Educating for the Fourth Industrial Revolution

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Educational institutions must empower global citizens to address rapid global changes. Many predict that the Fourth Industrial Revolution, resulting from increased and ubiquitous automation and the development of AI, will eliminate many of the jobs currently available. Together with neurotechnological and genetic developments, these changes will create new opportunities as well as serious challenges that require a heightened commitment to placing humans at the center and empowerment as a goal[1]

Homo sum, humani nihil a me alienum puto. To be human is to live so that nothing human is foreign to us. Such was the aspiration expressed by Terence in his play *Heauton Timorumenos* several centuries ago. Such aspiration was also shared by Erasmus in the 16th century: "My own wish is to be a citizen of the world, to be a fellow citizen to all men — better still a pilgrim", and by the other humanists who saw in religious fanaticism and chauvinistic nationalism the root of much violence. Building on these cosmopolitan roots of humanism, the intellectual architects of the Enlightenment — John Locke, Adam Smith, Emmanuel

IMAGE: Shutterstock

Kant, and Jean-Jacques Rousseau — proposed a cosmopolitan project of societal improvement based on collaboration of ordinary people across all boundaries. It was in such a way that the three institutions created by the Enlightenment to advance such a project — democracy, public education, and the modern research university — all benefited from transnational collaborations and solidarity.

The public school was predicated in great part to promote a cosmopolitan vision, and Jan Comenius was the first to propose the idea of educating all. A few decades afterward, Erasmus made his intellectual contributions, largely to provide ordinary people the means to resolve their differences in peaceful ways and thus to avert conflict. Comenius should know about the bigoted roots of conflict as he had to leave his native Moravia as a result of pervasive religious intolerance at the time, prompting his neighbors to set his house on fire. On the long journey to escape religious intolerance, Comenius lost his wife and sons to poor health resulting from the dire conditions of his journey. He would end his life in Amsterdam, as a refugee, declining the offer to become president of Harvard University so he could write his thoughts of how education for all was the only avenue to peace.

To others who understood the possibilities that global citizenship offered us to advance humanity, the risks of bigotry and chauvinism were equally clear. In 1925, Teachers College Prof. Isaac Kandel gave a speech to the association of secondary school principals in which he made a vigorous case for global citizenship education in the US. Kandel argued that, unless schools in America prepared students for international understanding, the nation would become not a force for peace but a force for instability in the world.[2] Kandel gave his lecture a mere seven years after the end of World War I and fourteen years before the next major global conflict. Born in Romania and an immigrant to the US, he knew the pain and suffering caused by the violence of war and might have sensed, at the time he gave his speech, the fragility of peace, how conflict is never too far away, and how peace requires the cultivation of the dispositions to make peace possible.

The awareness of the devastation and suffering caused by World War II is reflected in the creation of the UN, the adoption of the Universal Declaration of Human Rights, and the inclusion of education as a human right in the declaration. Undergirding the declaration were the values of freedom, equality, and global solidarity. This was the cornerstone of much of the work of governments and of the global institutions created after World War II. But these values are increasingly challenged by populist and nationalist movements with strong xenophobic and intolerant undertones.

An emerging populist ideology challenges the cosmopolitan aspirations of public education, and of global citizenship education in particular. Populists challenge the very idea of universal human rights and the very notions of globalism, global solidarity, and collaboration. If nationalism is the new organizing force, the notion of in-group and out-group is defined by citizenship, not by membership in humanity, a challenge to the very idea of global citizenship.

If populists succeed in dismantling the global order built following World War II, this will reduce our ability to address global challenges. As populists renege on their commitment to collective action in addressing global challenges, this will create a social context in which teachers will find it increasingly difficult to teach about such global challenges.

Concomitant with the rise of nationalism and populism is a rise of hate groups and expressions of hatred in many parts around the world. In the US, there is a documented increase in intolerance expressed in and around schools

and universities in the form of more explicit expressions of anti-Semitism, white supremacy, Islamophobia, and hatred towards people of color and immigrants.[3] In this context, it is urgent that educators redouble their efforts to educate students for global citizenship. The inclusion of this as one of the targets in the UN's Sustainable Development Goals (SDGs) provides a helpful window of opportunity.

In an attempt to contribute to these efforts, I have recently published three curriculum resources that have been adopted by public and private schools in a number of countries around the world to support global citizenship education. The following five principles underpin these resources.

