財團法人黃昆輝教授教育基金會
2022教育政策國際研討會
特邀演講集

Professor Huang Kun-Huei Education Foundation
2022 International Conference on Educational Policy

Invited Speeches

Aya Yoshida
Waseda University, Japan

Kerry J. Kennedy
The Education University of Hong Kong, Hong Kong

Rupert Wegerif
University of Cambridge, UK

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University of California at Los Angeles, USA

Compiled by Professor Huang Kun-Huei Education Foundation
財團法人黃昆輝教授教育基金會　編印
2022年10月

財團法人黃昆輝教授教育基金會 2022教育政策國際研討會 新世代、新教育、社會變遷中的人才培育
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Education and AI in Japan: Solving Problems or Amplifying Problems?

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1. Informatization of Education and AI/DX: Introduction

The purpose of this paper is to explain when and how DX (Digital Transformation) through AI (Artificial Intelligence) in educational policies in Japan in recent years began to be promoted. I would like to give an overview of what kind of educational philosophies support these educational policies, and then examine whether there are any problems or pitfalls in these educational policies.

DX through AI has been promoted in all areas of Japanese society in recent years and is not limited to the area of education. In fact, it can be said that DX through AI in education has become a relatively new policy issue compared with other social areas. It is not easy for individual education institutions to freely start new things, because education is regulated by the government as "public" education. The business world, which bases its activities on economic rationality, pursues novelty with the aim of earning profits freely and flexibly. Compared to it, the movement in the field of education is sluggish and slow. And we could explain this feature of education that education is established through a teaching-learning process.

We have to take into account both the aspects of the education provided by teachers and the aspects of the learning outcomes of learners. There is a time lag between these two aspects and it is not one to one relationship.

Prior to DX through AI in education, there is a policy trend of "informatization of education" that has been promoted mainly in elementary and secondary education. It has started since early 1990s and the meaning and the content of "informatization" has changed in every 10 years (Fujikawa 2021). In the 1990s (Phase I), PC was introduced into schools. In addition to utilizing those devices, "information literacy" which means to select the "right" information from a variety of information was an issue of education. In the 2000s (Phase II), the development of a network environment in schools became an issue for the informatization of education with the spread of the Internet. A new subject called "Information" started to be taught. In the 2010s (Phase III), DX through AI has begun.

It was 2016 when DX through AI in education clearly became the policy issue in *The 5th Science and Technology Basic Plan*[1] *(The 5th Basic Plan*, The same applies hereafter.). And the importance of AI and DX in education was redefined in *The 6th Science, Technology and Innovation Basic Plan in 2021 (The 6th Basic Plan*, The same applies hereafter.). It is stated that DX through AI is essential to realize Society 5.0, which Japan should aim for in the near future[2]. Society 5.0 is regarded as a future ideal

[1] The Science and Technology Basic Plan is a science and technology policy formulated by the government every five years based on the Science and Technology Basic Law enacted in 2005. In recent years, there has been a demand not only for the promotion of science and technology, but also for the creation of innovation.

[2] Society 5.0 means a future society which will come after a hunting society (Society 1.0), an agricultural society (Society 2.0), an industrial society (Society 3.0), and an information society (Society 4.0).

society that " brings prosperity to people through initiatives that combine cyberspace and physical space (the real world) by maximizing the use of ICT" (Cabinet Office 2016, p. 11). In *The 6th Basic Plan*, it states that "Society 5.0 will have sustainability and resilience against the threats we currently face and the uncertainty of the future, and keep the safety and security of people. We can create our own wellbeing in that society" (Cabinet Office 2021, p. 12). What is essential for the realization of this Society 5.0? The promotion of DX through the effective use of AI can do it, according to *The 5th and the 6th Basic Plan*. For that purpose, it is necessary to change the way of education and human resource development. In response to this, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) establish new policies related to DX through AI. In this way, AI and DX appear in the world of education.

I will specifically discuss the following four things in this paper. The first is the individually optimized education in primary and secondary education, the second is the collecting and utilization of educational big data, and the third is AI human resource development policies in higher education. Lastly, I will consider whether we would bump into a problem or fall into a pitfall when we promote these policies.

2. Individually Optimized Learning by AI

In response to Society 5.0 advocated in *The 5th Basic Plan*, the MEXT released *Towards the full use of advanced technology to support learning in the new era - Shibayama Innovation Plan of Learning* in 2018 (MEXT 2018. Commonly known as the *Shibayama Plan*[3]. The same applies hereafter.). This was the first policy that triggered the full-scale use of AI and the

promotion of DX in Japanese school education[4]. In the Shibayama Plan, cutting-edge ICT technology is supposed to provide education for children in remote areas and children who have difficulty to commute to schools. ICT is regarded as a means of distance education in this plan.

However, half a year later, *Advanced Technology Utilization Promotion Policy to Support Learning in the New Era (The Final Summary)* was issued and it clearly states the promotion of DX through AI (MEXT 2019, hereinafter The Final Summary). We can find a big step forward from the Shibayama Plan because it specifies how to use it in detail. The new wave of policy has started that children themselves use AI to advance their own learning. It lists the use of digital textbooks and digital teaching materials, collaborative learning between children and teachers connected to terminals, AI drills, and classes using AR or VR. Teachers could check how students make a progress in their learning with AI drill homework before classroom teaching, and then they can think how to proceed with the classroom teaching based on students' progress. AI finds each individual student' s learning progress. Each student can solve the tasks recommended by AI and check the stumbling blocks discovered by AI. In this way, AI is described as a magic wand.

The Shibayama Plan envisions the use of this cutting-edge technology

[3] Shibayama in the Shibayama Plan comes from the family name Mr. Masahiko Shibayama, Minister of MEXT at the time.

[4] Although the Commission on Informatization of Education for the 2020s which established in 2016 started the policy discussion to introduce ICT into educational institutions, the main purpose of it was to improve the ICT environment. Educational use of AI was not yet discussed in the Commission.

for distance education. Advanced technology is still called ICT and premises its use in the conventional one-to-many education format. However, only half a year later, *in The Final Summary*, cutting-edge technology becomes AI, and AI is positioned that creates appropriate learning for each child. It is said that AI enables "learning to be fairly and individually optimized" and "learning to bring out the full potential of children without leaving anyone behind" (ibid., p. 3).

This argument on individually optimized learning of each child is taken over by the Central Council for Education in 2019, and the report *Aiming to build a 'Japanese-style school education in Reiwa*[5] *': Realization of Individualized and Optimized Learning and Collaborative Learning that Brings Out the Possibilities of All Children* was issued in 2021. In this report, it is stated that "Based on the conventional Japanese-style school education which could nurture the children's knowledge, moral, and physical health by teachers' guidance, education using ICT should be developed as a useful and effective tool as soon as possible" (Central Council for Education 2021, pp. 5-15). And "GIGA School Concept"[6] is the base of this report. By equipping each child with a tablet and developing a high-speed, high-capacity information network in schools, a fair and individually optimized

[5] Reiwa is the Japanese name of an era which has started since 2019.

[6] GIGA is abbreviation of 'Global and Innovation Gateway for All.' Its first idea has brought to the Minister''s Commission on Nurturing Human Resources for Society 5.0 and it was a policy promoted by the entire government. The Shibayama Plan in 2018 was positioned as an extension of it and was enacted in the 2019 supplementary budget. In addition, the GIGA school concept was pushed very rapidly due to the fact that schools were forced to temporarily close for a period of time by the spread of the Covid 19 from 2020. As a result almost all local governments have completed this policy by March 2021. This is a rare example of an implementation of educational policy ahead of schedule.

learning environment can be built without leaving anyone behind. There is a notion that the ability of each child can be enhanced more definitely by using a tablet.

I would like to add that "individually optimized learning" has two aspects in this report: 1. individualization of instruction by teachers and 2. individualization of learning by students. The former is expected to reduce the workload of teachers and the latter is expected to maximize students' learning outcomes.

This new concept has passed on to the Working Group on Education and Human Resource Development in the Council for Science, Technology and Innovation in the Cabinet Office. The Cabinet Office has played the role of formulating the Science, Technology and Innovation Basic Plan every five years, but it has not always focused on education and human resource development. But this time is different from the past. Various ministries and agencies other than MEXT support this Working Group because the promotion of DX through AI in education was an urgent issue for the whole government. This Working Group has launched since August 2021, and published *The Policy Package on Education and Human Resource Development toward Society 5.0* in June 2022 (Council for Science, Technology and Innovation 2022).

The main issue of *the Policy Package* is also individually optimized learning. The reason of the importance of it is explained as follows. The normal class size of Japanese schools is as much as 40 students. It is hard for teachers to handle these number of students who have different attributes at the same time. There are many types of students in a class such

as gifted children, children with developmental disorder, children whose mother tongue is not Japanese, children who can not attend schools and etc. All of them are treated as the same in current educational settings and diversification of children are ignored. Children who have different attributes can not develop their specific abilities in this educational environment. We need to change the current educational environment by using AI and enhance each student possibility as much as possible. We need to change group education system into personalized one and AI is the best tool to create and proceed this individual learning environment. This is the logic of the *Policy Package*.

This is an extremely novel notion in education. Japanese teachers have traditionally thought the effectiveness of group learning and they have treated 40 students equally in a class. This new perspective (individually optimized learning), however, admits the difference among students' attributes and the difference of students' learning outcomes.

3. Constructing Educational Big Data

In order to promote "individually optimized learning," both "individualization of teaching" of teachers and "individualization of learning" of students are essential. A huge amount of personal information about a huge number of individuals is needed to achieve the above. It is said that AI easily analyzes such data as soon as possible, draws out learning trends, and presents the most appropriate learning content and learning methods for each individual child. AI is supposed to analyze learning progress, learning preferences, and find the optimized learning method. They are the logic of effectively use of AI in education.

It was *the Shibayama Plan* in 2018 that educational big data became a political issue. However, in this stage, educational big data were regarded as a tool for teachers and teachers could give an appropriate guidance for each student using an analysis of educational big data by AI. However, in *the Final Summary* half a year later, educational big data were regarded as a tool for individualization of students' learning. They can proceed their learning by themselves following AI's recommendation and "individually optimized learning" is completed.

It is relatively easy and possible to construct educational big data theoretically and technically, but there are a number of technical and social issues regarding how to introduce it into schools. Therefore, in July 2020, the MEXT set up the Expert Panel on the Utilization of Educational Data, where panel members discuss how to utilize educational big data without social problems. Six months later, in March 2021, this Expert Panel issued *the Fixing Issues on the Utilization of Educational Data (Interim Summary)* (Expert Panel on the Utilization of Educational Data 2021. the Expert Panel, the same applies hereafter.).

It proposes that the usage and scope of educational big data should be determined as follows. Firstly, the users of educational big data are divided into two: the first one is for educational practitioners who handle atypical children, and the second one is for policy makers and academic researchers who use them for the future society's benefits. The first data users are teachers, learners, and parents, and they handle personally identifiable data. In this regard, it is said that "improving the environment for teachers to use those data at school is an urgent task. It is also important for individual

learners (or parents) to fully use these data. And these process benefits not only individuals (the primary users) but also society (the secondary users)" (ibid., p. 6). Regarding the secondary use, we will analyze holistic trends of data that do not identify individuals and use it as information for academic research and policy formulation.

Secondly, there are also two types of using data: 1. public education data and 2. personal data. Public education data refer to school education in general, while personal data refer to data that are chosen voluntarily by individuals. Why are the data voluntarily used by individuals? Because "by aggregating various personal data such as medical data, lifestyle data, etc., the value of these data will increase our quality of life and they will give individuals benefit for their lives" (ibid., p. 24). Individuals create their own lifelong learning records for their own benefit throughout their lives.

What kind of individualized personal data are collected for individually optimized learning? Firstly, the objective and numerical learning results such as test scores and learning process of digital drills will be recorded. Secondly it should be noted that subjective and qualitative data will also be collected. For example, it lists the health condition of each student that teachers check in the morning, the teachers' observations of each child's daily life, the records of children's visits to the infirmary at schools, and the evaluation of each child that the teacher fills out on the report card in every semester. Such a wide variety of data collection is planned.

By the way, it is said that the Japanese government has a high wall between ministries and agencies. In response to the criticism that DX does not progress beyond that wall, the Digital Agency has launched in September

2021. As a result, the issue of the use of educational big data has become a cross-ministerial discussion in the Digital Agency as a hub. The Ministry of Internal Affairs and Communications, the MEXT, and the Ministry of Economy, Trade and Industry have joined it. In January 2022, *The Roadmap for the Utilization of Educational Data* has been stipulated with a view to 2030. It is stated that "the mission of DX in education is to create a society where anyone can learn in their own way, anytime, anywhere, with anyone." It also stated that the "three axes" of data which are 1. Scope, 2. Quality, and 3. Combination should be set, and in order to realize these "the whole design (architecture (image)) for the distribution and accumulation of educational big data should be proposed" (Digital Agency 2022).

According to *the Roadmap*, these educational data can be used not only for elementary and secondary education, but also for early childhood education, higher education, and vocational training from the perspectives of lifelong learning. And then, it is also beneficial to private companies because they can provide better educational materials and services.

In this way the educational big data seem to be a magic wand, which support lifelong learning of individuals, reduce the burden on teachers, develop effective teaching methods, promote evidence-based policy making and etc. It is described that big data bring benefits across all dimensions and that our future is fantastic.

4. Nurturing Data Scientists

In order to promote DX through AI, we need enough data scientists. In response to Society 5.0, the MEXT established the Commission on

Strengthening Mathematics and Data Science Education in 2016. The Commission published *Measures to Strengthen Mathematics and Data Science Education at Universities* in the same year. In this report, it is stated that "although the ratio of companies that make decisions using data analytics is 61% on average in the world, that of Japan is as low as 40%" (The Commission on Strengthening Mathematics and Data Science Education, p. 1). The MEXT announced that we focused on developing "human resources who had skills of mathematical thinking and data analysis." Its purpose is to "strengthen and revitalize Japan's international competitiveness." Based on these clear goals, the following three specific measures were implemented: 1. Establishing the Research Center for Data Science Education (provisional name), 2. Creating standardized curricula and teaching materials, and 3. Developing industry-academia collaboration networks for practical education. And then some universities have been selected to establish industry-academia collaboration consortia and to expand these movements to the whole higher education institutions. They are Hokkaido University, University of Tokyo, Shiga University[7], Kyoto University, Osaka University, and Kyushu University.

In the policy of creating Society 5.0 and promoting AI which has been the full force of Japanese society, the MEXT has cut into the higher education field by strengthening data science education and nurturing data scientists. Since then, 11 core institutions and 18 special field institutions

[7] It is unusual that Shiga University which is a local university was selected because other selected institutions were big research universities which were Imperial Universities before World War II. The reason is that Shiga University has established the Faculty of Data Science in 2017 which was the first in Japan.

have been selected up to 2022, and the second phase of consortia have started. These consortia have included 140 member institutions. Several model curricula on mathematics, data science, and AI have been created and model textbooks and teaching materials have published.

