. It has been followed up last year by the UNESCO Paris Declaration<sup>2</sup>, which confirmed the global standard for Open Educational Resources. The declaration proclaims in particular that the state should promote openness of publicly funded educational resources, ensuring benefits for citizens as well as widely understood increases in the return on investment into educational resources.

Opinions that massive adoption of open resources will become killer competition for commercially produced resources seem common sense, but are in fact erroneous. They do not take account of the fact that the commercial entities can benefit from Open Educational Resources. An analogy here can be made to the exploitation – including its commercial forms – of what is traditionally perceived as commons resources: water, air, wind. The general argument about similarities between physical public goods and digital „new commons“ has been made by scholars such as James Boyle<sup>3</sup> and Justyna Hofmokl<sup>4</sup>. If these resources are treated as free "building blocks" of raw material, one can on their basis build added value in the form of products or services. This argument is well understood in relation to energy and other physical resources but is still controversial when made in relation to non-material

goods. In the case of educational content, freely available basic content can for example serve as basis for premium materials (enriched with multimedia content), for courses taught on the basis of the content (where users pay for the service of being taught, and not simply access to content), or for distribution – for example for publication in print of content available only as digital in its raw form. Furthermore, mobile telecom operators and producers of mobile equipment (smartphones, tablets, e-book readers and future iterations of such equipment) can distribute hardware with pre-loaded free content, which increases the use value of the equipment with minimal costs on the part of the producers. There are many other – often more advanced – scenarios of such added value creation, based on the general concept of a freemium model: in which business activity is possible on the basis of freely shared resources.

The underlying rationale for critique of open educational resources is the belief that such resources are unfair and fatal competition for the market. But research proves that this is not the case<sup>5</sup>, with many examples of the common occurrence of these two as alternatives: public transport and taxis, public highways and toll roads, public television and private broadcasters, libraries and bookstores, public schools and private schools, and finally, educational materials and teachers' resources. In each of these cases, the state succeeded in creating a regulatory model in which on the one hand the market is not destroyed, and on the other there is a public option available. Such a system should also support e-textbooks and other educational resources. In order to understand this ecosystem, one should in particular distinguish between raw materials and primary resources on one hand, and manufactured goods and services on the other. Despite the availability of basic resources one can create market for services and resources processed in "premium" ways of their creation, usage experience and distribution.

Around the world today there are several business models based on OER's. There is also basic evidence that commercial activities may increase the reach and impact of open educational resources. This suggests that there is a reinforcing mechanism that works both ways between public resources and market-oriented activities. We can start with the report prepared by Graham Vickery for the European Commission<sup>6</sup>, which outlines the case for economic potential of the use of public resources. Vickery argues that public resources for education, scientific and cultural heritage available to the public, have potential market and non-market uses, and also serve the goals of commercial production. This is the case for emerging services and educational start-ups like boundless.com, unglue.it or even the premium search services offered by Pearson, the biggest commercial educational publisher.

It is worth mentioning at this point that added value needs not be created by purely market forces. The internet and digital technologies have greatly increased the effectiveness of non-market production, described by Yochai Benkler as social production in the „commons based peer production model“. This is the case of many open educational initiatives, starting with Wikipedia and evolving over time into school-level educational projects, with the Khan Academy being the most famous one. Social initiatives often face the challenge of long-term sustainability and coordination of effort and are thus characterized, like most open initiatives, by a high rate of failure. At the same time sheer number of such initiatives means that even the few that become successful in the long term offer a vibrant ecosystem of educational resources and services.

In Poland, the Ministry of Education has launched in 2012 the „Digital School“ initiative<sup>7</sup>. The program follows a series of programs based almost solely on the provision of equipment to schools – and differs from them by virtue of being a complex program consisting of four segments: e-school (infrastructure and equipment for schools), e-teacher (teacher trainings), e-student (ICT equipment for students) and e-resources (creating open textbooks, redesign of Scholaris, the national platform for educational resources, and production of ICT tools for school management). As part of the program, atomic textbook resources (textbooks and

multimedia) will be published under a Creative Commons Attribution – Share Alike license. 18 free textbooks made with public money and with a formal review by the Ministry of Education will remain available as public resources even if the broader program will end without success and continuation (as many similar „ICT for school“ programs in Poland and other countries did before). The „Digital school“ program, considered by many experts as an exemplary national-level OER project, offers an example of a new form of resilience of educational resources offered by the OER model.

