|New Era in Education, The Journal of the World Education Fellowship|
|Volume 101, No. 1, 2021, pp. 28—37|
|ISSN 2054-3662|

THE WEF CENTINERY ANNIVERSARY CONFERENCE KEYNOTE

The School of the Future

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Introduction

We may be thinking with particular poignancy at the moment of the closing stages of the First World War, a little over a century ago. At that time, the soldiers who had spent so much time in the unhygienic and pestilent trenches returned home, taking with them the origins of the most terrible pandemic, "Spanish" influenza. As we face the only comparable pandemic in the last century, we may perhaps be forgiven a glance back at history before addressing the subject of this conference, The School of the Future, The Future of the School.

I now live in Pontypridd, in South Wales, and in Pontypridd there is a memorial stone dedicated to Wilfred Owen, an English poet who died one week before the end of hostilities in the First World War. As far as I can tell, Wilfred Owen had even less connection with Pontypridd than I do, but he was the author of a poem, Miners, written after a mining disaster, that draws a parallel between soldiers and miners, who run great risks to secure the comfort of future generations. (The poem is in the Appendix.) In that poem he shows his empathy for the men who made up mining communities.

However, I have been thinking about another poem of his which records the pointless slaughter of a generation of young men in the First World War. In the *Parable of the Old Man and the Young* he argues passionately that the young were sacrificed because the old preferred to see that than to sacrifice their pride. It gives us pause, it should give us pause, to think about the many more recent occasions, especially in war, when the idealistic young have been sacrificed in the pursuit of the projects of an older generation.

The Parable of the Old Man and the Young

So Abram rose, and clave the wood, and went,
And took the fire with him, and a knife.
And as they sojourned both of them together,
Isaac the first-born spake and said, My Father,
Behold the preparations, fire and iron,
But where the lamb for this burnt offering?
Then Abram bound the youth with belts and straps,
And builded parapets and trenches there,
And stretched forth the knife to slay his son.
When lo! an angel called him out of heaven,
Saying, Lay not thy hand upon the lad,
Neither do anything to him. Behold,
A ram, caught in the thicket by its horns;
Offer the Ram of Pride instead of him.
But the old man would not so, but slew his son,
And half the seed of Europe, one by one.

It was in the wake of that double tragedy, the War to end All Wars, and the influenza pandemic, that the commitment to reform the education of the young, the New Education, and the New Education Fellowship were forged. Indeed, wars and disasters have often prompted efforts to reform education. In 1944, towards the end of the Second World War, ministers of education from the Allied Powers convened and not only stimulated radical reforms of state education (the Butler reform in the UK, the Langevin / Wallon reform in France, and so on) but also laid the foundations for the creation of UNESCO. So we should not, perhaps, be surprised that now, as we emerge from yet another crisis, our thoughts should turn to the reform of education.

Lighting a Fire, not Filling a Bucket

A quotation widely attributed to W.B. Yeats states that, "Education is not the filling of a pail, but the lighting of a fire". (Strong, 2013) Whether Yeats actually said it or not, the statement captures a truth that we feel moved by. Education is something restless and active, not static and pre-defined. The boundaries of learning are constantly shifting, pushed by each passing breeze. Even as Owen retells a story that is millennia old, he recasts it to mean something new, and relevant to understanding the circumstances he found himself in in 1918. And we imbue the same story with new insights and fresh connotations when we read Owen's poem and make it our own.

These thoughts should help us to see the need for reform in education at all levels. Some time ago I was working on a project, funded by the European Union, to produce teaching materials for an undergraduate programme. Our colleagues from countries in central and eastern Europe envisaged the project as producing a CD, a single source, containing all of the material that a student would need to be studied in order to achieve the understanding necessary to pass the course. Our colleagues from western Europe, for the most part, envisaged the project as providing a central spine to the programme, pointing out to a multitude of different sources where the study could be pursued further. These two approaches embody very different approaches to the curriculum. In the former, the boundaries of study are well defined, and the "content" of education fills the space within: in the latter the heart of the issue is well defined, but where it leads to is not. The latter model involved a spine from which interest could be developed and spread out. The former involved a boundary or envelope that enclosed and constrained interest within fixed, or "appropriate" limits. This is not exactly the same as the difference between a pail and a fire, but the parallel is clear, between a fire that fans out form its point of origin, and a bucket that contains.

Of course, the circumstances of the educators from different countries were different, and are different. When educational materials and books are hard to come by, the bucket approach makes sense; a CD with all the material ensures at least a minimum access to teaching materials and support reading. When books and teaching materials are plentiful, and when the opposite danger of information overload is present, then preparation for firefighting makes more sense.