Another policy stream regarding higher education is from the Cabinet Office which is in charge of the AI strategy for Japanese society as a whole. In 2019, the Council on the Promotion of Integrated Innovation Strategy in this office has issued *AI Strategy 2019: AI for All People, Industries, Regions, Government.* (the Council on the Promotion of Integrated Innovation Strategy 2019) At the first page of the report it is stated that "Laying the Foundation for the Future: Educational Reform and Restructuring the Research and Development System," and "One of the major impetuses for the digital transformation is AI. There is an increasing demand for human resources who can create new value by designing products and services suitable for a sustainable future society" (ibid. p. 8). Training and nurturing AI human resources is an urgent issue. In terms of higher education in particular, the goal is for all university and technical college students to "acquire beginning level skills of mathematics, data science and AI regardless of their majors" (ibid., p. 12). It is noteworthy that the government itself took a leadership and created a system for certifying excellent educational programs of universities and technical colleges.

Regarding the certification system, the Review Committee on Certification System of Mathematics, Data Science, and AI Education Program was established in 2019. "The Literacy Level" of certification has been created in 2020, and "The Basic Applied Level" of certification has

also been created in 2021 by the Review Committee. Based on this system, 78 education programs have been certified as "The Literacy Level" in 2021 (MEXT 2021) and 138 education programs in 2022. Regarding "The Basic Applied Level," 68 education programs have been certified in 2022. Data science education in universities and technical colleges will be popular and progress soon.

In *AI Strategy 2019*, the prospect of developing AI human resources at each educational level is calculated with a target of 2025. According to it, approximately 1 million graduates of elementary and secondary schools a year are supposed to acquire an intermediate rank of "The Literacy Level" of certification, and approximately 500,000 graduates of higher education institutions a year are supposed to accomplish "The Literacy Level". Approximately 250,000 people, including about half of university and technical college graduates and very few high school graduates, are supposed to complete "The Basic Applied Level" of certification. And then it is expected that 2,000 people will reach "The Expert Level" each year, and approximately 100 people will reach "Top Class Level" each year who are supposed to be graduate students and young researchers[8], even though these two levels of certification are not examined yet.

In primary and secondary education, AI is used to individually optimized education and learning, and to develop human resources who can create new value. In higher education, everyone acquires knowledge and

[8] The spread of the COVID-19 from 2020 has further accelerated DX through AI in educational policy. In 2020, the "Ministerial Conference on Digital Reform" has been established at the Prime Minister's Office. In the same year, the MEXT has established the " Headquarters of Digitalization Promotion" consisting of the Minister of MEXT as the head of the headquarters,

skills of data science. It is Japan's educational policy that is trying to catch up AI advanced countries.

5. A Sense of Crisis of the Government

Behind the policy of promoting DX through AI in education since the 2010s, there is a strong sense of crisis that Japanese society lags behind in DX through AI. The Ministry of Internal Affairs and Communications published a research report titled *Survey Research of the Impact of Evolution of ICT on Employment and Working Styles* in 2016,. This report is based on the results of a questionnaire survey on the attitudes of Japanese working adults toward AI compared with that of the U. S. working adults. We can find the three interesting research results and governments comments on them.

Firstly, 63.1% of Japanese working adults and 51.9% in the U. S. working adults answer that AI has not been introduced into their workplaces and there are no plans to introduce it in the future. There is a wide difference between the two countries. The next long question followed by it is that "when AI will be introduced into various workplaces in the future, it is predicted that changes occur in the content and scope of working styles and daily operations as well as the knowledge and skills required. What kind of preparations would you like to do?" Although 46.7% of the U.S. respondents

four Vice Ministers, and heads of various bureaus (MEXT 2020). As the purpose of the promotion of digitalization in education, it has been discussed as follows: the promotion of mathematics, data science, and AI education in the same way, the promotion of high-quality education through a hybrid of face-to-face and online, and the use of CBT in university entrance examination. Research and development in higher education is regarded as the main target to promote them.

answer that "they would like to acquire new AI knowledge and skills in order to continue the current jobs," only 28.0% of Japanese respondents choose the same one. On the other hand, 51.2% of Japanese respondents answer that "they do nothing in particular," while only 22.8% of those in the U. S. answer so. The government comments on these findings: "the sense of crisis about adapting AI and the motivation is weak among Japanese working adults. AI will definitely penetrate in society in the near future. We should fear that many Japanese will not be able to adapt this trend and will be left far behind the new society in the future" (ibid., p. 41).

Secondly, the question is "what kind of AI utilization skill would you like to acquire in the future and what would you like to let your children acquire it?." 38.5% of Japanese respondents answer that "they do not want to acquire any specific AI skill and they do not want to let their children acquire it," It is far beyond the response ratio of the U. S. (15.2%). The next question is that respondents choose AI skill which they want to acquire from the AI list. The biggest difference between the U.S. and Japan is "creativity and design ability to consider how AI should be used" (Japan: 24.0% < the U. S.: 41.5%). The government comment on it is that "Japan needs to promote DX through AI as soon as possible. And then Japan also needs to develop a strategy for Japanese working adults to increase their motivation to learn AI skill. Otherwise we can lose the AI competition in the world" (ibid., p. 47).

Thirdly, regarding the question which is "do you have any need for learning environment or support system to acquire AI skill in the following list?" The response ratio of the U.S. is higher than that of Japan overall. The government emphasizes the importance of education and the establishment

of public support system to increase AI skill of Japanese. It is stated that "there is a limit to support for self-development at companies for improving AI environment. The role of public education, specifically compulsory education is important to increase capabilities, attitudes and stances to AI and to remove the sense of rejection to AI" (ibid., p. 48),"

As a whole the fear and the sense of crisis runs through this report such as "the gap between Japan and the United States in the use of AI will expand due to a lack of sense of crisis and lack of motivation to use AI" (ibid., p. 47). The AI policy raises the issue of preventing Japan from becoming an AI underdeveloped country and then discusses the skills necessary for AI human resources and the ideal form of education for them.

In addition, the results of the OECD's PISA 2018 survey give a great shock to the government. This is because the use of ICT in children's education in Japan was almost the lowest among the participating countries. For example, 4.0% of children "use computers to do homework" "every day" or "almost every day," while 78.8% of children "never or hardly ever" do so. The average ratio of OECD countries is 22.4% as the former options ("every day" or "almost every day") and 22.1% as the latter option ("never or hardly ever"). This does not mean that Japanese children do not use ICT. However, 47.7 % of Japanese children "play single-player ICT games" "every day" or "almost every day" and it is the highest ratio among participate countries, while 26.6% of children "never or hardly ever." The OECD average of this question is 26.7% for the former options ("every day" or "almost every day") and 32.5% for the latter options ("never or hardly ever") (National Institute for Educational Policy Research 2019). It is clear that while ICT use outside

school is high, ICT use in school is extremely low among Japanese children. That's why the drive to use AI in education become a strong policy issue in order to break away from Japan's position as an AI latecomer.

6. Policy Pitfalls

"Individually optimized learning", "constructing big data", and "nurturing data scientists": these series of educational policies are being accelerated. There is no objection toward them. We can easily understand that all of them are urgent tasks. However, we carefully reconsider these policies whether they bring benefit only and there is any pitfall in policies.

6-1. Individually Optimized Learning

First of all, there is a question about the possibility of "individualization of instruction" and "individualization of learning" in "individually optimized learning." As for "individualized teaching, " a main purpose is to remove teachers' workload. It is said that AI could find each student's learning difficulties in subjects and provide effective guidance to teachers how to teach. However, would it be possible to provide daily life guidance as a whole other than subject matter? There is no right answer to this issue. How can current AI technology handle these matters?

"Single purpose of artificial intelligence" that deals with a specific task, such as machine translation and chess software, can produce results that exceed those of humans. However, "artificial general intelligence (AGI)", which deals with various tasks in parallel and provides solutions in the same way as humans, has not yet appeared. Nobody knows whether it will appear in the future. In addition, the past data is important for finding solutions

of current problems for both humans and AI. However, AI gives solutions based on only statistical probabilities of past data (Nishigaki 2016). It is impossible for current AI to judge answer to human issues comprehensively.

"Individualization of learning" is the biggest feature of AI-based education. It is surely difficult to provide individualized instruction in a current 40 students in one class. One tablet for each student is supposed to be an effective tool to solve this problem. I, however, wonder if all children have motivation to learn independently. There exists a correlation between children's learning motivation and learning performance. Therefore individualized learning will lead to expand the gap among children's learning performance because all students do not necessarily have the same level of learning motivation. I also have a question that children tend to be passive learning style because AI always presents appropriate learning content and methods. How do children make self-reliant efforts of their learning?

6-2. Big Data Domination

The sales point of educational big data is that it becomes a good tool not only for school education but also for lifelong learning. It, however, could be a tool that controls an individual's life. I would like to point out three main issues in this regard.

Firstly, it is not clear that who watches over and manages the whole structure of the data. In the *Interim Summary* of the Expert Panel in 2021, it is not stated who is in charge of managing the data, and in *the Roadmap for the Utilization of Educational Data*, it is explained that the government does not centrally manage the data and the data will be managed in a distributed

manner. Who will take responsibility and how to solve a problem if any problem arises? In particular, the data for primary use of what the Expert Panel refers to are personally identifiable data. Its management requires caution in terms of security and privacy, but these points remain ambiguous (Information Law Research Institute, 2022).

Secondly, we can not compare some data because metrics are not consistent For example, teachers' observations of children's health conditions and daily lives are subjective and they are different among teachers and between schools[9]. These observer bias easily enter the data.

Thirdly, individuals are selected by the personally identifiable data. For example, some negative information in the past puts a stigma on an individual and leads to downgrade current or future evaluation of the individual (Saito 2016, Stephan Jones 2021). Furthermore, a certain trend that can be discovered from large amounts of anonymized data can be used to predict the future of an individual. For example, if there is an overall trend that children with low academic performance in the past are less likely to enter branded universities, it might be applied to a specific individual, and he/she might be stopped to choose his/her career by his/her own wish because of a low possibility derived from the big data. Children's growth is often unpredictable, and AI can predict the future based on only what happened in the past.

[9] When this Expert Panel was established, a committee in the Science Council of Japan discussed the use of educational data. *The Proposals on the utilization of learning data based on the educational digitalization: - Towards Evidence-Based Education* was issued in September 2020 (Science Council of Japan, 2020). Although we can find some concerns about how to collect and utilize personal information in the proposal, the tone is weak and is not in detail.

7. What Japan should do: Discussion

The introduction of AI in education is regarded as an undisputed imperative in recent policies in Japan. The reason is 1. that it is seen as a tool to solve existing educational challenges and 2. a sense of crisis that Japan will lose the competition in the world. It seems to be too optimistic trust to AI. AI, however, is not so omnipotent. It is often pointed out in the U.S that AI presents discriminatory analysis because the data set collected by AI is biased (Yokoyama 2021). If there is a bias in the input data, the output is also biased and AI does not tell us the bias in the output. We have to consider the current limits of what AI can do and then it is necessary to consider what humans should judge. Instead of catching up with AI advanced countries, we should recall the famous adage "Prevention is Better than Cure" only because Japan lags behind other countries.

References

Cabinet Office (2016) *Science and Technology Basic Plan* https://www8.cao.go.jp/cstp/kihonkeikaku/5honbun.pdf (Retrieved August 31, 2022)

Cabinet Office (2021) *Science, Technology and Innovation Basic Plan* https://www8.cao.go.jp/cstp/kihonkeikaku/6honbun.pdf (Retrieved August 31, 2022)

Central Council for Education (2021) *Aiming to build a 'Japanese-style school education in Reiwa': Realization of Individualized and Optimized*

Learning and Collaborative Learning that Brings Out the Possibilities of All Children, https: //www.mext.go.jp/content/20210126-mxt_syoto02-000012321_2-4.pdf (Retrieved August 31, 2022)

Commission on Strengthening Mathematics and Data Science Education (2016) *Measures to Strengthen Mathematics and Data Science Education at Universities*, https://www.mext.go.jp/b_menu/shingi/chousa/koutou/080/gaiyou/__icsFiles/afieldfile/2016/12/21 /1380788_01.pdf (Retrieved August 31, 2022)

Council for Science, Technology and Innovation, Cabinet Office (2022) *Policy Package on Education and Human Resource Development for the Realization of Society 5.0*, https://www8.cao.go.jp/cstp/tyousakai/kyouikujinzai/saishu_print.pdf (Retrieved August 31, 2022)

Digital Agency/Ministry of Internal Affairs and Communications/MEXT/ Ministry of Economy, Trade and Industry (2022) *The Roadmap for the Utilization of Educational Data*, https://www.digital.go.jp/assets/contents/node/information/field_ref_resources/0305c503-27f0-4b2c-b477-156c83fdc852/20220107_news_education_01.pdf (Retrieved August 31, 2022)

Expert Panel on the Utilization of Educational Data (2021) *Fixing Issues on the Utilization of Educational Data (Interim Summary),* https://www.mext.go.jp/content/20210331-mxt_syoto01-000013887_1.pdf (Retrieved August 31, 2022)

Fujikawa, Hiroyuki (2021) "Research Trends and Prospects for ICT Education," *Studies in Education*, Department of Educational Sciences, Graduate School of Education and Human Development, Nagoya

University, No. 64, pp. 15-30.

Council on the Promotion of Integrated Innovation Strategy (2019) *AI Strategy 2019: AI for All People, Industries, Regions and Governments,* https://www8.cao.go.jp/cstp/ai/aistratagy2019.pdf (Retrieved August 31, 2022)

Japan Institute of law and Information Systems (May 15, 2022) "Thinking about Japan's Education Log: Privacy Freak Cafe #16 (Part 1)," https://cafe.jilis.org/2022/05/15/347/ (Retrieved August 31, 2022)

MEXT (2018) *Toward the Full Use of Advanced Technology to Support Learning in the New Era: Shibayama Learning Innovation Plan,* https://www.kantei.go.jp/jp/singi/keizaisaisei/miraitoshikaigi/ dai22/ siryou3.pdf (Retrieved August 31, 2022)

MEXT (2019) *Measures to Promote the Use of Advanced Technology to Support Learning in the New Era*, https://www.mext.go.jp/component/a_menu/other/detail/__icsFiles/afieldfile/2019/06/24/1418387_02 .pdf (Retrieved August 31, 2022)

MEXT (2020) *Digitization Promotion Plan of the Ministry of Education, Culture, Sports, Science and Technology,* https://www.mext.go.jp/content/20201223-mxt_kanseisk01-000010143_2.pdf (Retrieved August 31, 2022)

MEXT (2021) *Overview of Certification System of Mathematics, Data Science, AI Education Program (Literacy Level)*, https://www.mext.go.jp/content/20210315-mxt_senmon01-000012801_1.pdf (June 5, 2019)

Ministry of Internal Affairs and Communications (2016a) *White Paper on*

Information and Communications, pp. 232-241, https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/h28/pdf/n4200000.pdf (Retrieved August 31, 2022)

Ministry of Internal Affairs and Communications (2016b) *Survey Research of the Impact of Evolution of ICT on Employment and Working Styles*, https://www.soumu.go.jp/johotsusintokei/linkdata/h28_03_houkoku.pdf (Retrieved August 31, 2022)

Miwa, Yokoyama (2021) "What We can Learn from the United States about AI and Race/Gender Issues, "*Journal of Industry-University Collaboration*, Japan Science and Technology Agency, December 2021, https://www.jst.go.jp/tt/journal/journal_contents/2021/12/ 2112-02_article.html (Retrieved August 31, 2022)

National Institute for Educational Policy Research (2019) *OECD Survey on Student Learning Achievement (PISA2018): 2018 Survey Supplementary Materials* https://www.nier.go.jp/kokusai/p i sa/pdf /2018/06_supple.pdf (Retrieved August 31, 2022)

Nishigaki, Toru (2016) *Big Data and Artificial Intelligence: Identifying Possibilities and Traps*, Chuko Shinsho

Science Council of Japan (2020) *Proposals on Utilization of Learning Data Based on the Digitalization of Education: Towards Evidence-Based Education,* https://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-24-t299-1.pdf (Retrieved August 31, 2022)

Stephan, Jones (2021) "27 Million People will be unable to Find Jobs due to AI Tools: The Automatic Resume Screening System will Turn the Doors Away," *BUSINESS INSIDER* https://www.businessinsider.jp/

post-241970 (Retrieved August 31, 2022)

Takechi, Kiyoshi (2019) "Laborers at the Mercy of Selecting by Artificial Intelligence: What should the Law Do?" *Fudai Keizai Ronshu*, University of Toyama, Vol.65 No.2, pp. 91-110, https://://core.ac.uk/download/pdf/275767046.pdf (Retrieved August 31, 2022)

Yamada, Hiroyuki (2018) "Internet Society and Education: The Myth and Reality of Changing Education," *Frontier of Educational Sociology 2: Changing Society and the Future of Education*, Iwanami Shoten, pp. 249-267.