Observing the current growth of OERs and taking into account the specificity of a production model, in which relatively few (to name, for example, Salman Khan) can provide a high quality resource to many, we may assume that by 2030 at least standard educational materials will be a basic, publicly available resource. Charting of educational shifts caused by such a shift from a current condition of scarcity (at least in some regions) or barriers (mainly economical) is a task beyond the scope of this short text. But one can assume several crucial shifts happening, beyond the growth of a market on top of the open educational raw resources. This might include basic OERs becoming the simplest type of educational content, and self-study the most basic form of education. Students and parents – or state educational systems – would then invest fund to offer premium services or access to additional content. Secondly, the curation – or tailoring – of content to different individual, group or local needs will become a profession as important as current publishing professions. Thirdly, availability of OERs might increase the level of individual teacher activity – with teacher moving away from mass-produced commercial content they use today.

That is why state funded resources should be treated as a common good, just like natural energy sources. Both make sense only as renewable resources. Even if the current publishing enterprises will not last until 2030 (and most probably this will not be caused by the competition from OERs, but other factors), OERs will last. With them, there will be a market for content producers and distributors, and service providers – either new or adapted ones. Many of them, we cannot yet imagine today – the way no one has imagined MOOCs or the inverted classroom model. Thus an understanding of the functioning of OERs as basic, renewable, common goods is more important today than predicting the specific shape of OER products and services.

## Footnotes

- 1 Budapest Open Access Initiative, 14 Feb 2002, <http://www.opensocietyfoundations.org/openaccess/read>
- 2 Paris Open Educational Resources Declaration, 22 June 2012, [http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/Paris%20OER%20Declaration\\_01.pdf](http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/Paris%20OER%20Declaration_01.pdf)
- 3 *Towards an eclectic theory of the internet commons*, Hofmohl, J., International Journal of the Commons, North America, 4, oct. 2009, URL: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=470983](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=470983)
- 4 *The Second Enclosure Movement and the Construction of the Public Domain*, Boyle, J., Law and Contemporary Problems, Vol. 66, pp. 33-74, Winter-Spring 2003, URL: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=470983](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=470983)
- 5 *Economic implications of alternative scholarly publishing models*, Houghton J., Rasmussen B., Sheehan P., JISC, London 2009 and Comment to report in *Minerva's Owl*, Hall M. w Prometheus, Vol 28(1); 61-71
- 6 Review of recent studies on PSI re-use and related market developments, Vickery G., European Commission 2011.
- 7 Digital School national ICT and OER textbooks creation program in Poland, <http://www.cyfrowaszkoła.men.gov.pl/>



## The Open Community in the School of Today

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*Open Education uses established open-content networks such as Wikimedia to engage students, scientists, local communities and senior citizens in joint efforts to build and share knowledge for the solidarity-focused society of the future.*

*“Education is that which remains, if one has forgotten everything he learned in school.”  
Albert Einstein, “On Education”, 1936*

### Introduction

Europe 2030... after two entire decades of deconstruction, inhabitants of the old continent<sup>58</sup> are finally starting to smile again: the prospect of a United Europe is now being shaped in the way it should have been straight from the beginning.

It all started in 2010, when the “Troika”<sup>59</sup> set foot in Greece and encumbered the country with austerity and cutbacks, only to trigger a domino effect across all of Southern Europe. When the tiles started falling in the North as well, EU leaders finally realised that this Europe was not a happy place.

Luckily for them, a whole generation of young European visionaries – they were teenagers when the financial crisis tore down their dreams for years – are at hand to apply the lessons Europe has learnt from its first steps in the third millennium.

Needless to say, education has re-emerged as a priority: throughout the course of history, the passing on of knowledge has always been the key to building cohesive and competent societies. But how will it be done? Where will they turn to for inspiration, when funding has been so drastically reduced for nearly twenty years?

<sup>58</sup> “the old continent” refers to Europe: an expression not commonly used in English, but quite popular in French (‘vieux continent’) and Greek («γηραιά ήπειρος»)

<sup>59</sup> Troika = the “trilateral” group comprised of the IMF, ECB and EC responsible for “financial aid measures” to EU member-states in “bankruptcy.”



## Learning from Solidarity

The crisis led people to re-think their lives and re-address their priorities. Where all sentences would begin with an “I”, towards the middle of the ‘10s more and more people, driven by need, started adopting a “we” attitude. “My neighbour was fired and can’t afford to feed his kids. It’s him today, but who knows: tomorrow it could be me. I have to find ways to help him”.