Different educational spaces are different in these respects. I have the good fortune to have lived most of my life within a few hours' travel of the third largest reference library in the world. But even then, in the schools where I have taught, teaching materials have not been so readily available. In the span of only a few brief decades, we have gone from a situation where (in schools) photocopying was tightly restricted because of the cost, to one where access to e-materials is practically universal. This complete change in the circumstances in which we conduct education should be matched by a parallel transformation in the pedagogy that is used, as the pedagogy that is needed differs.

That transformation has been given different names: outcomes based education, the flipped classroom, active learning, critical thinking, the project method, in short the New Education. Recognition of the drivers of change in education is not

new; everything that I have said is well known to the point of being cliché. Certainly, it forms the background principles of the New Education Fellowship. I should be ashamed to repeat such old prescriptions for the future of education, and, indeed, I would be, but for one fact: educational practice has not changed very much in the last century.

It is said that, if a visitor came to our modern society from 150 years ago, she would see the very great changes that have been brought about over that period. Telephones, radio, television, not to mention computers and digital audio systems, were all unknown at that time. Public transport was drawn by horses. Our factories are now often as clean and antiseptic as our hospital once were, which may say more about how bad our hospitals were at the end of the nineteenth century than about our factories today. But let that visitor go into a school, and she would immediately feel the place to be familiar. The blackboard may have been replaced by an interactive whiteboard, but not much else has changed. Or at least, so we might have said until a few months ago, when circumstances forced much education to go on line. I will come back to the implications of that most recent experience shortly, but for the moment I want to concentrate on what else has not changed.

And the most important thing that has not changed is the way that education is thought about, talked about, and planned. Despite the sterling work done by the advocates of the New Education between 150 years ago and now, it is still very common to hear government ministers responsible for education talking about "delivering the curriculum", as though it were a box of groceries. Many educational theorists talk about the importance of "time on task", as though learning was like working on the assembly line in a factory, and the more time you devoted to it, the more learning you did. We have even heard discussion of changing the school calendar, because children forget what they have learned over the year during the long summer holiday. (Now I am sure that I have forgotten many things that I was taught at school, but the idea that I would have forgotten something important just because I put it down for six weeks strikes me as unbelievable.) And when I talk to teachers about increasing the involvement of pupils and students in managing their own learning, the most commonly used concept appears to be "control"; the teacher needs to be in control of the classroom, of the flow of information, of the pupils' attention.

All of these examples indicate that we are still thinking about education as a bucket to be filled rather than a fire to be lit. From time to time I will engage with teachers about the importance of using formative assessment as well as summative assessment. It can be hard going to persuade them that such a change is necessary, be generally speaking most can understand a rationale for formative assessment. And the most common rationale for formative assessment is that it provides *the teacher* with information that can be used to improve *instruction*. I put "formative instruction" into Google, and my first hit was to the Glossary of Education Reform (2020), which has the following to say about formative assessment:

> Formative assessment refers to a wide variety of methods that teachers use to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or course. Formative assessments help teachers identify concepts that students are struggling to understand, skills they are having difficulty acquiring, or learning standards they have not yet achieved so that adjustments can be made to lessons, instructional techniques, and academic support.

The vast majority of the top ten hits were similar in tone, stating that formative assessment provided important information for the teacher. But why should this be the case, when the person who most needs to be informed about their progress is the student?

This is just another aspect of the emphasis on the teacher controlling the process of learning.

I learnt most of what I know about lighting fires from my brother, Richard. He loved fire, and would watch coals burning for hours, or sitting by the glowing embers of a camp fire, occasionally prodding or adjusting the supply of fuel to the flames. But most importantly, he could light a fire in almost any conditions. And this was a very important skill when we went camping, and many a meal was ruined and inedible because it was impossible to get a good fire gong because of the wind or rain. In those difficult conditions, Richard was never without a roaring fire.

For me, the turning point came when he explained that I needed a different way of thinking about fire: "Getting a fire to spread is easy. Societies spend huge amounts of money on fire brigades and fire alarms. Stopping a fire is what is difficult". All that is needed to be successful lighting a fire is to stop doing the things that will put it out.

A fire needs fuel and oxygen, and it needs to be at a high enough temperature so that when the fuel and oxygen come together they will burn. If you remove any of those three conditions, the fire is finished. And so, Richard would spend time lovingly blowing the centre of a young fire, giving it the oxygen he knew it needed, and would take care not to pile on fuel so quickly that it blocked the flow of oxygen. And before long, the fire would take care of itself and flourish.