Zhang, Jian (2019) "Ethical Issues Concerning Educational AI: Focusing on 'Educational Judgment'," *Annual Report of The Research Institute for Science and Technology, Tokyo Denki University*, No. 17, pp. 31-36. https://core.ac.uk /download/pdf/327150449.pdf (Retrieved August 31, 2022)

1-1
日本的教育與人工智慧：解決問題還是擴大問題？

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壹、前言：教育資訊化與人工智慧 / 數位轉型

本文的目的，在於闡述日本近年的教育政策係從何時，以及如何開始推動人工智慧（Artificial Intelligence, AI），以促進數位轉型（Digital Trransformation, DX）。全文將先概述這些政策的教育哲學背景，然後檢視這些政策是否存有任何問題或隱患。

近年來，運用人工智慧促進數位轉型（DX through AI, 譯者按：此一英文原文較中譯文簡潔，因在全文多次出現，故下文不再譯為中文，而直接呈現原文），在整個日本社會裡頭，所在多有，並不只以教育領域為限。事實上，跟其他社會領域相比起來，教育方面之 DX through AI，反而是個相對較新的政策議題。此乃因為教育具有政府規範之「公共性」，所以個別「公共」教育機構想要自由開展新局，並不容易。企業界則不然，他們的活動是以經濟理性為基礎，為了達成營利目標，可以靈活自由地追求創新。相較之下，教育領域的運作便顯得遲鈍而緩慢。關於這項特性，我們或可從教育運作最根本的「教學歷程」（Teaching-Learning Process）來予理解。就教學歷程來看，在教師提供教育

服務之後，到學生展現學習成果之前，其實存有一段時間差，兩者之間既非立竿見影，亦非簡單的一對一關係。

日本教育領域在推動 DX through AI 之前，有項始於 1990 年代初期，主要在中小學階段實施的長期政策，名為「教育資訊化」（Informatization of Education）。隨著時代變遷，這項政策對於「資訊化」的意義及內容，大約每 10 年都會有所調整（Fujikawa, 2021）。1990 年代為第一階段，彼時個人電腦（PC）導入學校，除了使用這些設備，教育的課題還包括：可從多樣資訊當中，培養選取「正確」資訊的「資訊素養」（Information Literacy）。2000 年代為第二階段，由於「互聯網」日益普及，教育資訊化的課題在於發展學校的網路環境，並將「資訊」設為一門新的教學科目。2010 年代為第三階段，開始推動 DX through AI。

DX through AI 之所以成為教育領域的政策議題，蓋與 2016 年發布之「第五期科技基本計畫[1]」（The 5th Science and Technology Basic Plan, 下文簡稱「第五期基本計畫」）有關。至 2021 年，「第六期科技與創新基本計畫」（The 6th Science, Technology and Innovation Basic Plan, 下文簡稱「第六期基本計畫」）重新界定了 AI 及 DX 在教育方面的重要性。該計畫指出，DX through AI 攸關日本能否在近期達成「社會 5.0」的目標[2]。「社

[1] 「科技基本計畫」是政府依據 2005 年頒布之《科技基本法》（the Science and Technology Basic Law），每五年修訂一次的科技政策。近年來，在科技的提升之外，更出現對於創新的需求。

[2] 「社會 5.0」指的是一個接續狩獵社會（社會 1.0）、農業社會（社會 2.0）、工業社會（社會 3.0）和資訊社會（社會 4.0）之後發展的未來社會。

會 5.0」指的是個未來的理想社會，「藉由資訊暨通訊科技（ICT）的最佳化運用，整合虛擬空間與實體世界，開創新猷，造福人群」（Cabinet Office, 2016, p. 11）。「第六期基本計畫」表示，「社會 5.0 在面對我們眼前的威脅和不確定的未來時，具有可持續發展的韌性，以維護人民安全。處在這樣的社會裡，我們能夠創造屬於自己的幸福」（Cabinet Office, 2021, p. 12）。那麼，實現社會 5.0 的根基何在？「第五及第六期基本計畫」認為，有效使用 AI 以促進 DX，便是解方。準此，教育及人力資源開發的方式，勢須有所變革。於是，日本文部科學省（Ministry of Education, Culture, Sports, Science and Technology, MEXT）乃據以制訂有關 DX through AI 的新政策，以資回應。就這樣，AI 及 DX 遂在教育界浮上檯面。

以下的討論，分為四個部分。首先是中小學教育階段的「個別優化教育」（Individually Optimized Education），其次是「教育大數據」（Educational Big Data）的蒐集及使用，第三是高等教育之 AI 人力資源開發政策，最後則是推動這類政策，有無衍生任何問題或隱患。

貳、AI 與個別優化學習（Individually Optimized Learning）

為回應「第五期基本計畫」之「社會 5.0」倡議，日本文部科學省 2018 年發布「全面運用先進科技支援新時代的學習：柴

山創新學習計畫」（MEXT, 2018. 俗稱「柴山計畫[3]」，下同），這是日本學校教育第一個全面使用 AI 促進 DX 的政策[4]。在柴山計畫裡，將資訊暨通訊科技（ICT）視為遠距教育工具，認為尖端 ICT 可為偏遠地區及通學困難兒童，提供教育服務。

然而，半年後，「支援新時代學習的先進科技運用促進政策（期末總結報告）」公布施行，明確規範了 DX through AI 的推展（MEXT, 2019. 下文簡稱「期末總結報告」）。較諸柴山計畫，這波新的政策，向前跨出很大一步，因為方法內容更為具體詳盡，可讓兒童自行運用 AI 來改進自己的學習。該政策介紹了數位教科書及數位教材的使用、師生透過終端機連結進行協作學習、AI 演練、以及運用擴增實境或虛擬實境（AR or VR）的課堂等。教師在上課前，可藉 AI 演練之家庭作業，檢查學生學習進度，然後參酌學生進度，實施課堂教學。AI 能夠掌握每個孩子的學習進度，並且每個孩子也能處理 AI 建議的功課，自行查核 AI 為自己找到的學習困難點。如此一來，AI 就像是一只神奇的魔杖。

「柴山計畫」認為，尖端科技可用於遠距教育，但只是將這些稱為 ICT 的先進科技，一仍舊貫地置入傳統一對多的教育模式。然而，僅僅半年時光，《期末總結報告》問世後，所謂的尖

[3] 「柴山計畫之柴山二字，來自時任文部科學大臣柴山昌彥先生（Mr. Masahiko Shibayama）之姓氏。

[4] 雖然 2016 年成立之「2020 年代教育資訊化委員會」（The Commission on Informatization of Education for the 2020s），曾展開有關資訊暨通訊科技（ICT）引進教育機構的政策討論，但其主要目的在於改善學校裡的 ICT 環境，並未針對 AI 之教育使用做過討論。

端科技變成 AI，相信 AI 可為每個孩子帶來適性的學習。該總結報告指出，AI 可促成「公平的個別優化學習」，「充分實現兒童潛能，不落下任何孩子」（MEXT, 2019, p.3）。

2019 年，日本中央教育理事會（Central Council for Education）採納每位孩子都應享有「個別優化學習」的論點，並於 2021 年發表《建立令和年代[5]日式學校教育：落實個別優化學習及協作學習以開發全體兒童潛能報告書》。該報告書指出，「傳統的日式學校教育，經由教師指導，兒童可以鍛鍊知識、道德和身體健康；在此基礎上，融入 ICT 的教育，應盡速完備其功用及效能，以提供助力」（Central Council for Education, 2021, pp. 5-15）。該報告書的論點，係以「GIGA 學校概念[6]」為基礎，認為給每個孩子配備一具平板電腦，並在學校建置高速度、高容量的資訊網路，便可建置一個公平的「個別優化學習」環境，帶好每個孩子。也就是說，每位兒童的能力，可藉平板的使用，獲得一定程度的強化。

此處想補充說明的是，報告書所稱之「個別優化學習」，包括兩個方面：一是教師實施「個別化的教」（Individualization of

[5]「令和（Reiwa）是當今日本天皇德仁的年號，也是日本現行的紀年稱號，自西元 2019 年 5 月 1 日零時正式啟用。推算下來，今（2022）年是令和 4 年。

[6] GIGA 是 Global and Innovation Gateway for All 的縮寫，意指「全民全球創新閘道」。其最初構想，曾提報文部科學大臣主持之「社會 5.0 人力資源培育委員會」（Commission on Nurturing Human Resources for Society 5.0）討論，並成為政府政策。2018 年之柴山計畫，即為其延伸計畫，業於 2019 年追加預算時立案執行。2020 年以來，由於 Covid 19 新冠疫情氾濫，學校被迫不定期暫時關閉，「GIGA 學校概念」遂得以迅速推行，2021 年三月，幾乎所有地方政府都已落實這項政策。對於教育政策之執行來說，這是相當罕見提前完成的例子。

Instruction），另一是學生進行「個別化的學」（Individualization of Learning），寄望前者能夠減輕教師工作負擔，後者可以增加學生學習成果。

這項新概念，已交請日本內閣府「科技與創新理事會」（The Council for Science, Technology and Innovation）之「教育與人力資源開發工作小組」（The Working Group on Education and Human Resource Development）憑辦。內閣府職司「科技與創新基本計畫」每五年一次的修訂工作，可是過去並未太過關注教育與人力資源開發業務。不過，現在狀況已有轉變。除了文部科學省之外，不少省、廳部門（Ministries and Agencies）也都支援上述「工作小組」業務，因為教育領域 DX through AI 工作的推動，已是整個政府的當務之急。該工作小組 2021 年八月成立，並於 2022 年六月發布《社會 5.0 教育與人力資源開發政策總覽》（Council for Science, Technology and Innovation, 2022）。

《政策總覽》的主要課題，亦與「個別優化學習」有關，理由如下：日本學校的班級規模，每班平均約 40 人，教師很難同時處理那麼多特質互異的學生。通常一個班上，會有許多不同類型的學生，譬如資優兒童、發展失調兒童、母語不是日語的兒童、無法到校上課的兒童等等。可是當前的教育設計，卻是一視同仁對待他們，忽略了兒童彼此間的多樣性，使得不同特質的兒童，無法在這樣的教育環境適性發展。我們必須借助 AI 之力，改變現狀，盡力加強每位學生發展的可能性。我們須將現行之團體教育模式，轉變為個人化的教育系統，而 AI 就是開創並推展這種

個別學習環境的最佳利器。《政策總覽》的理念邏輯，便在於此。

這是一種極為新穎的教育觀念。日本的教師，傳統上，滿腦子想的都是團體學習的效能，而將全班 40 位學生當成一個模子處理。「個別優化學習」這種新觀點，卻認為學生的個人特質及學習成果，都是有差異的。

參、建構教育大數據

教師以「個別化的方式教」和學生以「個別化的方式學」，是「個別優化學習」的基本要素。要做到這樣的教與學，需有無數個體提供大量之個人資訊。而 AI 可以輕而易舉地分析這些數據，從中紬繹學習趨勢，給每位小朋友送上最適當的學習內容及方法。換言之，AI 可以分析學習進度及學習喜好，從而找到最佳的學習方法，此即教育領域有效使用 AI 之道。

2018 年之柴山計畫，促使「教育大數據」成為一項政治議題。彼時，係將教育大數據視為教師的工具，教師可藉 AI 所分析的教育大數據結果，提供個別學生適當的指導。然而，半年後的「期末總結報告」，卻將教育大數據視為學生個別化學習的工具。學生可根據 AI 的建議展開自己的學習，達成「個別優化學習」。

建構教育大數據，在理論上及技術上，相對容易也相對可行，但如何將之導入學校，卻有不少技術及社會爭議。為此，文部科學省 2020 年七月設置了「教育數據使用專家小組」（The Expert Panel on the Utilization of Educational Data），請小組成員討論如

何使用教育大數據，而不造成社會問題。六個月後，在 2021 年三月，此一「專家小組」發表成果《教育數據使用的定位問題（期中總結報告）》（Expert Panel on the Utilization of Educational Data, 2021）。

這項成果報告，對於教育大數據的使用和範圍，有所界定。首先，教育大數據的使用者，可分兩類：一類是以非典型兒童（Atypical Children）為準的教育實務使用者，另一類是以未來社會公益為準的政策制訂及學術研究者。第一類的數據使用者，包括教師、學生及家長，使用的是可辨識私人身分特徵的數據。在這方面，該報告提到，「改善教師在校使用這些數據的環境，至關緊要，且個別學生（或家長）能夠充分使用這些數據，也同樣重要。這樣的數據使用過程，不僅對個人（主要用戶）有利，社會（次要用戶）也同蒙其利」（Expert Panel on the Utilization of Educational Data, 2021, p.6）。至於第二類的數據使用者，係就不揭露私人身分特徵的數據，分析其所呈現的整體趨勢，並將此資訊用於學術研究及政策制訂。

其次，教育大數據的使用，也可分為兩類：一類是公共教育數據，另一類是私人數據。公共教育數據指的是一般的學校教育資訊，私人數據則是個人自主選擇的資訊。為何個人會自發性地選用某些數據？因為「將各式各樣的私人數據集合起來，例如學習數據、醫療數據、生活型式數據等等，可以提升這些數據改善生活品質的價值，嘉惠個人生活」（Expert Panel on the Utilization of Educational Data, 2021, p.24）。個人終其一生，都在創造可讓

自己終身受惠的學習紀錄。

為應「個別優化學習」之需，該蒐集那些個別化的私人數據？首先，客觀、量化的學習結果，如測驗得分、數位練習的學習過程等，會記錄下來。其次，主觀、質性的數據，也會保存下來。舉例來說，包括教師上午檢查各個學生的健康狀態、教師對每個孩子日常生活的觀察、兒童上學校醫務室的紀錄、以及教師在學期成績報告卡上對各個孩子的評語等。如此多樣廣泛的數據蒐集工作，學校都會按計畫推動。