Start with the End in Mind When Designing Curriculum

A powerful approach to developing curriculum is to start with an ambitious end in mind — which is to educate global citizens. While most curriculum planning begins with direction in terms of the knowledge or competencies that it is aligned to, it seldom extends that end into a larger vision that informs the selection of such competencies. As a result, while there may well be an implicit long-term vision that provides direction to the competencies that guide the development of curriculum, such a vision is not public and therefore the central hypothesis that guides such curriculum ('if students gain these competencies they will be able to achieve the following') are not public knowledge, and therefore untestable. An alternative approach makes the two key hypotheses that undergird any curriculum public and therefore the subject of professional and public accountability. Those key hypotheses are: first, that if we engage students in particular learning experiences, they will gain certain capabilities; and, second, that if they gain such capabilities, they will be able to achieve particular long-term results, with consequences to them and to the communities of which they are members.These resources align curriculum with a public, ambitious, and non-partisan vision that has been endorsed by governments globally. This is as close as we can get to a public compact reflecting humanity's shared aspiration of 'the common good'. The SDGs offer an aspirational vision of a world that is inclusive, in peace, and sustainable. Each of the 17 goals included in the framework was adopted by more than 150 world leaders at the UN General Assembly in 2015, and the goals drive a series of specific targets, each spelt out in ways that are measurable, providing, in short, a compact for global citizenship.

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Leverage Improvement Networks to Design Curriculum

The second principle underlying the design of these resources is that the task of curriculum design, particularly when it involves domains that are novel or complex, is one that requires collaboration with colleagues. While we may cherish the ideal that each teacher should be able to develop their own curriculum, in practice the work of teaching is structured in such a way that it seriously limits how much time can be devoted to curriculum design.

Professional networks have a distinct advantage as a way to leverage collective intelligence. They can adapt dynamically to feedback resulting from rapid cycles of experimentation, and they can augment the learning resulting from similar cycles taking place concurrently in multiple settings. In this sense, professional networks have an inherent potential for learning and adaptation that eludes more conventional forms of producing curriculum and textbooks.

Learn by Doing

The third principle is that professionals must necessarily experiment as a way of creating new knowledge. An improvement network is simply a large laboratory that allows continuous experimentation in the search for solutions to complex challenges. The epistemology that undergirds this principle is that professional knowledge must draw on practice; it cannot be generated in the absence or be devoid thereof. Teaching is a profession not only in that those who practice it must master expert knowledge to guide their work but also in the sense that they must contribute to the development of such expert knowledge. For such practice-based knowledge to become professional

17 Goals to Transform Our World

Above: Illustrated above are the UN's 17 Sustainable Development Goals, of which goal four is quality education and seeks to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" by 2030

knowledge, that is, knowledge available to others in the profession, it must be public — not private — knowledge. A professional network is one way to make the knowledge that emerges from practice subject to the essential scrutiny for it to become publicly accepted. Furthermore, reliance on the principles of design-based thinking and of improvement networks provides a context for systematic experimentation and testing of those hypotheses that are implicit in any curriculum.

The Power of a Problem-based Education

A fourth principle is that some of the capacities necessary to thrive in the 21st century are best gained by engaging students with real problems and by inviting students to try out solutions to those problems. Increasing evidence suggests that problem-based education — that is, education that gives students opportunities to develop their agency and breadth of skills — is essential to preparing them for the demands of the Fourth Industrial Revolution.

The Power of Collaboration in Diverse Teams

Finally, preparing students to successfully seize the opportunities of the Fourth Industrial Revolution and achieve the SDGs will require unprecedented collaboration at all levels. If there is one skill all learners will need to develop, it is the skill to collaborate.

Global citizenship is essential for seizing the enormous possibilities and addressing the great challenges of our times. While cultivating it is the task of educators, the global community is equally responsible for supporting and encouraging, in a collaborative manner, the education of global citizens to whom nothing human is foreign. R

Endnotes

[1]Klaus Schwab, *The Fourth Industrial Revolution* (New York: Crown Business, 2017)

[2] Isaac Kandel "International Understanding and the Schools" (address delivered before the National Association of Secondary School Principals), in Isaac Kandel, *Essays in Comparative Education* (New York: Teachers College, 1930), 228–235

[3] Southern Poverty Law Center, "The Trump Effect: The Impact of the 2016 Presidential Election on Our Nation's Schools," 28 November 2016, *splcenter.org/20161128/trump-effect-impact-2016-presidential-election-our-nations-schools*. See also Southern Poverty Law Center, "Hate Map," accessed 5 May 2017, *splcenter.org/hate-mapPaper 2016/3*