The only people who talk about controlling a fire are those who want to put it out.

A World Out of Control

These last few months of pandemic have shown us the limit of human control in many ways and in many areas. But for us, the key area is the effect the pandemic has had on education. Rick Lavoie has pointed out, in a different context, how very strange the educational environment is (Lavoie, 2007). There are very few circumstances in which human beings regularly gather in such high density as can be found in a school classroom. And for that reason, schools have been forced to look at different ways of organising classes, especially using such on-line conferencing tools as Zoom.

This experience of using on-line teaching has produced several important lessons, some of which we may not have wanted to learn. The most important is that it is impossible simply to transfer what we had previously been doing to a digital platform like Zoom. And at least part of the reason for that is that a teacher cannot control a virtual classroom in the same way that he or she can control a physical classroom. That may have something to do with proximity, and the fact that, never being more than a few feet from any pupil makes it easier to dominate them. But it is also about all those little unspoken cues and non-verbal feedback that we receive without noticing from people with whom we share a space. Turn those of, and leave the teacher talking at a non-responsive computer screen, and something has certainly changed.

If one listens to a person who has never used Zoom (or similar platforms) before, what is most noticeable is that the average person can talk for perhaps two or three minutes before needing reassurance that his or her audience is listening and following the argument: "Can you hear me?" they will ask. Talking into complete emptiness is not natural, and is not easy. A consequence of this is that the staple of the transmission model of education, the didactic talk or lecture, is rendered uncomfortable for all involved. It may or may not previously have been uncomfortable for the learners, but now the teachers will also have to rethink the question of what education should involve.

The other control problem that arises in the case of group communication is that it is very difficult to manage or choreograph the passage of the conversation from one person to another. In everyday, face to face conversation, we look to cues that a

person wants to speak. In a formal sense, they might raise their hand, and this can be mimicked in Zoom. But at a more subtle level we watch for other parties to indicate that they have something to say; they move to the edge of their seat, they lean forward, they tense, or they open their mouths. With those subtle indications removed, group conversation can rapidly deteriorate into chaos, with people talking over each other, competing for attention, producing a Babel of noise. This is exacerbated by the technology, which has its own feedback loops and interferences, and attenuations of intelligibility when the limits of bandwidth are reached.

We should, perhaps, not be surprised by these changes that are brought about by the change in the medium used for education. Long ago, Marshall McLuhan (1964) told us, or warned us, that the medium is the message. However, in this case we should perhaps rejoice that the media forced upon us by a regime of social distancing pushes us in a direction that advocates of the New Education have been promoting for over a century.

If conventional didactic instruction is made impossible, or very difficult, we will need to consider other approaches, many of which will rely on placing more responsibility in the hands of the learner. Project work, setting tasks of individual study for later group discussion, leaving students and pupils to pursue their own interests drawing on available resources, and similar approaches to structured learning all become more attractive.

And it should perhaps be noted that this approach is not only indicated by a move toward remote teaching over the internet. It is made easier by the ready availability of excellent instructional material. In part the burgeoning of instructional material has been driven by the wish of large publishing houses to capture the education market. Integrated schemes are now available to support learning, with videos, apps, interactive activities and so on, all of which support the pupil to work on his or her own while not directly supervised by the teacher. Much of this activity has been criticised, and rightly, as being part of a move towards standardisation and mechanisation of processes of education.

But we should not overlook the fact that the spread of the internet, and the rise of open source material, has made a wealth of other material available that can be interwoven into lessons and projects. My personal favourite (perhaps because I have a background in science education) is the array of science and mathematics simulations provided by the University of Colorado (https://phet.colorado.edu/). But, depending on the age of the pupils, a wealth of other material is available from Ted Talks, YouTube, and similar sources. The teacher is not restricted to commercial schemes unless they wish to be, and commercial schemes can be enriched by the addition of other elements.

And at a moment when teachers will find it increasingly difficult to continue with “business as usual”, it will become increasingly important for teachers to enrich the resources available to their pupils, viewing the curriculum more as a spine from which different interests can branch out, rather than as an envelope that includes everything necessary.

At the end of last semester I was living in the house of my sister-in-law, while she tried to manage the operation of her private school during the lockdown that was the response to the pandemic. And I heard her, and her teachers, complain frequently that working on-line involved more work than being present in the classroom. This was not just a question of the additional accessibility to pupils and their parents, who could raise a question about the class at any time of day or night, although that was clearly a contributing factor.