順帶一提的是，有人說，日本中央政府在省、廳之間，有堵高牆。2021 年九月，為回應「數位轉型」（DX）尚未跨過高牆（缺乏進展）之批評，內閣成立數位廳（The Digital Agency），作為教育大數據使用事宜的跨部會意見交換中心。總務省（The Ministry of Internal Affairs and Communications）、文部科學省、經濟產業省（The Ministry of Economy, Trade and Industry）皆參與其事。2022 年 1 月，數位廳展望 2030 年，發布《教育數據使用準則》，規定「教育領域承擔的數位轉型任務，是在開創一個不論何時、何地，或和誰在一起，人人皆可依照自己方式進行學習的社會」，是以數據之範圍、品質和組合等「三條軸線」，須予妥善設定，並且「有關教育大數據之配置與聚集，亦須先期提出整體設計（架構（圖像））」（Digital Agency, 2022）。

根據上述《準則》，教育大數據不僅可用於中小學教育，從終身學習的觀點來說，復可用於幼兒教育、高等教育以及職業訓練。在這種情況下，私人公司行號也會得利，因為他們能夠提供

品質較佳的教育材料及服務。

如此看來，教育大數據似乎可比神奇的魔杖，本事廣大，既有助個體終身學習、減輕教師工作負擔、開發有效教學方法，亦可促進以證據為基礎的政策研訂等。對此，有人這麼形容，大數據的好處，無所不在，我們的未來，無限美好。

肆、培育數據科學家

為了促進 DX through AI，我們需要充足的數據科學家。文部科學省響應「社會 5.0」政策，於 2016 年成立「強化數學與數據科學教育委員會」，並在同年出版《強化大學數學與數據科學教育基準》一書。這份報告書指出，「運用數據分析做決策的公司行號，世界平均達 61%，可是日本卻僅有 40%」（The Commission on Strengthening Mathematics and Data Science Education, 2016, p. 1）。文部科學省因而宣告致力開發「具備數學思維及數據分析能力的人力資源」，以「振興日本的國際競爭力」。在此明確目標下，所推行的具體措施有三：（一）設置「數據科學教育研究中心」（暫用名稱），（二）研訂標準化課程與教材，（三）發展產學合作網絡，加強實用教育。於是，選定北海道大學、東京大學、滋賀大學[7]、京都大學、大阪大學、九州

[7]「滋賀大學之能獲選，不太尋常，因為其他獲選的機構，都是二次世界大戰之前屬於帝國大學系統的大型研究大學，而滋賀大學是所地方型大學。其之所以獲選的原因，應是該大學 2017 年成立了日本第一個數據科學學院。

大學等六所大學，先行試辦產學合作聯盟，日後再予推廣到所有高等教育機構。

日本社會卯足全力打造「社會 5.0」並推動 AI，在此政策下，文部科學省切入高等教育地帶，加強數據科學教育，以培養數據科學人才。迄今 2022 年為止，已選定 11 所核心機構以及 18 所特定領域機構，且已展開第二階段的聯盟結盟工作。目前加入聯盟的成員 ，共有 140 個機構，已開發數種有關數學、數據科學、AI 的課程模組、教科書及教材。

主管整個日本社會 AI 戰略的「內閣府」，也會涉入高等教育的相關政策。2019 年時，該府之「促進統合創新策略理事會」發布《2019 AI 戰略：適用全民、產業、地區及政府的 AI》報告 書（Council on the Promotion of Integrated Innovation Strategy, 2019）。報告書第 1 頁便表明，就「為未來奠基：教育改革與研發系統之重建」而言，「AI 是促成數位轉型的主要推力之一。我們越來越需要那些能為永續發展的未來社會，設計合用商品與服務，從而創造新價值的人力資源」（ibid., p. 8）。AI 人力資源的訓練與培育，已迫在眉睫，特別是在高等教育階段，所有大學及技術學院學生之目標，「不論主修科系為何，都須習得最基本的數學、數據科學及 AI 技能」（ibid., p. 12）。此處值得一提的是，政府現已主導設立一個系統，用以認證大學及技術學院中的學程，何者表現優異。

為了推動這個認證系統，2019 年成立「數學、數據科學及 AI 學程認證系統審查委員會」（The Review Committee on

Certification System of Mathematics, Data Science, and AI Education Program）。該審查委員會 2020 年先建立「素養級」（The Literacy Level）認證，2021 年再建立「基礎應用級」（The Basic Applied Level）認證。依照此一認證系統，2021 年認證了 78 個「素養級」學程（MEXT, 2021），2022 年將會認證 138 案。至於「基礎應用級」，2022 年會認證 68 案。不久後，大學及技術學院之數據科學教育，將日趨普及和進步。

《2019 AI 戰略》展望各級教育階段之 AI 人力資源開發，列有 2025 年必須達成的目標值。據此，每年應該取得中等程度之「素養級」認證的畢業生，中小學約 1 百萬人，大學及技術學院則約 50 萬人。其次，大約 25 萬人，包括半數的大學及技術學院畢業生和少數的中學畢業生，應該完成「基礎應用級」認證。此外，就研究生及青年研究人員[8]來說，每年希望有 2 千人通過「專家級」（The Expert Level）認證，1 百人通過「頂尖級」（Top Class Level）認證；不過，這兩個層級的認證，尚未實施。

日本的教育政策，意欲及早趕上 AI 先進國家的腳步。在中小學教育階段，AI 用於個別優化教育及學習，以開發能夠創造新

[8]「2020 年以來，新冠肺炎疫情的蔓延，進一步加速了 DX through AI 相關教育政策的推展。2020 年，首相官邸設置了「內閣大臣數位改革協商會」（Ministerial Conference on Digital Reform）；同年，文部科學省也設置了「數位化促進總部」（Headquarters of Digitalization Promotion），由文部科學大臣主持，成員包括四位次官及各局處主管（MEXT, 2020）。就教育領域促進數位化這個目的來說，討論項目如下：數學、數據科學及 AI 教育的齊頭並進；結合現場及線上的混成學習，推動高品質教育；電腦化測驗（CBT）在大學入學考試的使用等。高等教育的研發工作，要以促成上列事項作為主要標的。

價值的人力資源。在高等教育階段，則讓人人都可習得數據科學的知識和技能。

伍、政府的危機感

自 2010 年代以來，在教育領域推動 DX through AI 政策的背後，有著強烈的危機感，擔心日本社會已在 DX through AI 方面有所落後。總務省出版的一本研究報告《資訊暨通訊科技之演進對就業與工作型式造成衝擊的調查研究》(Ministry of Internal Affairs and Communications, 2016b)，係以問卷調查日本工人對於 AI 的態度，並比較其與美國工人的異同。其中，可發現三項有趣的研究結果及政府評論。

首先，63.1% 的日本工人和 51.9% 的美國工人表示，他們的工作場所從未導入 AI，而未來也沒看到任何導入的計畫。兩國之間，差異甚大。接下來是道較長的題目，問的是：「AI 未來將導入許多不同的工作場所，舉凡工作型式及日常運作的內容與範圍，以及工作所需的知識和技能，預期都會發生變化。你想做些甚麼準備？」46.7% 的美國工人回應，「他們想要取得新的 AI 知識及技能，以延續目前的工作」，可是只有 28.0% 的日本工人做出相同回應。另方面，51.2% 的日本工人回答，「他們不會特別做些甚麼」，可是只有 22.8% 的美國工人如是說。政府對於這些發現的評論如下：「日本工人因應 AI 的危機感及動機，都偏弱。不久的未來，AI 一定會穿透社會，四處擴散。我們應該感到

恐懼，許多日本人無法適應此一趨勢，跟不上未來新社會的進步，遠遠落隊」(Ministry of Internal Affairs and Communications, 2016b, p. 41)。

其次，有道問卷題目問到：「未來，你想學的是那種 AI 使用技能？而你想讓孩子學的，又是甚麼？」38.5% 的日本工人說，「他們不想學任何特定的 AI 技能，也不想讓孩子學」，這個比率遠超過美國工人的 15.2%。接著的題目，是請問卷填答者從「AI 技能表」選取他們想要學習的 AI 技能。美、日工人想學的技能當中，最大的差異，在於「應該如何使用 AI 之創造力及設計力」（日本 22.4% ＜美國 41.5%）。政府對此的評論指出，「日本必須盡快推動 DX through AI，也必須發展策略，激勵日本工人提升學習 AI 技能的動機。否則，我們將輸掉世上的 AI 競爭」(ibid., p. 47)。

第三，關於「表列項目當中，你需要何種學習環境或支援系統，以協助獲取 AI 技能」這個問題，整體來說，美國人的回答率高於日本。為提升日本人的 AI 技能，政府一向強調教育以及設置公共支援系統的重要性，因為「要公司行號改善 AI 環境，以支援員工自我成長，有其限制。公共教育的角色，特別是義務教育，有助青年正面學習有關 AI 的能力、態度和立場，消弭他們對 AI 的排斥感」(ibid., p. 48)。

總之，上述研究報告，瀰漫著恐懼感和危機感，譬如，報告提到「若缺乏危機感和使用 AI 的動機，日本與美國在 AI 使用方面的差距，將會持續擴大」(ibid., p. 47)。日本的 AI 政策，是先

引發防止日本變成 AI 低度開發國家的議題，然後展開有關 AI 人力資源必備之技能，以及培育這類人才之理想教育型式的討論。

此外，經濟合作開發組織（OECD）2018 年 PISA 之實施結果，也為政府帶來巨大震撼。因為日本兒童接受教育，使用 ICT 資訊暨通訊科技的情形，幾乎是全部參與測驗國家當中最低的。舉例來說，日本只有 4.0% 的學童「每天」或「幾乎每天」「使用電腦做家庭作業」，可是卻有 78.8% 的學童「從未或幾乎沒有」如此做。OECD 國家的平均數值，是 22.4% 的學童「每天」或「幾乎每天」「使用電腦做家庭作業」，22.1% 的學童「從未或幾乎沒有」如此做。這並不表示日本學童不使用 ICT，有 47.7% 的日本學童「每天」或「幾乎每天」「玩單人電腦遊戲」，這是參與 PISA 測驗國家裡頭比率最高的，其他有 26.6% 的學童「從未或幾乎沒有」這麼做。OECD 國家在這方面的平均數值，是 26.7% 的學童「每天」或「幾乎每天」「玩單人電腦遊戲」，32.5% 的兒童「從未或幾乎沒有」這麼做（National Institute for Educational Policy Research, 2019）。很明顯的，日本的學童是校外使用 ICT 者眾，校內使用 ICT 者寡。這就是為何教育領域之使用 AI，得以成為一項重大政策議題的原因，大家都期望日本能夠擺脫 AI 落後者的地位。

陸、政策陷阱

「個別優化學習」、「建構大數據」、「培育數據科學家」

等等教育政策，都在加速推動，無人反對。這不難理解，因為它們都是當務之急。然而，我們亦需慎思，難道這些政策帶來的都是好處，還是已有可見的隱憂。

一、個別優化學習

首先，「個別優化學習」蘊含的兩個概念：即「個別化的教」和「個別化的學」，在實務上落實的可能性若何？以「個別化教學」（Individualized Teaching）來說，目的之一是在減輕教師工作負擔。AI 可以找出個別學生在「學科」方面的學習困難，並為教師提供有效的教學參考意見。然在「學科」之外，AI 能否為學生整個「日常生活」提供輔導，不無疑問。日常生活裡，沒有甚麼是一定對的，涉及人際互動的問題，只能就事論事，因事制宜。目前的 AI 科技，能夠處理這些事情嗎？

「單一用途之人工智慧」（Single Purpose of Artificial Intelligence），可用來處理單一特定事務，例如機器翻譯及西洋棋軟體，它們的表現不比人差。至於「通用人工智慧」（Artificial General Intelligence, AGI），則像人類一樣可以同時處理多種不同事務， 並提供解決之道，可是這種 AI 尚未問世，也不清楚未來何時才會出現。儘管人類和 AI 都可從過去的數據，找到解決眼前問題的方法；不過，AI 僅能依據過去數據之統計概率，給出答案（Nishigaki 2016）。目前的 AI，還無法對複雜的人類議題，進行綜合判斷，理出頭緒。

藉助 AI 科技的教育（AI-based Education），最大的亮點，在於「個別化的學」。很確定的是，在當前一個班級 40 位學生的狀況下，想要提供「個別化的教」，是有困難的。每位學生人手一具平板電腦，看似可以有效解決這個問題。但我想知道，是否所有的學童都有自主學習的動機。研究顯示，兒童之學習動機與學習表現之間，互有相關，所以個別化學習，恐擴大兒童學習表現的差距，因為學生的學習動機不必然相同。另一項疑慮是，習於 AI 提供適當學習內容與方法的兒童，其學習型式恐流於被動。若然，兒童何以自動向學？

二、大數據宰制

教育大數據的賣點，在於它不僅是學校教育的利器，也是終身學習的利器。然而，它也可能變成控制個人生活的工具，以下就其三項主要問題說明之。

第一，目前尚不清楚是誰掌控整個數據結構。2021 年「專家小組」提出的《期中總結報告》，並未敘述由誰負責管理數據，惟（2022 年之）《教育數據使用準則》提出補充說明：政府係以「分散」而非「集中」的方式，管理數據。如此一來，假如發生任何問題，該誰負責？問題又該如何解決？尤其是所使用的數據，主要屬於「專家小組」所界定之可辨識私人身分特徵的數據時，在管理上更需謹慎，以維安全及隱私，但相關的規定，卻都含混不清（Information Law Research Institute, 2022）。

第二，由於缺乏公制，數據格式不一，以致無法進行數據的比對。例如，教師對於學生健康狀態以及日常生活的觀察，主觀成分居多，數據因而存有「觀察者偏差」，師師不同，校校有異[9]。

第三，透過可辨識私人身分特徵的數據，只要幾個步驟，就可將個體標示出來。譬如，個人會因過往的負面資訊，貼上汙名標籤，造成現在，乃至未來的評價跟著走低（Saito, 2016; Stephan Jones, 2021）。猶有進者，即使是從大量「匿名」數據當中挖掘出來的某種趨勢，亦可用以預測某位單一個體的未來。舉例來說，假如有個集體趨勢指出：「過去學業成就偏低的兒童，較不可能進入名牌大學」，那麼這項趨勢亦適用於某位（成績不佳的）特定個體，讓他 / 她不再參酌自己的願望，來選擇自己的生涯，因為大數據顯示，成功的可能性不高。然而，兒童的成長通常不可預測，可是 AI 所預測的未來，依據的卻只是已發生過的往事。

柒、日本何去何從：討論

日本近年的政策，認為教育領域之導入 AI，是件無可爭論的當為之務。大家之有這樣的看法，理由有二：一是可為教育現行面臨的挑戰，提供解決之道；另一是唯恐日本或將輸掉國際競爭

[8] 當「專家小組」設立時，內閣府「日本學術會議」（The Science Council of Japan）轄下有個委員會，也在討論教育數據的使用。2020 年九月，提出《基於教育數位化之學習數據使用建議書：邁向以證據為準的教育》（Science Council of Japan, 2020）。雖然該建議書對於如何蒐集及使用私人資訊，也曾表達關切，但調子嫌弱，細節也不明確。