But were all citizens driven by need alone? Back in the last years of the 2<sup>nd</sup> millennium, a certain small group of people started breaking boundaries. They were fed up with the commercialisation of nearly everything. “Is it possible that in the Computer Age, so many people are missing out on all the action not because they can’t afford hardware – prices are dropping by the day – but because every step they take in software is licensed with a price tag?” “Unacceptable” they thought, so they pooled resources and Open Source<sup>60</sup> was born. Anyone was free to legally use and further develop the software products that were freely released to the public, on condition that the work THEY invested into development was, in turn, made freely available to the public. The open-source philosophy attracted a great number of followers, communities and user groups were formed. Soon after, Creative Commons (CC) licences<sup>61</sup> further propagated the ideals of sharing skills, knowledge and creativity. Copyright is a thing of the past – after all, how profitable is your intellectual property when it’s available for anyone to see, listen to or eventually, steal – on the Internet? Why should a creator take on the role of ghost-hunter for violators to his copyright, when he can apply a CC licence to his work, i.e. become a sharer and earn profit from secondary sources? Soon enough, free and open content was gaining ground in all fields.

## Revolutionising “the sum of all knowledge”: Wikipedia

Knowledge was soon to follow suit. The free online encyclopaedia was launched in 2001 by Jimmy Wales with a mission; in the words of Wales himself, “*Imagine a world in which every single person on the planet is given free access to the sum of all human knowledge. That’s what we’re doing*”<sup>62</sup>. Over less than a decade the concept had spread to nearly all countries of the world, and the Wikimedia Foundation<sup>63</sup> boasted an “umbrella” of 12 free-knowledge projects.<sup>64</sup> With Google search rankings that the most profitable private enterprise would envy, Wikimedia’s success was based on volunteerism: one could say that one of the first manifestations of the term “crowdsourcing” – coined back then, now a household word – was the Wikipedia movement<sup>65</sup>. Volunteers from all over the world contribute their knowledge, under CC licences, to the building of the most up-to-date and comprehensive knowledge pool ever. Teachers soon became aware of the immense potential offered not merely in *using* Wikipedia, but more importantly, in *editing*. Wikipedia Education

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<sup>60</sup> official website of the Open Source Initiative (including definition) at <http://opensource.org/>

<sup>61</sup> Creative Commons mission and licencing info at the CC official website: <http://creativecommons.org/>

<sup>62</sup> Quote by Jimmy Wales (aka “Jimbo” to the Wikipedia community): [http://en.wikiquote.org/wiki/Jimmy\\_Wales](http://en.wikiquote.org/wiki/Jimmy_Wales)

<sup>63</sup> Concise info about the Wikimedia Foundation on its FAQ page: <http://wikimediafoundation.org/wiki/FAQ/en>

<sup>64</sup> List and description of projects at [http://wikimediafoundation.org/wiki/Our\\_projects](http://wikimediafoundation.org/wiki/Our_projects)

<sup>65</sup> According to movements.org, “Wikipedia, the open-source encyclopedia, is one of the best examples of crowdsourcing. Any user can write and edit entries on the site”. <http://www.movements.org/how-to/c/crowdsource/>

Programmes started sprouting in all continents<sup>66</sup>. K-12<sup>67</sup> teachers and University professors alike integrated contributing to Wikipedia into their in-class and homework assignments, with multiple benefits for all: school assignments are no longer “static” projects, soon doomed to oblivion in the information overload of our age; instead, they are dynamic content, online and open to correction and further development from day one. Moreover, students and pupils acquire a sense of belonging to a multilingual, multicultural, knowledge-based community; they effortlessly learn “netiquette” and collaborate constructively with peers from all over the world.

### Local content, global impact

But there were far graver issues at stake from 2010-2030. People were being laid off by the dozens. Unemployment rates sky-rocketed to double-digit figures, reaching in April 2013 an all-time high of 26.4% and 26.3% in Greece and Spain respectively.<sup>68</sup> Families could barely feed their children, let alone encourage them to study and pursue a career.

In 2012 a school from the island of Kefalonia, Greece was insightful enough to discern that the future would be grim for its residents. The island had a rich flora, which had generously sustained the locals during WWII. The working pupils and their teachers were already experiencing serious changes in their lives due to the crisis: with 30-40% cutbacks for those who had jobs, and a skimpy unemployment benefit for those who didn't, they realised that soon they themselves would have to turn to the “fat of the land” for their sustenance. So they started a school project in which they studied the edible species of flora around them, while turning to their parents and grandparents for guidance. “We said: we have to document their wisdom now that they're still around. In a few years it will be too late. Sometime in the future we'll be grateful that we did,” recalls Panagiotis, then an 18-year-old pupil of Evening Upper Secondary, now a father of three.