Another contributing factor to the workload was the emotional energy that was absorbed, perhaps unexpectedly, by being called upon to do something that looks as though it should be familiar, namely teaching a class, when the circumstances have changed subtly, but beyond all recognition. At that time the BBC published an article

that looked at why virtual meetings, even meetings with friends, which one might think should be relaxing and socialising, seemed to be particularly draining (Jiang, 2020). The truth is that the extra feedback one gets when talking face to face helps to reduce stress levels. This is one case where less definitely is more.

And a final contributing factor may well be the frustration of teachers' expectations that they should be able to control the concentration of every pupil in front of them. It may never be possible, but it is easier to see the signs of a wandering concentration when a pupil is gazing out of the classroom window than when they are equally disconnected in a virtual meeting.

But not everything about virtual classrooms is negative. Take, for example, the use of mobile phones. I routinely teach in university classrooms that display a list of rules, which include the instruction that mobile phones are not to be used. Equally routinely, my students break that rule, and refer to their mobile phones in class. And on occasion, students will say, either during the class or at the end of the class, that while I was talking they had looked up information about one of the authors that I had mentioned, and had found additional interesting information. Of course I am not naive enough to believe that on every occasion when my students refer to their mobile phones they are simply adding footnotes to my lectures. But it happens often enough to indicate that the technology can break down the barrier of the classroom wall and allow interest to branch out from the core of what is being presented in the curriculum.

We are forced by present circumstances to rethink the idea that teachers can, or should, control everything in their classroom. The pupils and students *de facto* become more active in directing and managing their own learning. And this is a direction that advocates of the New Education have long embraced. We have an opportunity here to experiment with approaches that may serve us well in the future. We must make sure that we do not simply slip back into the old and comfortable ways of doing things next year.

The Challenge

Lately we have been forced to look at education in a different way, to embrace change, and to think of learning as something that follows its own path, like a bush fire. At times those changes have been difficult, but generally speaking they have had their positive side. Now, if we are to conserve the benefits that have accrued from this difficult year, we now need to address ourselves to re-thinking the role of teachers in the process of education.

At their best, teachers have always had multiple roles. They have provided inspiration, introduced novices to complicated ideas in an attractive way, given counselling on how to bring intellectual development and personal development together, guided the pupils'/students' interests into fruitful pathways, and, occasionally, when necessary, been an external source of discipline and control. Unfortunately, as the example of formative assessment above shows, in the past even the most liberal and progressive reforms have sometimes been swamped by the impulse to control. And control has served teachers rather better than it has their pupils.

Re-thinking what teaching involves will not necessarily involve a complete change. It will not involve teacher from stopping doing what they have always done. But it may involve a shift in the effort expended on each of those activities that we have become familiar with as part of "teaching". It will involve less emphasis on control; it will mean learning to step aside and let the fire of learning rage on in its own way, without trying to control it and risk putting it out. And of course, that will also mean being more responsive to the needs of pupils, not in the sense that we may previously have meant, of knowing what our pupils needs, but in the sense of listening to them and being ready to search for the material they ask for to satisfy their curiosity.

For it a good flow of oxygen is essential to the development of the fire, the free flow of curiosity is the basis for learning.

But I do not wish to minimise the changes that are needed, even if at one level they can be described as a slight shift of emphasis. At another level, they involve changing everything. Teachers often have the self-image of being omniscient. No rational person believes himself of herself really to be omniscient. But many teachers fear that if they admit to not knowing something, they somehow risk the respect of their pupils, and certainly put their control in jeopardy. The teacher cannot risk being seen as lacking in knowledge. This must change. And it will be a wonderful burden to shed. With so many independent sources of information, teachers will learn to be comfortable with saying, "I do not know the answer to that question, but we can search for the answer together". And in the process they will hopefully teach the skills that are relevant to the modern world, most importantly the critical skill of evaluating information that is all too readily available.

We face a crisis in education that is in many ways analogous to the crisis of childhood obesity. For most of the history of humankind, food has been in short supply. We have evolved to eat when food is available, and especially to consume foods that are high in energy. But today, most of us in the modern world live with abundance. Of course there are poor and hungry people in all societies, and I do not mean to belittle the problem of hunger in some parts of the world. But compared with people one thousand or ten thousand years ago, we are relatively well provided for. And our habits and our instincts, far from serving us well as they have in the past, lead to a different problem entirely, that we have not learned to deal with surfeits.

In much the same way, our education systems have been developed for times of information shortage, even starvation. In those circumstances, a teacher who was the fount of knowledge, who could supply diverse information to pupils who were crying out to satisfy their curiosity, was necessary for the functioning of the education system. Today, information famine has been replaced by information feast, and the problem is more to avoid indigestion than to compensate for a lack of information.