的危機感。不過，這般信賴 AI，似乎過於樂觀。AI 並非如此萬能，就像美國常有人說，AI 所提供的分析，可能以偏概全，因為 AI 蒐集的數據庫，本即有所偏誤（Yokoyama 2021）。設若最初投入的數據，即有偏差，最後產出的結果也一定會有偏差，可是 AI 不會告訴我們，其中存有偏差。我們必須考量 AI 目前在功能上的限制，也須考量人們應該如何判斷行止。若只是因為日本落後其他國家，就一心想要趕上 AI 先進國家，與其如此，不如細思一句格言：「預防勝於治療」。

參考文獻

Cabinet Office (2016) *Science and Technology Basic Plan* https://www8.cao.go.jp/cstp/kihonkeikaku/5honbun.pdf (Retrieved August 31, 2022)

Cabinet Office (2021) *Science, Technology and Innovation Basic Plan* https://www8.cao.go.jp/cstp/kihonkeikaku/6honbun.pdf (Retrieved August 31, 2022)

Central Council for Education (2021) *Aiming to build a 'Japanese-style school education in Reiwa': Realization of Individualized and Optimized Learning and Collaborative Learning that Brings Out the Possibilities of All Children*, https: //www.mext.go.jp/content/20210126-mxt_syoto02-000012321_2-4.pdf (Retrieved August 31, 2022)

Commission on Strengthening *Mathematics and Data Science Education (2016) Measures to Strengthen Mathematics and Data Science Education at Universities*, https://www.mext.go.jp/b_menu/shingi/

chousa/koutou/080/gaiyou/__icsFiles/afieldfile/2016/12/21 /1380788_01.pdf (Retrieved August 31, 2022)

Council for Science, Technology and Innovation, Cabinet Office (2022) *Policy Package on Education and Human Resource Development for the Realization of Society 5.0*, https://www8.cao.go.jp/cstp/tyousakai/kyouikujinzai/saishu_print.pdf (Retrieved August 31, 2022)

Digital Agency/Ministry of Internal Affairs and Communications/MEXT/Ministry of Economy, Trade and Industry (2022) *The Roadmap for the Utilization of Educational Data*, https://www.digital.go.jp/assets/contents/node/information/field_ref_resources/0305c503-27f0-4b2c-b477-156c83fdc852/20220107_news_education_01.pdf (Retrieved August 31, 2022)

Expert Panel on the Utilization of Educational Data (2021) *Fixing Issues on the Utilization of Educational Data (Interim Summary)*, https://www.mext.go.jp/content/20210331-mxt_syoto01-000013887_1.pdf (Retrieved August 31, 2022)

Fujikawa, Hiroyuki (2021) "Research Trends and Prospects for ICT Education," *Studies in Education*, Department of Educational Sciences, Graduate School of Education and Human Development, Nagoya University, No. 64, pp. 15-30.

Council on the Promotion of Integrated Innovation Strategy (2019) *AI Strategy 2019: AI for All People, Industries, Regions and Governments,* https://www8.cao.go.jp/cstp/ai/aistratagy2019.pdf (Retrieved August 31, 2022)

Japan Institute of law and Information Systems (May 15, 2022) "Thinking about Japan's Education Log: Privacy Freak Cafe #16 (Part 1)," https://cafe.jilis.org/2022/05/15/347/ (Retrieved August 31, 2022)

MEXT (2018) *Toward the Full Use of Advanced Technology to Support Learning in the New Era: Shibayama Learning Innovation Plan,* https://www.kantei.go.jp/jp/singi/keizaisaisei/miraitoshikaigi/ dai22/ siryou3.pdf (Retrieved August 31, 2022)

MEXT (2019) *Measures to Promote the Use of Advanced Technology to Support Learning in the New Era,* https://www.mext.go.jp/component/ a_menu/other/detail/__icsFiles/afieldfile/2019/06/24/1418387_02 .pdf (Retrieved August 31, 2022)

MEXT (2020) *Digitization Promotion Plan of the Ministry of Education, Culture, Sports, Science and Technology*, https://www.mext.go.jp/ content/20201223-mxt_kanseisk01-000010143_2.pdf (Retrieved August 31, 2022)

MEXT (2021) *Overview of Certification System of Mathematics, Data Science, AI Education Program (Literacy Level)*, https://www.mext. go.jp/content/20210315-mxt_senmon01-000012801_1.pdf (June 5, 2019)

Ministry of Internal Affairs and Communications (2016a) *White Paper on Information and Communications,* pp. 232-241, https://www.soumu. go.jp/johotsusintokei/whitepaper/ja/h28/pdf/n4200000.pdf (Retrieved August 31, 2022)

Ministry of Internal Affairs and Communications (2016b) *Survey Research of the Impact of Evolution of ICT on Employment and Working Styles,* https://www.soumu.go.jp/johotsusintokei/linkdata/h28_03_ houkoku.pdf (Retrieved August 31, 2022)

Miwa, Yokoyama (2021) "What We can Learn from the United States about AI and Race/Gender Issues, "*Journal of Industry-University Collaboration*, Japan Science and Technology Agency, December

2021, https://www.jst.go.jp/tt/journal/journal_contents/2021/12/ 2112-02_article.html (Retrieved August 31, 2022)

National Institute for Educational Policy Research (2019) *OECD Survey on Student Learning Achievement (PISA2018): 2018 Survey Supplementary Materials* https://www.nier.go.jp/kokusai/p i sa/pdf /2018/06_supple.pdf (Retrieved August 31, 2022)

Nishigaki, Toru (2016) *Big Data and Artificial Intelligence: Identifying Possibilities and Traps*, Chuko Shinsho

Science Council of Japan (2020) *Proposals on Utilization of Learning Data Based on the Digitalization of Education: Towards Evidence-Based Education*, https://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-24-t299-1.pdf (Retrieved August 31, 2022)

Stephan, Jones (2021) "27 Million People will be unable to Find Jobs due to AI Tools: The Automatic Resume Screening System will Turn the Doors Away," *BUSINESS INSIDER* https://www.businessinsider.jp/post-241970 (Retrieved August 31, 2022)

Takechi, Kiyoshi (2019) "Laborers at the Mercy of Selecting by Artificial Intelligence: What should the Law Do?" *Fudai Keizai Ronshu,* University of Toyama, Vol.65 No.2, pp. 91-110, https://://core.ac.uk/download/pdf/275767046.pdf (Retrieved August 31, 2022)

Yamada, Hiroyuki (2018) "Internet Society and Education: The Myth and Reality of Changing Education," *Frontier of Educational Sociology 2: Changing Society and the Future of Education*, Iwanami Shoten, pp. 249-267.

Zhang, Jian (2019) "Ethical Issues Concerning Educational AI: Focusing on 'Educational Judgment'," *Annual Report of The Research Institute for Science and Technology, Tokyo Denki University*, No. 17, pp. 31-

36. https://core.ac.uk /download/pdf/327150449.pdf (Retrieved August 31, 2022)

2

Education Technology for Collective Intelligence

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Contents

Abstract

The big challenges we face at the moment stem from human activity that has not been collectively intelligent. Global warming is just one of the effects of the 'Anthropocene', described as the epoch when human activity has an impact on the fate and future of the planet as a whole. It is not a coincidence that this new epoch coincides with the global spread of the Internet. Although it offers great potential the Internet is now widely seen as a threat due to the way its use facilitates misinformation and polarisation. In this talk I argue that the best way to respond to these challenges is through the design of education with technology to promote collective intelligence.

I offer some illustrations of how we can do this and build on what has been learnt from research to put forward a set of principles for the design and practice of education technology. I end with a proposal for a programme of research and development towards the creation of a coherent global education system for a more collectively intelligent future.

1 - The challenge we face

The advent of the Internet Age in a cultural historical timescale, and the advent of Anthropocene in a geological timescale, both raise serious challenges for humanity. The Internet, which has emerged in recent decades as the new dominant mode of communication, has brought the majority of the human race together in what is essentially a single medium with the possibility of real-time two-way dialogic interaction. This is an extraordinary advent which has brought with it many challenges. Initially seen as a potential support for democracy, the Internet is now more commonly referred to as a threat to democracy with global social media platforms such as Facebook accused of encouraging extremism and the spread of 'fake news'. Part of the problem seems to be that algorithms designed to boost advertising revenue reward extreme views, with messages expressing outrage getting more visibility and ‘likes’ than more moderate messages, in addition to social media often promoting ‘echo chambers’, in which those with the same views are grouped together by a pattern of mutual liking that excludes diversity, challenge and development. In relation to education the Internet is accused of disrupting the cognitive development of children by encouraging distraction and leading to a shorter attention span (Carr, 2010; Greenfield, 2015). There is also a fear that the Internet is leading to families

who are ‘alone together’, each on their mobile phones instead of talking together and so producing young people who are not able to connect to others except superficially (Turkle, 2011).

These concerns about democracy and childhood socialisation are aspects of one big challenge of our time which is managing the transition from multiple separate print-based cultures to a single global Internet based culture. It is not coincidental that this transition to the Internet Age in cultural historical timescale, corresponds to an increasing awareness of the dawn of the Anthropocene in the much larger geological timescale. The Anthropocene is the idea from geography that the planet Earth has moved into a novel geological epoch characterized by human domination of the planet. Effects like global warming show that what we humans do is now impacting on the quality of our environment such that collective self-regulation on a planetary scale has become essential if we are to continue not only to thrive but also, perhaps, simply to survive. The Anthropocene offers challenges to the future that imply the need for us to collaborate together across different countries in order to understand and to solve problems such as global warming which cannot be solved by any individual country acting alone. This suggests a need to design education to promote a possible global collective intelligence of the future. We argue that a better theory of dialogic education with technology might help us address the challenges posed both by the Internet Age and by the Anthropocene.

2 - What is education?

If we look at how the term education is most commonly used we find that it refers to the education system of schools, colleges and universities

and is dominated by the closely linked ideas of literacy and numeracy. Despite the advent of the Internet Age, basic education still tends to be seen as reading, writing and arithmetic and more advanced education still tends to be seen as mastering the knowledge contained in books (Pea & Cole, 2019).

To step back and take a more theoretical view of education it helps to consider how education happens in different cultures and in different times. Oral cultures, for example, understand education in a different way.

In oral societies education tends not to involve schools and nor does it involve the idea of knowledge in the form of representations that can be transmitted and stored in memory. As well as apprenticeship education through personal relationships (Rogoff, 2003), most oral societies have initiation ceremonies drawing young people into a living relationship with more generalised cultural voices sometimes referred to as the ancestors (Turner, 1987). There is usually overlap between what might now be classified as education for productivity and education for cultural identity. Every activity in most truly oral cultures, involves initiation into a living relationship with the appropriate ancestor. Malinowski brings out how the symbols of ancestors carved in the prow of fishing canoes in Melanesia were conceived as an essential part of the productive technology (Malinowski, 1922/2013, p 116). In a similar way the so-called 'songlines' of Australian aborigines embed much useful productive knowledge in the form of a relationship with the land, animals and plants and with the ancestors who first made the trails referred to. Education into the songlines is not conceptualised as learning a store of useful representations but as learning to hear the voices of the ancestors as they sing to the tribal member through

features of the landscape. (Watson & Chambers, 1989).

Stepping back to take a theoretical stance enables us to see the more general pattern that underlies both education in oral cultures and education in print literate cultures. Education can be characterised as guided induction into participation in the temporally long-term and spatially widespread dialogues of culture of which knowledge is an aspect. Knowledge cannot be separated from dialogues as it takes the form of answers to questions that are asked within dialogues and answers change when the questions change as the dialogue develops. Education has two main interconnected functions: identity formation and the continuity of cultural practices. Guided induction into cultural long-term dialogues enables biological individuals, newcomers to the community, to learn how to become 'fully' human (i.e. culturally human as well as biologically human) by appropriating the culture which usually means learning how to talk with the ancestors, and find one's place amongst them. Guided induction into cultural practices is closely related to identity formation, it is about learning how to use the tools and techniques handed down by the ancestors and how to participate in dialogues about their use. In both of these two strands, identity and practice, each generation explores and learns, both consciously and unconsciously, adding a little more to the stories and to the technologies of the culture and transmitting this extra to succeeding generations.

3 - Education for collective intelligence

Existing education systems focus almost exclusively on developing individual knowledge and individual ability to perform well in examinations, they do not spend much effort if any on developing collective intelligence.

This is a problem because having to work together with geographically distant others online to solve problems is now a very common aspect of almost every professional job. Learning to Learn Together Online (L2L2O) is becoming essential in every area of life. Our recent experience of scientists and policy makers from every country around the world collaborating to defend the human race against the COVID 19 pandemic is a striking example. The recent successful global collaboration against the threat of a hole in the ozone layer and the need now for collaboration to counter the challenge of global warming indicate that education for collective intelligence is not just something useful for small teams, it may be essential now if we - the human race as a whole - are to survive and continue to thrive.

Defining Collective Intelligence

A lot of work on measuring individual human intelligence in psychology has led to a focus on 'g factor', described as the overlap between ability on a range of tests. In other words intelligence is understood as general thinking ability, not just being good at one task but being generally good at learning new things and solving new problems in a range of different contexts. This is interesting because, if we follow this definition, it is clear that Artificial Intelligence (AI) is still just a fantasy. We have clever tools built to do specific tasks efficiently but as yet no software that shows an ability to think well generally across a range of domains and tasks. On the other hand we do have evidence of general intelligence for groups. Instead of focussing so much energy on the fantasy of autonomous AI machines we might do better to focus our efforts on the much more real and

effective intelligence that we know we can achieve through combining smart technology with human groups.

Anita Woolley and a team at MIT investigated lots of different groups doing lots of different kinds of tasks and came up with what they claimed to be a robust measure of group intelligence which they called 'c':

> ‘By analogy with individual intelligence, we define a group’s collective intelligence (c) as the general ability of the group to perform a wide variety of tasks. Empirically, collective intelligence is the inference one draws when the ability of a group to perform one task is correlated with that group’s ability to perform a wide range of other tasks’ (Woolley et al 2010)

What was perhaps most interesting about this study is that the group intelligence did not correlate with the individual IQ scores of group members but it did correlate with a measure of individual 'social sensitivity'. In other words optimising group intelligence shifts the focus onto the value of so called 'soft skills' or social and emotional skills that make people good at understanding each other and good at working together in a team.

Adding wisdom back in to 'intelligence'

When Gary Kasparov, the Chess champion of the world, was beaten by an AI computer programme, deep blue, he went away, sulked for a bit, then came back with an ingenious new approach to chess. A team or assemblage consisting of a human chess player and a non-human computer chess player. He called this a centaur. As one would expect this combination proved better than any human alone. More interestingly it also proved better than any computer player alone. The human players brought something valuable to

the match - their non-algorithmic creativity.

When we talk about intelligent machines we are usually using a rather limited definition of intelligence. We call machines intelligent if they can solve problems fast and effectively. But the problems have to come from somewhere. The etymology of the word intelligence suggests that its more originary meaning is related to the selecting of goals, not only to the achieving of goals. Intelligence originally meant the contextual wisdom to say the right thing but now it often only means being quick and accurate in solving a problem. Even in order to play a relatively simple game like chess well humans are useful as part of a cybernetic system using foresight to choose wisely between different options. Computers are also needed to do the data crunching and work out the consequences of different options. This combination is unbeatable. Collective intelligence combines humans and technology in systems that are not only fast at achieving goals but are also able to generate wise goals and select between goals in relation to the overall aim of maximum flourishing.