And so they set about their project: they photographed all the edible plants around them. They chopped, peeled, cooked, dried, boiled, preserved... and photographed again. They learned things about the products of nature around them that they had never imagined. Their newly-acquired knowledge was uploaded to a gallery in Wikimedia Commons.<sup>69</sup> For the first few years they would only turn to this knowledge when in need of a gourmet idea: natural, fresh ingredients are sought-after treats in their own right. Soon enough however, supplies got scarce and more and more people had to turn to ...“weeds” for dinner.



Panagiotis interviewed Mr. Aggelos Bozas, 82, about surviving off the wild flora during WWII.

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<sup>66</sup> Wikipedia Education Program homepage at Wikimedia Outreach: [http://outreach.wikimedia.org/wiki/Wikipedia\\_Education\\_Program](http://outreach.wikimedia.org/wiki/Wikipedia_Education_Program) The Foundation currently runs four programs in three continents, however there are Wikipedia education programs run by local Wikipedias as well, such as the [Greek](#) and [Italian](#) programs.

<sup>67</sup> A term designated for the sum of primary and secondary education (i.e. Kindergarten to 12<sup>th</sup> Grade according to the U.S. and other education systems).

<sup>68</sup> April 2013 statistics from Eurostat on Feb. 2013 figures: [http://epp.eurostat.ec.europa.eu/cache/ITY\\_PUBLIC/3-02042013-AP/EN/3-02042013-AP-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/3-02042013-AP/EN/3-02042013-AP-EN.PDF)

<sup>69</sup> “Wild Flora of Kefalonia, Greece” gallery at [http://commons.wikimedia.org/wiki/Wild\\_flora\\_of\\_Kefalonia\\_Greece](http://commons.wikimedia.org/wiki/Wild_flora_of_Kefalonia_Greece) (captions in English)





Screenshot of the wild flora gallery.

Other schools – but informal groups as well – soon caught on to the idea. In 2013 you could find only one gallery in Commons by typing “Wild flora of” in the drop-down search box. Now, in 2030, nearly every province of Europe has its own Wild Flora gallery, with inter-wiki<sup>70</sup> links to other language versions: the students and locals collaborated in gathering the material and building the content, but the information is available to the world at large. The knowledge they gained and shared helped them survive in the dark years of recession.

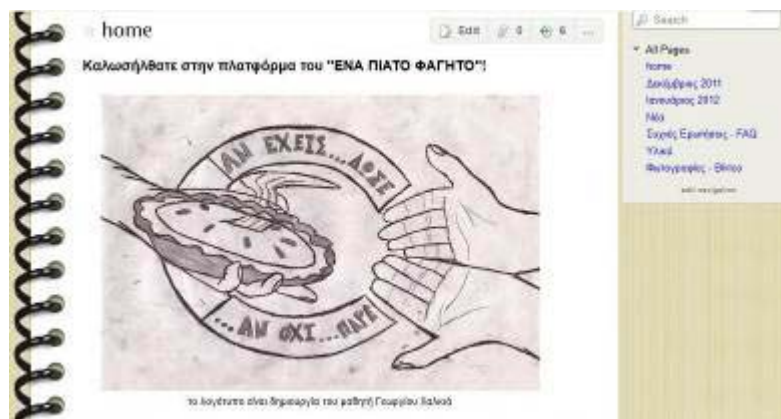
But that’s not all: it was shortly identified that “citizen science”<sup>71</sup> projects could be

linked up with scientific fields such as biodiversity, and forces were joined with the open-science **movement**<sup>72</sup>. **Soon enough, an endless stream** of crowd-sourced scientific data “formed a delta” with mainstream scientific research, with the support of experts, visionaries and open-access advocates.

The outcome? Trillions of bits of freely accessible data at the disposal of today’s aspiring young scientists shaping Europe as a continent of open research at the service of its citizens. In the words of 33-year-old Vicky, a post-doctorate researcher in Organic Architecture who has been studying flora and fauna for the past five years: “My research involves identifying organic forms that could inspire innovative architectural structures in terms of both form and function. I can’t possibly imagine how I would ever have managed to gather the information I need if I had to work in my parents’ time: first of all, I could never have afforded to have regular access to around twenty different journals! In a way, it can be said that the crisis led scientists of my parents’ generation to “let go” of their proprietary attitude. It didn’t make sense anyway: who am I to claim intellectual property rights on my research on the scarab beetle, when the insect has been roaming the Earth for millions of years?”

### Learning *with* Solidarity

On a different note, a year earlier – 2011 – wiki technology was employed by the same school in a different school project offering “a plate of food” to those in need. The students and their teacher built a platform for distributing meals to their fellow citizens who could not provide for their daily



Screenshot of the “A PLATE OF FOOD” wiki. The “logo” (designed by student G. Chalkias) reads: “If you can, donate... if not, receive”

<sup>70</sup> Interwiki linking is a facility for creating links to the many wikis under the Wikimedia “umbrella”. Instead of pasting in entire URLs, they use a shorthand similar to links within the same wiki (intrawiki links).