Today, everybody is familiar with some of the basic tools for finding information. Google is everywhere. But Google is only a couple of year older than this century. I remember very well the evening when I was at dinner with colleagues, and one of them told us about this new search tool he had found. But the last twenty two years has not seen any real shift in the way we think about mainstream education until now. And the problem that Google (and other on-line resources) create for the teacher is that he or she runs the risk of looking ridiculous if they claim to know something which a simple internet search shows to be wrong. Teachers need to learn how to live with abundant information, and, among other things, that means learning to understand their limitations.

If we are to preserve the best of what we have been forced to adopt in the last year, we need to change teachers' behaviour, to ensure they have new skills, and perhaps more importantly develop new attitudes to the process of education. And reflecting on that question put me in mind of the hierarchy of levels of change developed by Robert Dilts (2003) under the influence of Gregory Bateson. This hierarchy includes the levels, from the bottom upwards, of behaviour, capabilities, beliefs and identity.

Dilts argues that change at each level must involve change at the next level up the hierarchy. Thus if we wish teachers to change their behaviour, we must provide them with the opportunity to develop new skills and capabilities. But they will only develop new capabilities if they also change their beliefs so that they feel that those new capabilities are necessary and important. And a change of beliefs, if it is to be effective, cannot be superficial, but must be based in a change in the teacher's own identity; how they view their function and role.

A person will not readily engage with changing his or her behaviour if he or she is not fairly confident of success, which is to say if he or she does not have the

skills and capabilities to make success likely. But having a skill is not merely a question of being able to go through some kind of performance; a skilled practitioner must also have a sense of self-awareness, of critical reflection, which allows them to understand the level of their own skill. Developing a skill is not a random act of chance, or a response to external stimuli, like Skinner's pigeon learning to walk in a particular pattern. The skilled person must have attitudes and beliefs that involve evaluation and a commitment to self-improvement. But if such an approach to self-improvement is to be effective, the teacher must embrace the professional identity, that this skill and its monitoring are the kind of thing that teachers need to do.

This sense of what is appropriate to one's identity is crucial. I have already mentioned that in a negative sense it can shape a teacher's behaviour, as when a teacher believes that it is not appropriate that a teacher should be seen not to know the answer to a question. People can be very strongly attached to a professional identity, to the extent that it may damage their ability to operate, or even threaten their lives (Weick, 1999). I do not by any means with to underestimate what I am calling for when I suggest that a change is needed in teachers' professional identity. Indeed, the magnitude of the task may explain why so little has been achieved in the last hundred years.

I do not have either the time or the space to go into this now in more detail, but I leave you with the thought that, if we are to bring about long term and fundamental change in the school, to create a school that can face the future boldly, our efforts depend upon our ability to reconsider the role of the teacher, and the self-perception and identity that teachers have. There will be many aspects to this, but they must include a shift from seeing teaching as an act of control, to an act of inspiration. The teacher must be an arsonist and not a firefighter. Teaching must be lighting a fire, and not filling a bucket.

Concluding remark

I hope and trust that, if we can all engage in reconfiguring what it means to be a teacher, we will open up new possibilities for schools of the future that we can barely imagine today. And for that reason it would take a braver man than me to speculate in too much detail about the nature of the future school.

- *Professor Turner's keynote for the WEF Centenary Anniversary Conference (Virtually), Tokyo, Japan, on 13 September 2021.*

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Appendix

Miners (by Wilfred Owen)

There was a whispering in my hearth,
A sigh of the coal,
Grown wistful of a former earth
It might recall.

I listened for a tale of leaves
And smothered ferns,
Frond-forests, and the low sly lives
Before the fauns.

My fire might show steam-phantoms simmer
From Time's old cauldron,
Before the birds made nests in summer,
Or men had children.

But the coals were murmuring of their mine,
And moans down there
Of boys that slept wry sleep, and men
Writhing for air.

And I saw white bones in the cinder-shard,
Bones without number.
Many the muscled bodies charred,
And few remember.

I thought of all that worked dark pits
Of war, and died
Digging the rock where Death reputes
Peace lies indeed.

Comforted years will sit soft-chaired,
In rooms of amber;
The years will stretch their hands, well-cheered
By our life's ember;

The centuries will burn rich loads
With which we groaned,
Whose warmth shall lull their dreaming lids,
While songs are crooned;
But they will not dream of us poor lads,
Left in the ground

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