4 - Case studies and illustrations

For many years now I have been working with colleagues to develop and evaluate ways of teaching for collective intelligence. The Cambridge Educational Dialogue Research Group (CEDIR) has many tried and tested resources to promote effective group 'thinking together' https://www.educ.cam.ac.uk/research/groups/cedir/ and https://thinkingtogether.educ.cam.ac.uk/ some of these resources are also available in Mandarin Chinese (email CEDIR from their website).

I am confident in calling our approach to teaching in primary schools,

'thinking together', as a programme to teach collective intelligence as we measured the impact of our pedagogy using non-verbal reasoning tests of a kind that get results correlating well with general IQ. After ten weeks of lessons on how to talk together effectively for thinking together groups did much better on the test (Wegerif, Mercer and Dawes, 1999)

Augmenting Collective Intelligence with smart tools

Thinking together in small groups is a good start but it is not enough. For many problems we also need to get larger groups thinking together. This is where smart tools are needed.

In a way we have always had technology supported collective intelligence for a long time. Both literacy and mathematics are technologies that have supported large scale collective thinking. Writing thing down enables ideas to be shared across space and it also enables collaboration in thinking over time. Collective Intelligence supported by technology has been behind all of our successes in science and technology as well as in art and philosophy. However, much of this collective intelligence has emerged in an apparently random or spontaneous way. The question is, 'is it possible to design for collective intelligence?' More pertinently, 'is it possible to design education plus communications technologies to be better at supporting both small group thinking and larger scale collective thinking?' I think that it is possible and that we should do this. Below I offer a few examples of how smart technology has been used to support collective intelligence before going on to show how spart technology can be used to support education for collective intelligence.

Swarm-AI and Pol.is - bringing people together

Social media platforms such as Facebook and Twitter seem to reward the more extreme views and so are said to lead to polarisation. Several software systems have now been developed to do the opposite, bringing people back together.

Swarm AI is one example. Swarm intelligence algorithms moderate the interaction of a group of individuals who are deciding between a set number of options. Individuals connect with each other and AI agents to form a closed-loop system where both the machine and individuals can react based on the behaviour displayed by others to change or maintain their preference. This collective 'thinking together' approach, modelled on the way that some animals 'swarm' together, has been shown to improve decision making in a range of areas.
(https://www.nesta.org.uk/feature/ai-and-collective-intelligence-case-studies/swarm-ai/)

Pol.is is another AI supported online debate and decision-making system that already has many examples of success.

Pol.is produces a map of where people are in any dialogue. As a result they can see if they share opinions or if they are at an extreme. The result is to encourage people to find common ground and converge on a shared solution through dialogue that involves deepening their understanding of key divisive issues and seeking creative emergent solutions that as many as possible can buy into.

Pol.is has been used in many contexts now including to support improved democratic decision making in Taiwan where it was introduced by

digital minister, Audrey Tang. (https://hbr.org/podcast/2020/10/how-taiwan-is-using-technology-to-foster-democracy-with-digital-minister-audrey-tang)

How Pol.is really works is I think closely related to how dialogic identity expansion works. When an individual writes an opinion in a Pol. is debate that individual is naturally focused on what they think coming out of their experience. However, stepping back and looking at the map that situates their input in relation to all the others, they naturally then are forced to take on the perspective of the dialogue as a whole. What develops from this is a more dialogic identity, both my voice on the inside talking outwards but also seeing or hearing the perspective of the dialogue as a whole, as if from the outside looking inwards to define and locate my voice as just one voice amongst others. In this process the individual does not lose their identity in the collective but they expand their sense of identity to take into account the point of view of the collective. They become more dialogic selves - double-voiced - self as a continuous dialogue between inside and outside point of view. Shifting from either ego based identity (I need to win the argument) or collective based identity (group harmony must not be disturbed) into a more dialogic identity (I can see both sides) is a key aspect of successful group thinking. (see https://www.rupertwegerif.name/blog/what-is-a-dialogic-self)

Edubots, guiding and focussing the dialogue

Edubots, artificial conversational agents used as tutors, have been shown to have a useful role in supporting online learning dialogues. Bots can be used to welcome people, invite them together into groups, tell bad bot

jokes to warm them up, challenge them to think more clearly, invite quiet participants to speak more and generally police and improve the educational quality of interactions. Edubots might be a valuable support for collaborative learning in MOOCs or Massive Open Online Courses (see review in Tegos, Mavridis & Demetriadis 2021). Agent-Supported Peer Collaboration in MOOCs. Frontiers in Artificial Intelligence, 4 https://www.frontiersin.org/articles/10.3389/frai.2021.710856/full)

Metafora: Learning to learn together

In the large EU funded Metafora project I led a team developing what we called a Visual Language for Orchestrating Group Learning. This was a planning and reflection map that groups could use to plan their shared inquiry. Science teachers found it particularly useful as a support to help students think more about how scientific investigations work the importance of literature review, building models, testing models etc. The overall system integrated use of this visual language with a more free-form dialogue area and also with microworlds where ideas could be tested out. Imagine, for example, a simulation of climate change and students working together to develop and test out different potential solutions. (https://www.researchgate.net/publication/289619416_The_metafora_tool_Supporting_learning_to_learn_together)

Argunaut: An Intelligent Guide to Support Productive Online Dialogue

In Argunaut, another EU project we developed systems to enhance e-moderation of small groups online. This combined the development of a moderator's dashboard with the automatic monitoring of the quality

of dialogue in small groups online in order to provide feedback to the moderators and to the groups. From the dashboard the moderator could see indicators of the quality of talk in each group, whether the participation was even and what kinds of things were being said. Rather more excitingly we were able to analyse the quality of the small group interaction and use this as a basis for feedback to the groups.

We coded the quality of dialogue in our dynamic concept mapping environment (Digalo) as follows:

1. critical thinking with its focus on claims, counterclaims and reasons (D1)
2. creative reasoning understood as a sort of dance of perspectives (D2)
3. dialogic engagement which includes not only addressivity and expressions of empathy but also expressions of doubt, changes of mind, ventriloquation (the presence of another voice within an utterance) and elicitation of the views of others (D3).
4. moderation through encouragement and the scaffolding support of recapitulations, reformulations and evaluations (D4).

Using datamining techniques we were able to get robust automatic coding of both reasoning and creativity. In the shallow loop of Argunaut the moderators could see quality inidactors and intervene with a series of comments. The idea of the deep loop of Argunaut was that the quality indicators were constantly being evaluated and improved as were the guiding comments. This would have depended on a large community of users and we did not get beyond basic proof of concept but the idea is exciting.

Imagine you are an online teacher with 20 or 100 groups of 5 to 8

students. You have a dashboard that enables you to visit each group and make suggestions. Natural language processing datamining (AI) tells you indicators that might relate to the quality of interaction occurring in each group and suggests a prompt into the room eg ‘could you see this differently?’ or ‘what do you think, John?’. You could look in more detail at the group before deciding or not to intervene with a comment or you could let the machine decide for you. The impact of each such intervention is monitored by AI and fed back to constantly improve the overall performance of the system.
https://www.researchgate.net/publication/228479459_Facilitate_the_facilitator_Awareness_tools_to_support_the_moderator_to_facilitate_online_discussions_for_networked_learning

5 - Principles for the design of education technology

The theory of education technology that we propose as a foundation for design is taking dialogue seriously and designing for expanding dialogue. This theory if more a foundation for design than it is a design framework. It is a way of thinking about education which will inform different design frameworks in different contexts.

Provisionally and tentatively we proposed a loose design framework for education technology consisting of a set of connected ideals:

1. design for participation: use technology and pedagogy to give students the opportunity to talk and engage in learning dialogues at all levels from dialogues in the classroom to global dialogues of culture

2. design for connection: opening and widening dialogic spaces that enable dialogic encounters with voices at different levels, the voices of individuals and the cultural voices of generalised others
3. design for expansion: building supports for a sustainable two-way dialogic interaction between dialogues at different time-scales from the short-term and local to the long-term and global.

Most of the research referred to as 'AI in education' is about accelerating individual learning using data-analytics and data-mining techniques to provide adaptive personalized learning trajectories. That has been done. What we need to do now is research how to use similar smart technologies to support collaborative learning and to teach for collective intelligence.

The examples I have given in this talk show the huge potential of technology to support better collective thinking and to support education for better collective thinking.

The following is a list of just a few ideas for research projects in increasing magnitude, it is not meant to be exhaustive, do please send me further ideas as comments to this blog.

1)We need a thorough scoping review of digital technology used to support collective intelligence in education. More than a review, also finding the areas of cutting edge development and interviewing projects leaders. Both horizon scanning and beyond the horizon scanning.

2)We could use Educational Design-Based Research (EDBR) on teaching thinking together off-line combined with moderated

small group learning of specific concepts in areas of the curriculum online. I am thinking Edubots facilitating learning dialogues in small groups possibly with some content knowledge to help select examples and some learning to constantly improve dialogues. Measures could be specific conceptual learning and also communication and dialogue skills

3)Develop the Argunaut deep-loop idea to improve machine awareness of and teaching for the educational quality of talk in small groups online.

4)Using tools like the Metafora visual language, in combination with teaching thinking together, to support challenge-based learning using challenges such global warming. The aim would be to raise awareness as well as to teach how to work in teams to solve problems and how to think like a scientist. If groups were selected from different regions a further aim would be global citizenship.

5)Develop a global platform to support education for developing our planetary collective intelligence. An education platform that anyone, anywhere with a smart phone could join, learn basic dialogue skills in small groups online or offline and then be led to join others in inquiring together into those challenges that most interest them. Every challenge would be supported by Open Education Resources with content knowledge. This would be a way to explore the possibility and potential of a different kind of education system, a global education system oriented towards preparing students to participate in designing the future.

Our current mainstream approach to education is not good for producing the collective intelligence that we need to solve the challenges of the future. The curriculum in most schools is like a person walking backwards into the future unable to see the threats ahead of them because their attention is focused only on the past. The knowledge and skills transmitted by schooling was clearly useful to somebody once but that is no guarantee that they will continue to be useful. Is it possible to turn this system around to face forwards, inducting students from the beginning of their lives into dialogues about the future and equipping them with the skills and the knowledge that they need to participate constructively in building that future? This is what designing education for collective intelligence means. We have some good ideas about how to start to do this but we cannot be sure of what will work. What we need now are careful design experiments, trying out new approaches to education supported by smart tools and seeing how they work out. That is what we are trying to do with the new Digital Education Futures Initiative at Cambridge deficambridge.org. Do please let me know if you think you can help.

6 - Designing the future

Education technology integrates the design of pedagogy and the design of technology. It is about the design of more dialogic selves as well as the design of technologically supported dialogic spaces. In a successful dialogue a collective identity forms which does not subordinating the constituent voices. On the contrary, when dialogue works well each participant feels expanded and enriched. The hope that I have for this

dialogic theory of education technology is that it might help to facilitate a direction of overcoming not only the apparent alienation between humans and other humans but also the apparent alienation between humans and technology. The vision motivating me is that an expanded dialogic collective consciousness might one day be able to appropriate the increasingly interconnected global network of technologies to promote a global flourishing that is more than simply human flourishing but is also the flourishing of the planet. It is as if we have been building a collective body together, a giant body with fiber-optic nerve ways connecting a vast number of powerful and wonderfully intricate sensing devices and productive machines. But this new giant that we have built together lacks a soul. Dialogic education with technology is about how we can grow together to become the collective soul needed to inhabit our new collective body. I began this paper with a rather negative story of how, if we want to continue to thrive and perhaps even to survive, we need to respond to the challenges presented to us by the Internet Age and by the Anthropocene. That is one way of looking at our situation, a reactive way. The pro-active alternative version of this same story is that the convergence of the Internet Age and the Anthropocene offer an extraordinary opportunity, a chance to create something that has never been seen before in history: a planetary-wide self-regulating organism. A dialogic theory of education technology is not going to achieve this epochal transformation all on its own. I put this theory forward as one small tool that might be useful: a foundation for the design of the kind of education needed if we are to flourish together in the future.

References

Carr, N. (2010). *The shallows: How the internet is changing the way we think, read and remember.* Atlantic Books Ltd.

Greenfield, S. (2015). *Mind change: How digital technologies are leaving their mark on our brains.* Random House

Pea, R., & Cole, M. (2019). The living hand of the past: The role of technology in development. *Human development, 62*(1-2), 14-39.

Rogoff, B. (2003). *The cultural nature of human development*. Oxford university press.

Turkle, S. (2011) Alone together: Why we expect more from technology and less from each other. Basic Books.

Turner, V. (1987). The liminal period in rites of passage. *Betwixt and between: Patterns of masculine and feminine initiation*, 3-22.

Watson, H., & Chambers, D. W. (1989). Singing the land. *Signing the land.* A portfolio of exhibits. http://singing.indigenousknowledge.org/

Wegerif, R., Mercer, N., & Dawes, L. (1999). From social interaction to individual reasoning: An empirical investigation of a possible socio-cultural model of cognitive development. Learning and instruction, 9(6), 493-516.

Woolley, A. W., Chabris, C. F., Pentland, A., Hashmi, N., & Malone, T. W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *science, 330*(6004), 686-688.