<sup>71</sup> Scientific research conducted, in whole or in part, by amateur or nonprofessional scientists, often by crowdsourcing [http://en.wikipedia.org/wiki/Citizen\\_science](http://en.wikipedia.org/wiki/Citizen_science)

<sup>72</sup> See Wikimedia Blog post at <http://blog.wikimedia.org/2011/07/20/joining-forces-with-open-science/>

sustenance. The philosophy behind the project was that most households then could either afford to cook an extra serving of food each day, or couldn't afford to cook at all. Was there a way to offer the surplus meals to those who needed them, in a way that was convenient and discreet for all? The students found a solution to the puzzle: all the meal donors would log on to a site by e.g. 11 a.m. each morning and register the meal they were offering. The project co-ordinator would log on an hour later, and "match" meals to recipients on the basis of a special dietary questionnaire.

The meals would then be delivered either door-to-door, or by the person(s) in charge of deliveries. They created all the necessary material and built a dedicated site at wikispaces.com<sup>73</sup>. The reason they chose a wiki over other options they investigated (a blog, or social media such as Facebook or Twitter) was dual: first of all, wikis for educational purposes were available "ad-free"<sup>74</sup>, which was a major consideration for the non-commercial nature of the project. Secondly, it had a Creative Commons licence "built in" to the platform, as all material at Wikispaces is subject to CC licencing: all they had to do is add "NC" to the default licence.<sup>75</sup> Moreover, the WYSIWYG<sup>76</sup> editor made editing the page "a breeze" even for those who were not acquainted with wiki code. The system was translated into other languages and adopted by a number of communities throughout Europe, as it was equally effective in a block of flats as well as in a small neighbourhood. It helped a lot of people secure their daily sustenance, while strengthening the ties of solidarity, compassion and caring in the societies involved.

## Conclusion

Schooling – especially in times of difficulty – cannot be isolated from the social setting in which it is established. Custom-built Open Education tools are fantastic, but the investments in terms of research, development and funding do not always reach all end-users. It is here that widespread open-content technologies such as Wikimedia can play the role of open-education platforms, with a "fringe benefit": *the educational output has a much wider outreach*. The work carried out by an innovative Greek school in times of recession – and there are certainly numerous similar schools all over Europe – can serve as an example of how readily-available open technologies, the wisdom of our senior citizens<sup>77</sup> and a mentality of solidarity can help build competent and essentially happy societies that transcend boundaries of language, culture and schooling qualifications. Europe, get ready for the open community of building and sharing knowledge for a better world...

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<sup>73</sup> The "Plate of Food" wiki is at <http://enapiatofaghto.wikispaces.com> (Greek only, English translation can be provided on demand)

<sup>74</sup> see "Wikispaces Classroom" at <http://www.wikispaces.com/content/classroom/about> (available free of charges and ads for schools and universities)

<sup>75</sup> The default licence for "Wikispaces" sites is CC BY-SA 2.0, we added NC (Non-Commercial). See licensing policy at <http://www.wikispaces.com/Creative+Commons>

<sup>76</sup> "What You See Is What You Get" (WYSIWYG) is the latest trend in wiki editing: the simple interface is quite similar to a word-processing GUI and free from "wiki" code, which could discourage a "newbie" from editing wiki projects. Such editors are being trialled experimentally in various Wikimedia projects. In the near future it is expected that the user will be able to choose between either a typical wiki editor or WYSIWYG.

<sup>77</sup> Engaging senior citizens in inter-generational projects is a concept closely linked with EU policies: 2012 was designated as the "European Year of Active Ageing and Solidarity Between Generations", and the EU has taken the concept a step further by linking it with the "European Year of Citizens 2013" via the "generations@school" initiative: <http://www.generationsatschool.eu/en/home?mini=2013-04>

### Notes

*The article may be imaginary, but the title is real: we presented a mini-seminar titled “The Open Community in the School of Today” at the National Hellenic Research Foundation on 17 December 2011. Read more [here](#).*

*I used a [free online tool](#) to create the “newspaper clipping”: Such tools can easily enhance the learning experience ☺*

*Many thanks to Daniel Mietchen, [Wikimedian in Residence on Open Science](#), for his interest in our wild flora project and desire to explore how we can collaborate in the fascinating world of open science: the links he provided were the inspiration for the last paragraph of “local content, global impact”.*



## Teachers, University Students and an Open Education Platform

Katerina Vigkou

*University students could produce OER under the umbrella of service-learning and an online platform could be created for students and teachers to help them prepare their lessons – OER.*

University students and school teachers could contribute a great deal to OE (Open Education). In this paper I discuss how we could motivate each one of them to produce OER (Open Education Resources). Moreover, a platform will be needed to help motivating the above volunteers, as well as to keep well-organized the information.