2-1
發展集體智慧的教育科技

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摘要

我們目前面臨的巨大挑戰，來自於尚未表現集體智慧的人類活動。「人類世」(Anthropocene) 這地質年代被視為人類活動對整個地球的命運和未來產生影響的時代，全球暖化只是影響之一。這個新時代與網際網路的全球盛行同時發生並非巧合。儘管網際網路具備巨大潛力，但使用方式助長了錯誤資訊和社會兩極分化，因此現在被廣泛視為一種威脅。在本次演講，我認為因應

這些挑戰的最佳方式，是通過以科技為主的教育設計來促進集體智慧。我提供了一些實施方式說明，並基於既有的研究發現，提出一套教育科技設計和實踐的原則。最後，我提出一研究發展的建議，以創建一個連貫的全球教育系統，以實現更具集體智慧的未來。

一、我們面臨的挑戰

在文化歷史時間維度上，網際網路時代的到來，以及在地質時間維度上「人類世」(Anthropocene) 的到來，都對人類產生了嚴峻的挑戰。近幾十年來，網際網路成為新的主要交流方式，將大多數人類集中在一個本質上具有「實時」（real-time）雙向（two-way）對話互動可能性的單一媒介中。這一非凡發明也帶來了許多挑戰。最初網際網路被視為提供民主潛在的支持，現在更普遍地被視為對民主的威脅，Facebook 等全球社交媒體平台被指控鼓勵極端主義和傳播「假新聞」。部分問題肇因於設計來提高廣告收入的演算法會獎勵極端觀點，表達憤怒的消息比溫和的消息獲得更多的可見度和「按讚」，同時社交媒體經常會推動「迴聲室」(echo chambers)，有相同的觀點的媒體經由相互按讚的模式聚集在一起，通過排除多樣性、挑戰質疑和發展。在教育方面，網際網路被指控會鼓勵分心和縮短注意力，因此影響兒童的認知發展 (Carr, 2010；Greenfield, 2015）。還有人擔心網際網路會導致家庭「孤單的在一起」(alone together)，每個人都黏在手機上而

不是一起交談，因此產生了無法彼此連結，或是只能膚淺地連結的年輕人 (Turkle，2011)。

這些對民主和兒童期社會化的擔憂是我們這個時代所面臨重大挑戰的面向之一，也就是從多種獨立的印刷文化過渡到單一的全球網際網路文化的管理。在文化歷史時間維度上，轉變到網際網路時代的同時，更大的地質時間維度上對人類世發端的認識也日益增長。人類世是地理學的概念，即地球已經進入了一個以人類統治地球為特徵的新地質時代。全球暖化等影響顯示，人類現在所做的事情正在影響我們的環境品質，因此，如果我們要繼續繁榮，或只想繼續生存，那麼全球範圍內的集體自我規範就變得至關重要。人類世對未來提出了挑戰，這意味著我們需要進行跨國合作，以了解和解決全球暖化等任何單一國家都無法解決的問題。這表明我們需要設計教育，以促進未來可能的全球集體智慧。我們主張一個輔以科技的更好的「對話式教育理論」（theory of dialogic education），可能有助於我們應對網際網路時代和人類世帶來的挑戰。

二、 什麼是教育？

如果我們看一下教育這個詞如何常被使用，我們會發現它指的是學校、學院和大學的教育系統，並與識字和算術密切相關。儘管網際網路時代已經到來，但基礎教育仍常被是視為等同於閱讀、寫作和算術，而更高層級的教育亦仍被視為掌握書籍中包含

的知識 (Pea & Cole, 2019)。

如果稍退一步，對教育採取更理論化的觀點，將有助於考慮教育在不同文化和不同時代是如何發生的。例如，口傳文化（oral culture）即以不同的方式來理解教育。

在口傳社會 (oral society) 中，教育往往不涉及學校，也不涉及可以傳輸和儲存在記憶中的再現 (representations) 形式的知識觀念。除了經由個人關係實施的學徒教育 (Rogoff, 2003)，大多數口傳社會都有入會儀式，吸引年輕人到涵蓋更普遍的文化聲音（有時被稱為祖先）的生活關係中 (Turner, 1987)。此種教育現在可能被歸類為現代生產力教育和文化認同教育兩者之間的重疊。大多數真正的口傳文化中的每一項活動，都涉及與適當的祖先建立生活關係。Malinowski 揭示了在美拉尼西亞，刻在捕魚獨木舟船頭上的祖先符號如何被視為生產科技的重要組成 (Malinowski, 1922/2013, p 116)。以類似的方式，澳大利亞原住民所謂的「歌曲情節」(songlines) 嵌入了許多有用的生產知識，如與土地、動物和植物的關係形式，以及與篳路藍縷、開將闢土的祖先的關係形式。對歌曲的教育並不被概念化為學習有用的再現知識，而是學習聆聽祖先的聲音，因為他們通過景觀特徵對部落成員唱歌 (Watson & Chambers, 1989)。

退一步採取理論立場，使我們能夠看到更普遍的模式，這種模式既是口傳文化教育的基礎，也是印刷文化教育的基礎。教育可以被描述為指引與導入參與一個時間性長期和空間上廣泛的文化對話，知識是其中的一個面向。知識不能與對話分開，因為它

採取對話中回答問題的形式，並且隨著對話的發展，問題會改變，答案也發生變化。教育有兩個相互關聯的主要功能：「認同形成」和「文化實踐」的連續性。文化上長期對話中的引導使生物個體、社區的新來者，能夠通過取用文化（通常意味著學習如何與祖先交談）來學習如何成為「完全」(full) 的人（即文化上的人以及生物學上的人），並在其中找到自己的位置。文化實踐的引導與認同形成密切相關，它是關於學習如何使用祖先傳下來的工具和科技，以及如何參與使用它們的對話。在認同和實踐這兩方面，每一代人都有意識和無意識地探索和學習，為故事和文化科技添加更多內容，並將添加的內容傳遞給後代。

三、發展集體智慧的教育

現存的教育系統幾乎完全著重於發展個人知識和「會考試」的能力，就算有發展集體智慧，也不會在這方面花費太多精力。這造成一個問題，因為現今幾乎是每個專業工作的普遍面向，必須與地理位置相距遙遠的其他人線上合作解決問題。「在線上一起學習如何學習 」(Learning to Learn Together Online, L2L2O) 在生活的各個領域都變得至關重要。最近 COVID 19 大流行，世界各地的科學家和政策制定者合作保護人類的經驗就是一個顯著例子。近期應對臭氧層破洞威脅方面成功的全球合作，以及合作以因應全球暖化挑戰的需求顯示，現在集體智慧教育不僅對小團隊有用，對人類作為一個整體可能至關重要，如果我們要生存與繼

續繁榮。

定義集體智慧

在心理學中，測量個別人類智慧的大量研究聚焦對「G 因素」(即普通因素) 的關注，它被描述為一系列能力測驗中共同的能力。換句話說，智慧被理解為一般思考能力，不僅擅長一項任務，而且通常擅長學習新事物，並在一系列不同的環境中解決新問題。這很有趣，因為如果我們遵循這個定義，人工智慧 (AI) 就會仍只是一個幻想。我們有聰明的工具可以有效地完成特定任務，但目前還沒有軟體能夠在一系列領域和任務中表現出良好的思考能力。另一方面，我們確實有群體普遍智慧的證據。與其將如此多的力氣集中在自動化人工智慧機器的幻想上，不如將努力集中在我們知道經由結合智慧科技與人類群體，所能達成的更真實和有效的智慧。

Anita Woolley 和麻省理工學院一個團隊調查了執行許多不同類型任務的許多群體，並聲稱提出一個群體智慧強有力的衡量標準，他們稱其為「 C 」。通過類比個人智慧，我們將群體的集體智慧 (C) 定義為群體執行各種任務的一般能力。根據實證研究，集體智慧是推論一個群體執行一項任務的能力與該群體執行廣泛其他任務能力的相關性”(Woolley et al 2010)。

這項研究最有趣的，可能是群體智慧與群體中成員的個人智商高低無關，但它卻與個人「社會敏感性」(social sensitivity) 的測量相關。換句話說，優化群體智慧將焦點轉移到所謂的「軟技

能」(soft skills) 或社交和情緒技能的價值上，這些技能使人們善於相互理解與團隊合作。

將聰明（wisdom）加入「智慧」（intelligence）

當西洋棋世界冠軍 Gary Kasparov 被「深藍」(人工智慧電腦程式) 擊敗時，他離開，生了一會兒悶氣，然後帶回巧妙的新下棋方法，即由人類棋手和非人類電腦棋手組成的團隊，他稱之為半人馬 (centaur)。正如人們所期望的，這種組合被證明比任何單一棋手都要好。更有趣的是，它也被證明比任何單一的西洋棋電腦要好。人類棋手為比賽帶來了有價值的東西 -- 非演算法的創造力。

當我們談論智慧機器時，我們通常使用相當有限的智慧 (intelligence) 定義。如果機器能夠快速有效地解決問題，我們就稱它們為智慧機器。但這些問題必定來自某處。智慧一詞的詞源顯示，其原始的含義與目標的選擇有關，而不僅僅是目標的實現。智慧最初意味著說出正確事情的脈絡智慧，但現在通常只意謂著快速準確地解決問題。即使是為了玩像西洋棋這樣相對簡單的遊戲，人類也可以派上用場，作為控制論系統的一部分，使用先見之明在不同選項之間做出明智的選擇。我們也需要電腦來處理數據並計算出不同選項的後果。這種組合是無與倫比的。集體智慧將人類和科技結合在系統中，這些系統不僅能夠快速實現目標，而且能夠產生明智的目標，並根據最大繁榮的整體目的在目標之間進行選擇。

四、案例研究與說明

多年來我一直與同事一起發展和評估集體智慧的教學法。「劍橋教育對話研究小組」(Cambridge Educational Dialogue Research Group, CEDIR) 有許多久經考驗的資源來促進有效能小組「共同思考」(https://www.edu.cam.ac.uk/research/groups/cedir/) 和 (https://thinkingtogether.educ.cam.ac.uk/) 。其中一些資源也提供中文版（可向 CEDIR 發電子郵件索取）。

我有信心將我們為小學發展的教學方法稱為「共同思考」，在此一教授集體智慧的課程中，我們使用與一般智力商數相關的非語言推理測量來評量此一教學法的影響，經過十週如何有效地一起交談的課程後，共同思考小組在評量中取得了更好的成績 (Wegerif, Mercer and Dawes, 1999)。

使用智慧工具增強集體智慧

以小組的形式一起思考是一個好的開始，但這還不夠。對於許多問題，我們還需要讓更大的群體一起思考。這就是需要聰明 (smart) 工具的地方。

某種程度上，長久以來，我們一直有科技支持集體智慧。讀寫能力和數學都是支持大規模集體思考的科技。書寫使我們可以跨空間分享想法，也可以隨著時間的推移進行協作思考。科技所支持的集體智慧一直是我們在科學技術以及藝術和哲學方面取得成功的背後原因。然而，這種集體智慧明顯的多是以隨機或自發的方式出現。問題是：「是否有可能針對集體智慧來設計？」更

相關的是，「是否有可能將教育輔以通訊科技設計，來更好地支持小群體思考和更大規模的集體思考？」我認為這是可能的，也應該這樣做。下面我將提供示例，說明如何使用智慧科技來支持集體智慧，然後再展示如何使用智慧科技來支持集體智慧教育。

Swarm-AI 和 Pol.is－將人們聚集在一起

Facebook 和 Twitter 等社交媒體平台似乎會獎勵更極端的觀點，因此被認為會導致社會兩極分化。現在一些新軟體系統有相反的功能，即凝聚社會共識。

Swarm AI 就是一個例子。群體智慧演算法調節小組個別成員的互動，他們在一組選項之間做出決定。個人之間相互連接，人工智慧代理人形成一個閉環系統，機器和個人都可以根據他人表現出的行為做出反應，以改變或保持他們的偏好。這種集體「共同思考」(thinking together) 的方法，以動物「群聚」(swarm) 的方式為藍本，已被證明可以改善許多領域的決策。
(https://www.nesta.org.uk/feature/ai-and-collective-intelligence-case-studies/swarm-ai/)

Pol.is 是另一個人工智慧支持的線上辯論和決策系統，也已經有很多成功經驗。

Pol.is 會生成一幅人們在任何對話中所處位置的地圖。因此他們可以看到他們是否分享意見或是否處於極端。這會鼓勵人們找到共同點，並通過對話達成共同的解決方案，其中包括加深他們對關鍵分歧問題的理解，並尋求最多人可以接受的創造性緊急

解決方案。

Pol.is 現在已經使用於許多情況下，數位發展部部長唐鳳也引入此一系統，以支持台灣改進民主決策歷程。(https://hbr.org/podcast/2020/10/how-taiwan-is-using-technology-to-foster-democracy-with-digital-minister-audrey-tang)

我認為 Pol.is 的運作與對話認同擴展的運作方式密切相關。當一個人在 Pol.is 辯論中發表意見時，這個人自然會關注他從過去經驗中得出的想法。然而，退後一步，查看將他的觀點與所有其他觀點相關的地圖，他自然被迫從整體對話的角度出發。從中發展出一種更具對話性的認同。我在裡面既向外說話，又能看到或聽到整個對話的視角，好像從外部向內看，將我的聲音界定和定位為其中的一個聲音。在這個過程中，個人並沒有失去在集體中的認同，而是考慮到集體的觀點，擴大了認同感。他們成為更具對話性的自我 -- 雙聲 -- 自我作為內部和外部觀點之間的持續對話。從基於自我的認同（我需要贏得爭論）或基於集體的認同（不得擾亂群體和諧）轉變為更具對話性的認同（我可以看到雙方）是成功的群體思考的一個關鍵面向。（見 https://www.rupertwegerif.name/blog/what-is-a-dialogic-self）

Edubots，引導和聚焦對話

Edubots 是擔任導師工作的人工對話代理人，已被證明在支持線上學習對話方面是有用的。人工智慧 Bots 可以用來歡迎人們，邀請他們一起組隊，講一些糟糕的機器人笑話來暖場，挑戰他們

更清晰地思考，邀請安靜的參與者多說話，普遍監督，提高互動的教育品質。Edubots 可對 MOOCs 或大規模開放線上課程中的協作學習提供重要支持（參見 Tegos, Mavridis & Demetriadis 2021 的評論）。 MOOCs 的代理人支持同儕協作 (Agent-Supported Peer Collaboration)、尖端人工智慧 (Frontiers in Artificial Intelligence, https://www.frontiersin.org/articles/10.3389/frai.2021.710856/full）。

Metafora：學習一起學習

在歐盟資助的大型計畫 Metafora，我帶領團隊發展了「協調群體學習的視覺語言」(Visual Language for Orchestrating Group Learning)。這是一個計劃和反思地圖，小組可以使用它來規劃他們的共同探究。科學教師發現它在幫助學生思考科學調查是如何運作，以及文獻探討、構建模型、測試模型等的重要性上特別有用。此系統將視覺語言的運用與更自由形式的對話區域結合，加上可以測試想法的微觀世界。例如，氣候變遷的模擬，學生們可以一起發展和測試不同的潛在解決方案。 (https://www.researchgate.net/publication/289619416_The_metafora_tool_Supporting_learning_to_learn_together)

Argunaut：支持高成效線上對話的智慧指引

在另一個歐盟計劃 Argunaut 中，我們開發系統來增強線上小組的線上帶領。將主持人儀表板的開發與線上小組對話品質的自動監控相結合，以便向主持人和小組提供反饋。主持人從儀表板

可以看到每個小組的發言品質指標、參與是否平均以及談話內容的類型。更令人興奮的是，我們能夠分析小組互動的品質，並將其作為對小組反饋的基礎。

我們在「動態概念構圖環境」（Digalo - dynamic concept mapping environment）中將對話的品質編碼如下：

1. 專注於主張、反對主張和理由的批判性思考（D1）
2. 創造性推理被理解為一種觀點的交織（D2）
3. 對話性參與，不僅包括應答性 (addressivity) 和同理心的表達，還包括懷疑的表達、想法的改變、以別人想法發言（話語中另一個聲音的存在）和引出他人的觀點（D3）。
4. 通過鼓勵和對於概括、重新表述和評估的鷹架支持來主持（D4）。

經由資料探勘技術，我們能夠對推理和創造力進行強大的自動編碼。在 Argunaut 的淺循環中，主持人可以看到品質指標，並通過一系列評論進行干預。Argunaut 深循環的想法是品質指標不斷被評估和改進，指導意見也是如此。這會需要一個龐大的使用社群，所以我們還沒有超越基本的概念證明，但這個想法令人興奮。

想像您是一位擁有 20 個或 100 個 小組，每組 5 到 8 名學生的線上教師。您有一個儀表板，可讓您進入每一小組並提供建議。自然語言處理資料探勘 (AI) 會告訴教師與每個組中互動的品質相關的可能指標，並建議進入房間後的提示詞，例如「你能以不

同的角度看這件事嗎？」或「你覺得怎麼樣，John ？」。在決定如何評論或是否以評論介入前，教師可以更詳細地查看該組的運作，也可以讓機器為教師決定。每個此類介入的影響都由 AI 監控並反饋，以持續提升系統的整體性能。
https://www.researchgate.net/publication/228479459_Facilitate_the_facilitator_Awareness_tools_to_support_the_moderator_to_facilitate_online_discussions_for_networked_learning