University students are an unexploited source of knowledge and they can contribute a great deal to Open Education. Study in Universities would be more interesting if you could apply the theories you are taught. Universities prepare future teachers, mainly theoretically. They do have practice as an obligatory course but what if students were able to put everything in practice producing MOOCs? They could do this for every theory they are taught. This could be a good opportunity for them to connect theory and practice and when every university includes such an innovation in their curricula we could create a huge source of MOOCs and/or other kind of OER. Service – learning offers the theoretical background to implement such a teaching strategy. Critical reflection as an integral part of service – learning would help students to master their knowledge as well as to produce the best possible resources. Service – learning by its definition offers double profit for both the student and the community, in our case the OE community. Lesson plans in the format of a MOOC and other OER would be created and stored in an OE platform, designed for this purpose.

University students have the will but they lack experience and the reverse happens for school teachers. The secret is to give each one a role that can play! School teachers instead of losing time preparing their own lesson plans for their classrooms they could use the ones that students have produced. Of course they could adjust them for their classrooms and this could be a great feedback for the student who produce it! Moreover, in the platform they will have the choice to prepare their own lesson – plans in a MOOC form. If school teachers prepare every afternoon next day’s lesson, why not produce it as a MOOC or prepare some OER for it? By using such a platform we could have again double profit. First of all, teachers would produce better quality lesson plans in less time and a database with OER would be created which would be enriched day by day!

One could enumerate many ideas to collect and produce OER, but a crucial point is how to make it sustainable. It all depends on the platform. The Open Education Platform should be intuitive. Teachers should not need to be educated to use it. The platform itself should lead you to learn how to use it. There is no need to develop a brand new method to motivate teachers to contribute in the platform. Video games and social networks have faithful and really motivated users. We could be taught something from these successful ICT accomplishments. The “lesson production” platform could be more than just a platform It could be a social network. A big community of teachers and students who prepare OER, exchange ideas, share their thoughts etc. Design elements and ideas that video games or

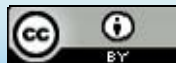
social networks apply could be used in order to motivate teachers and students become a part of the network.

Some examples to help you understand the platform better. According to the above idea users could enroll for free but they could have features to unlock and roles to be given in this platform - network. For example there might be a feature to use a recorded message in your MOOC, but this would be unlocked after the teacher uploads the 5<sup>th</sup> MOOC. In that way teachers and students would stay motivated but they would also have the chance to learn the platform step by step. The platform I am thinking of would enhance the interaction, not only between teachers but their students as well. Students should be able to rate and evaluate the lesson plans and this would make teachers even more motivated and make them want to contribute more!

Last but not least and because well begun is half done, we should start from asking organizations who already produce MOOCs and other OER. These organizations could help in two levels. Firstly, they could give valuable feedback about how the platform should be. Secondly, they should be the first to contribute with their MOOCs and their OER.

### **The vision and beyond**

This platform could become a place where teachers will work, university students will practice and school students all over the world will learn! The effort to collect OER has ended up creating a huge database of well – organised evaluated lesson plans.



## **Enabling the use of OER in schools in 2030**

Martin Wolpers, Maren Scheffel, Katja Niemann, Uwe Kirschenmann

*Enable teachers to simply create and use OERs in their respective educational scenarios.*

### **OERs today**

Open Educational Resources (OERs) have been available on the internet for quite a while. When referring to OERs, we understand the following specific concepts in close relation to how the OECD defines OERs (OECD, 2007): “Open” means that resources are findable and accessible via the web, but not necessarily for free. “Educational” refers to the context of use, that is, resources can be used for educational purposes. And “resources” refers to any kind of digital representation, may that be some sort of media (e.g. writing, images, simulations, or movies) or some sort of service (e.g. experiments, personal learning environments, distributed labs, etc.)

One of the most apparent, but not really addressed yet, problems with OERs is their support for reuse and repurposing. We carried out a number of European projects with school and university teachers to gain experience in their handling of OERs. The following projects were involved: The MACE project aimed to make architectural contents on the web available for educational contexts by establishing a portal with community functionality on the bases of a central metadata repository about architectural contents. The OpenScout project aimed to enable repurposing of educational resources in the domain of management education. It created a respective community portal. The NaturalEurope project aims to simplify the creation of learning paths through museums using digital representations of artefacts. The ROLE project supports the creation of personal learning environments (PLE) by enabling their educationally driven compilation. And finally and most recently the OpenDiscoverySpace project aims to make educational resources easily available to European school teachers.

One of the generalizable results from these projects is that most teachers prefer to use their own learning resources (Okada et al., 2012, Angehrn et al., 2012). Consequently, teachers are not really willing to just use OERs as they are provided. Instead, teachers pick those elements of OERs that they deem useful in their specific educational context. Even though this need has already been foreseen for a long time (Duval and Hodgins, 2003), it has not yet been adequately addressed. Too many problems remain unsolved today, among them questions regarding the rights of OERs, ways of finding suitable OERs, handling of quality of OERs and their metadata, funds to enable creation and provision, just to name a few.

### **The problem of legal obligations**

It is not clear how teachers can reuse elements of OERs, which legal obligations they have to fulfil, or which laws they have to follow today. Furthermore, teachers are not being educated in the use of OERs, including how to repurpose them, which legal aspects are to be dealt

with, and how to make OERs available. In addition, it is unclear who owns OERs when a teacher creates them.

### **The problem of finding suitable OERs**

Portals emerge that provide access to OERs. But help is needed to find the suitable or “right” OER that addresses the need of the teacher (Verbert et al., 2012b). Many OERs miss explanations on how to use them in which educational contexts. Only marginal support is given to help teachers find OERs that match their pedagogical requirements. For example, OERs lack some sort of usage history that might indicate how the OER has been or can be used. The usage history, e.g. in the form of best practice reports, would help teachers decide if an OER is worth the effort of repurposing or simply using it.

### **The problem of quality of OERs**

Furthermore, the quality of OERs covers a wide variety, though as of today, no accepted standards have been established to “measure” the quality of OERs or their metadata. The portals of today check the quality of the OERs according to their own ideas, thereby preventing the comparison of OERs provided by several portals. Instead, OERs are used as seen fit by the teachers with little guidance and support. The given support often consists of some user feedback on OERs. Still, while this “Amazon-style” recommendation support provides some hints on usefulness, it lacks the insight into how and in which context an OER has been used.

### **The problems of funding OERs**

Today, funds are made available to create OERs. But once the respective projects terminate, no further OERs are developed by the project consortia. There are some means identified on how funds for OERs are accessible (OECD 2007), but these suggestions have not been taken up. Rather, numerous schools and universities still see their educational resources as unique sales points and therefore are not willing to make them publicly available. They instead protect them where possible, e.g. through password-protected areas in their learning management systems.

### **OERs in 2030**

Indicators show that by 2030 the situation as described above will have changed significantly. Teachers will be able to simply reuse those parts of OERs that they need for their educational settings. Humans will be very tightly interconnected via services and channels on the internet and OERs will be enriched with metadata about the use and revision. This extended OER metadata description will provide the base for user-centric services around OERs that make use of OER common day practice. In addition, the change in understanding education in society is already visible today (education becomes more and more important, (EC 2010a, EC 2010b)) and will have taken place by integrating learning into daily work practice, both from a consuming and a producing/providing perspective. This will increase the need for OERs.

Furthermore, learning scenarios will have changed. For example, the role of the teacher will have changed towards a more mentor-like role. Classrooms are going to be established independent of location and possibly of time. Internet access will be available everywhere with enough bandwidth for high-quality video conferencing. The internet will give up net neutrality in favour of paid channels. Channels provide means of access for certain types of media and services, e.g. watching movies, listening to music, communicating, etc. as well as for learning activities. A learning channel will provide content and services for the domain of learning, suited to the single user’s needs.



In the above described environment, legal obligations regarding the consumption (learning), creation and maintenance of OERs will have been incorporated into the daily work life. For example, already today several large organisations (like Fraunhofer) promote the open access to academic publications. This can be seen as a first step towards incorporating the creation and maintenance of OERs (which academic papers are) into the workplace description. Consequently, funds are inherently made accessible for the creation and maintenance of OERs as well as for support infrastructures like providing servers, portals and their social web functionality, etc.

Finding suitable OERs will also be significantly simplified based on extensive metadata descriptions. The provided metadata about the OERs will incorporate comment and rating histories, usage, revision and repurposing histories (e.g. following an approach like CAM, Schmitz et al., 2011) and might even be accredited by some European agency (though standards would need to be developed for such purpose). A metadata scheme will emerge that is able to describe the respective information, most likely using micro-formats for specific fields. Instead of incorporating explicit educational information like a suitable age range, addressed students, etc., the schema will incorporate the context of use of the OER for each time that it is being used. OERs will then also be linked to competencies and user profiles which can be useful for the assessment of the achievements of students and teachers.

By relying on the context of use of OERs, profiling techniques like Learning Analytics and Educational Data Mining provide insights into advantages and shortcomings of OERs. Based on these and other technologies, new approaches to measure and evaluate the quality of OERs will be established. As the measurements will be community-driven, a much broader but also much more detailed spectrum of experiences in using OERs will emerge that help establish the context in which an OER is useful. Furthermore, OER recommender systems will also take the user's context into account when suggesting appropriate OERs. Tools will be available that support the simple repurposing of parts of OERs (e.g. Verbert et al., 2012a). Consequently, the metadata standard for OERs will draw on the findings of research on LinkedData for connecting OERs and on the findings of research on BigData for the provision of comprehensible analytics results of their usage.

## **Conclusion**

Given that the metadata schema for describing OERs as well as their storage, sharing, and maintenance will be done automatically (as much as possible), it will be much simpler for teachers to use OERs in future learning scenarios. Teachers can easily adapt OERs to their specific learning scenario, thereby creating new OERs and experiences that will then be shared as integral part of the OER. OERs will be independent of the specific learning scenarios, might that be mentor-oriented, based on peer-learning, or old-fashion classroom style.

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## Founding a New Alexandria

Paolo Zanieri and Patrizia Del Lungo

### *Open School Education 2030 – A new school between relationships and tools*

Thinking school anew means going back to the deepest and long lasting roots and, at the same time, exploiting the newest potentialities. In Alexandria in Egypt, a Library and a Museum were founded which were dedicated to research and study: the academics in all disciplines had the best library at their disposal and spaces where they could share their knowledge for the creation of a community of researchers. The school of the future should be founded on the same basis.

#### TOGETHER HERE NOW

Creating significant, interpersonal relationships among students and between students and teachers. In educational processes we cannot renounce a relational dimension based on real sharing and not only virtual communication. Team work is essential for facing complex problems, making use of different competences and the school should favor this method in order to avoid excessive competition or individual isolation. Our classrooms should help cooperation among different disciplines or, in the same subjects, among different teaching styles. The classrooms become group rooms where school community members focus their attention on certain questions or problems, they plan aims and tasks together, share or evaluate individual and group work. The advantages of a small space are exploited fully for about 50% of the whole time spent at school.

#### DIFFERENT BUT TOGETHER IN SPACE AND TIME

Interpersonal dimension expands towards a world level, so that the horizon is the largest possible as regards geography or history. Space and time must be the essential coordinates of the formative process. The “other” can be met connecting with people who live far away, welcoming people who come from far away, going to meet them, but also going back into the past: memory of the past is essential for the building of a mature democratic society.

Most of the school space is redefined as an open space, a cultural hub, where teachers and students make use of the available tools to create connections and research at various levels. A space that helps opening up to the world individually or in small/ large groups, that offers meeting or discussion points but also areas for individual work. A space where new technologies can put students and teachers in connection with distant realities but also local opportunities. 50 % of the school time should be spent here so that the advantages of an open but protected community can be fully exploited. Looking at others focused on their task enhances the feeling of belonging to an industrious large group and the willingness to be active in it. Carrying out individual, well defined tasks while necessarily respecting the efforts and the work of others, in a space that builds up occasions for cooperation and sharing, educates to values that are essential for future active citizenship.

## TO SEE WITH OUR AND WITH OTHERS' EYES

Large use of tools and devices can help to register evidences of present and past experiences. Use of paper and digital documents, texts and audio videos, old and new can help research and knowledge. Comparison of different methods, new or traditional, in order to achieve knowledge at a specific or multi subject level will give value and stimuli to one of the most important skills a student should develop at school: creativity.

Everybody agree that new technologies will play an essential role in the development of a new type of school. However, the respect for individual cognitive styles and the evidence of dramatic disparities in the access and skills to operate the constantly developing digital technologies suggests the necessity of a guided approach to them. The new school should offer structured spaces and meaningful opportunities for it.

In conclusion: many scholars have claimed that our way of thinking is rapidly changing with the use of technology, a net style process is replacing sequential processes. In the passage from oral communication to written communication memory lost its essential function but was substituted by new logic reasoning ability. The change which is now taking place should be valued and guided in order not to lose what we have received in terms of cultural heritage and scientific methodology from previous generations but, at the same time, exploiting the immense potentialities of technological innovations:

A NEW SCHOOL THAT DRIVES THE CHANGE

# Open Education 2030

## Contribution to the JRC-IPTS Call for Vision Papers

### Part II: School Education

Work in progress: 15 May 2013

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