五、教育科技的設計原則

我們提出的作為設計基礎的教育科技理論是重視對話，且為擴大對話而設計。這理論與其說是作為設計的架構，不如說是設計的基礎。這是對教育的思維之一，它在不同的環境脈絡中為不同的設計架構提供資訊。

我們臨時性和試探性地提出了一個鬆散的教育科技設計架構，由一組相互關聯的理想狀況組成：

1. 參與設計：利用科技和教學法，讓學生有機會在從課堂對話到全球文化對話的各個層面進行對話和參與學習對話。
2. 連接設計：開放和拓寬對話空間，使不同層級的聲音、個人的聲音和普遍他人的文化聲音能夠彼此對話。
3. 擴展設計：支持從短期和本地到長期和全球的不同時間維度對話之間的永續雙向對話性互動。

大多數被稱為「教育中的人工智慧」(AI in education) 的研究

都是關於使用數據分析和資料探勘科技加速個人學習，以提供適性的個人化學習軌跡。這一任務已經達成了。我們現在需要做的是研究如何使用類似的智慧科技來支持協作學習和發展集體智慧的教學。

我在本次演講中提供的例子顯示了科技在支持更好的集體思考，以及更好的集體思考教育的巨大潛力。 以下列出了一些規模日漸擴張的計劃的一些想法，並不周延，請大家提供對這部落格進一步的想法與評論。

（一） 我們需要對用於支持教育中的集體智慧的數位科技進行徹底檢視。不僅僅是審查，還要發掘尖端開發領域和採訪計劃負責人。涵蓋水平掃描 (horizon scanning) 和水平掃描之外。

（二）我們可以使用「設計本位的教育研究」（Educational Design-Based Research, EDBR）在線下一起教授思考，並結合線上課程領域中特定概念的適度小組學習。我想以 Edubots 促進小組學習對話，可能有一些內容知識來幫助選擇示例和一些學習來持續改進對話。做法可以是具體的概念學習，也可以是溝通和對話技巧。

（三）發展 Argunaut 深循環思想，提高機器對線上小組談話教學之教育品質的認知。

（四）使用 Metafora 視覺語言等工具，結合教導思考，支持

基於挑戰的學習，應對全球暖化等挑戰。這目的是提升相關意識、教導如何以團隊合作解決問題，以及如何像科學家一樣思考。如果是參與成員來自全球不同區域，那更進一步的目標將會是全球公民教育。

（五）發展一個全球平台，支持教育以發展我們這星球的集體智慧。任何人、任何地方只要有智能手機的人都可以加入的教育平台，以線上或離線方式學習小團體的基本對話技巧，然後引導他們與其他人一起探討他們最感興趣的挑戰。每個挑戰都將得到具有內容知識的開放教育資源的支持。這將是探索另一種教育系統的可能性和潛力的一種方式，一種旨在讓學生參與設計未來的全球教育系統。

當前的主流教育方法並不利於產生解決未來挑戰所需的集體智慧。大多數學校的課程就像一個人倒退著走向未來，無法看到面前的威脅，因為他的注意力只集中在過去。學校教育所傳授的知識和技能顯然曾經對某人有用，但這並不能保證它們將繼續有用。是否有可能將這個系統轉變為面向前方，引導學生從一開始就進行關於未來的對話，並為他們提供建設性參與建構未來所需的技能和知識？這就是為集體智慧設計教育的意義所在。我們有一些如何開始的好主意，但不能確定什麼會奏效。我們現在需要的是仔細的設計實驗，嘗試由智慧工具支持的新教育方法，看看它們是如何運作。這就是我們在劍橋 deficambridge.org 上經由新的「數位教育未來計劃」(Digital Education Futures Initiative) 嘗試

做的事情。如果您可以協助，請讓我知道。

六、設計未來

教育科技整合了教育學設計和科技設計。這是關於提升更多對話自我的設計與科技支持之對話空間的設計。在每次成功的對話中，形成了一種集體認同，它不從屬於組成的聲音。相反地，當對話運作良好時，每個參與者都會感到擴展和豐富。我對這種教育科技對話性理論的期待是它不僅可以克服人與其他人之間明顯的疏離，而且可以克服人類與科技間明顯的疏離。激勵我的願景是，有朝一日，一種擴展的對話性集體意識能夠利用日益相互聯結的全球科技網絡來促進全球共榮，不僅僅是人類的繁榮，也是地球的繁榮。就好像我們一直在共同建構一個共同身體，一個巨大的身體，擁有連接大量強大且極其複雜的傳感設備和生產機器的光纖神經通路。但我們共同打造的這個新巨人缺乏靈魂。與科技的對話教育是關於我們如何共同成長，成為居住在新的共同身體中所需的共同靈魂。我以一個相當消極的故事開始這篇文章，即如果我們想要繼續繁榮甚至生存，我們需要因應網際網路時代和人類世帶來的挑戰。這是看待我們處境的一種方式，一種被動回應的方式。同樣故事的積極替代版本是，網際網路時代和人類世的融合提供了一個非凡的機會，一個創造史上前所未見事物的機會：一個全球範圍內自我調節的有機體。教育科技的對話式理論不能完全靠它自己來實現這一劃時代的轉變。我提出這個

理論作為一個可能有用的小工具，為我們未來共榮所需的教育設計奠定基礎。

參考文獻

Carr, N. (2010). *The shallows: How the internet is changing the way we think, read and remember.* Atlantic Books Ltd.

Greenfield, S. (2015). *Mind change: How digital technologies are leaving their mark on our brains.* Random House

Pea, R., & Cole, M. (2019). The living hand of the past: The role of technology in development. *Human development, 62*(1-2), 14-39.

Rogoff, B. (2003). *The cultural nature of human development*. Oxford university press.

Turkle, S. (2011) Alone together: Why we expect more from technology and less from each other. Basic Books.

Turner, V. (1987). The liminal period in rites of passage. *Betwixt and between: Patterns of masculine and feminine initiation*, 3-22.

Watson, H., & Chambers, D. W. (1989). Singing the land. *Signing the land.* A portfolio of exhibits. http://singing.indigenousknowledge.org/

Wegerif, R., Mercer, N., & Dawes, L. (1999). From social interaction to individual reasoning: An empirical investigation of a possible socio-cultural model of cognitive development. Learning and instruction, 9(6), 493-516.

Woolley, A. W., Chabris, C. F., Pentland, A., Hashmi, N., & Malone, T. W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *science, 330*(6004), 686-688.

3

Developing Civic Competence for a Precarious Future

"Yet I still dare to hope"[1]…

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Civic education throughout history has been a concern for all governments, irrespective of political system. Shaping civic beliefs, ideas and actions is a key process for developing regime support, creating legitimacy and developing trust. This is as true for democracies as it is for authoritarian regimes.

[1] Lamentations 3:21 New Living Translation of the Bible

Li (2021), for example, showed how influential regime 'types' are in shaping forms of civic education. Her research focussed on Taiwan, Hong Kong and Mainland China. It was a salutary reminder that although the focus of civic education is on schools and classrooms, these are embedded in broad social, political and economic contexts that cannot be ignored. The kind of citizens we want, the values they should hold and the actions in which they should be involved are often dictated by these broader contexts. Education systems, schools and teachers then play a crucial role in developing programmes of civic education that can achieve regime objectives. This link between regime type and civic education may be seen as mechanical. It may seem obvious that regimes dictate the kind of civic education that will provide ongoing support for regime maintenance. I want to suggest, however, that if links between regime type and civic education remain fixed and static, then civic education may not contribute to the development of an intelligent citizenry. The future will be challenging: so too must civic education if new and emerging challenges are to be met.

The question that confronts us today is how civic education should be constructed in a future context described as precarious. Within this context there is 'democratic backsliding' and "illiberal democracy" on the one hand and the promise of social media and more radical forms of civic engagement on the other. How should civic education be developed to meet these specific challenges and what form should it take in the future? To address these issues this paper will[2]:

[2] Throughout, I draw on my book, *Civic Engagement in Changing Contexts - Challenges and Possibilities for Democracy* (Springer, 2021).

- Identify issues related to precarious social and political contexts;
- Civic competency for precarious times - democracy in trouble?;
- Will social media and radical forms of civic engagement help in the future?;
- What will be the role of democratic institutions in the future? and
- What will civic education look like in the future?

Changing times, precarious contexts

Having survived the so called "millennium bug" problem at the turn of the century, the 21st century provided a sense of optimism signalling a new start. With the collapse of European communism in the 1990s there had been hope that Fukuyama's (1989) prediction about "the end of history" was being realised and that liberal democracy had triumphed. Yet the 9/11 attacks on the New York Trade Centre were not so much "the end of history" as the beginning of a new era of conflict, accusation, belligerence and dishonesty. The post-9/11 era has involved protracted wars, global financial crises, the re-emergence of authoritarianism, accelerated political protests, extraordinary global mobility and health pandemics. The extent of turbulence has stretched the limits of democratic institutions, seen the emergence of new political forces, unsettled the liberal international order and created enormous geopolitical disruptions. It is these contexts that form the backdrop to this paper, and it is such contexts that have contributed to the precariousness of the 21st century.

This use of the term "precariousness" is in line with Biglia and Marti's (2014) view that 'precarity' as both a social and academic construct has multiple meanings. Initially, and primarily, it has been a labor market

construct that described the precarious conditions of workers in the neo-liberal state. Yet an expanded view of precarity locates it at another level that can best be described as influencing the whole of life:

> This implies a lack of life security and a feeling of permanently living in a "state of flux" - an unstable environment with no options for making plans for the future, even the very near one. (p.1489).

This broader approach to precariousness (rather than 'precarity', that Butler views as an individual condition of people in poverty (Watson, 2012)), will be used in this paper. It is consistent with the way Judith Butler (2004) uses the term in her reflections on post-9/11 in the United States. She constantly referred to the vulnerably that was engendered both within in the country and in the follow up actions that created similar vulnerabilities outside the country. This vulnerability, as a lens on precariousness, is largely a collective phenomenon - it is done to us and is also something we create for others. Botha (2014) described the modern situation not in terms of precariousness but rather in terms of fragility:

> Fragility describes the condition of a world subject to flux, and in which order is only ever contingent. So pervasive is fragility to existence that it arguably constitutes an existential modality. Fragility is both promising and threatening: it indicates the possibility for change, yet this possibility also places the prevailing order at risk. (p.1)

Precariousness, vulnerability and fragility: if these are the drivers of the 21st century creating a future of uncertainty, what are the implications for

developing civic competence?

Civic competency for precarious times - democracy in trouble?

Bennett (2008) exclaimed that “democracy is not a sure thing” (p.1). Terms like “democratic backsliding” and “illiberal democracy”, popularized in recent political discourse, highlight this issue. There are several ways to understand this issue and its relation to civic education.

Monitoring the health of democracy

Table 1 shows a comparison of approaches adopted by different organizations to convey the current status of democracy.

There are critics of this measurement approach (Knutsen, 2014) and it is well to keep this in mind when complex issues are reduced to simple explanations.

Freedom House (2020), for example highlighted the fact “countries with net declines in their aggregate Freedom in the World score have outnumbered those with gains for the past 14 years” (p.2). This was meant to suggest a decline in commitment to democracy, but it is not strictly accurate. There were differences over time, but there was not “fourteen years of democratic decline” as FH (2020, p. 2.) suggested. As Kennedy, (2021) pointed out: “It would be more realistic to refer to fluctuations over time, fluctuations that are neither consistent nor indicative of a strong trend.”

Table 1

Indicators of the Status of Democracy

Freedom House (2020)	Economist Intelligence Unit Democracy Index (2021)	V-Dem (2021)	Rule of Law Index
Elections	Elections	Elections	Accountability[1]
Participation	Participation	Participation	Just laws[2]
Functioning of Government	Functioning of Government	Deliberation	Open government[3]
Free Expression	Political Culture	Egalitarianism	Accessible and impartial dispute resolution[4]
Organizational Rights	Civil Liberties	Liberalism	
Rule of Law			
Individual Rights			

[1] "The government as well as private actors are accountable under the law" (World Justice Project (WPJ), 2020, p. 10)

[2] "The laws are clear, publicized, and stable; are applied evenly; and protect fundamental rights, including the security of persons and contract, property, and human rights" (WPJ, 2020, p. 10)

[3] "The processes by which the laws are enacted, administered, and enforced are accessible, fair, and efficient" (WPJ, 2020, p.10)

[4] "Justice is delivered timely by competent, ethical, and independent representatives and neutrals who are accessible, have adequate resources, and reflect the makeup of the communities they serve" (WPJ, 2020, p.10) (From Kennedy, 2021).

On the other hand, the report did note the emergence of Hindu nationalism in India, the negative experience of the Uighurs in China, Trumpism in the United States, and populism in Europe, all of which do signal that in some jurisdiction democratic principles are under threat. These

qualitative descriptions, rather than the numbers, are more likely to highlight the problems of democracy.

The Economic Intelligence Unit (2021) took a different approach to numbers. It highlighted that only "8.4% (of the population) reside in a "full democracy"…. more than one-third of the world's population live under authoritarian rule" (p.3). This is important to remember – democracy is far from everyone's experience.

V-Dem (2020) sought to highlight the increase of "autocratization". Yet "electoral autocracy" is now "practiced …. 40% of all nations" (p.13) and "closed autocracies" "increased in the last few years, from 21 (12%) in 2013 to 25 (14%) in 2019". The result of this is that as of 2020, "51.4% (of countries)…are under authoritarian rule in one form or the other…… (and) 54% … of citizens now live in autocracies" (p. 13). As Kennedy (2021) pointed out: "this does not really provide the basis for declaring that "democracy is dead". What this suggests is that support for democracy across countries ebbs and flow,s so if 1972 is the baseline, then 2019 is certainly an improvement". This is the main lesson to learn from the multiple reviews of democracy's status. Democracy is not "dead" – but neither has it triumphed, and in places it is under severe pressure.

Literature review

A particular concept that highlights the status of democracy is "illiberal democracy". It seems at first glance to be contradictory since almost by definition democracy has been associated with liberalism, freedom and rights. Zakaria (1997), who is credited with introducing the terms into political discourse, drew a distinction between "democracy" and

"constitutional liberalism" (p. 22). The former he associated with "fair and fair elections" (p.22) while the latter is characterized by "the rule of law, a separation of powers, and the protection of basic liberties of speech, assembly, religion, and property (p.22). Zakaria (1997) concluded that "Western liberal democracy might prove to be not the final destination on the democratic road, but just one of many possible exits" (p.24).

Plattner (2019) used the example of Victor Orbán's electoral victories in Hungary from 2010 onwards reporting Orbán's own words that "we are constructing in Hungary an illiberal state…. a non-liberal state" (p.9). Yet for writers such as Mounk (2020), while acknowledging the emergence of "dictatorships" (p. 23) like those of Orbán's, argues that they are unlikely to last, "since autocracies rooted in populism are so young, we have very little information about whether they will be more adept at managing their own internal contradictions" (p.33). But this does not guarantee a transition to liberal democracy.

Illiberal democracy is seen by many as an end point for the populist politician who relies on people's support without enabling them to share political power in any meaningful way.

Poland was not so explicitly about being "illiberal". In Poland, threats to the state of any kind are seen are constructed as "internal and external enemies" (p. 218) so there is no room for opposition – just compliance often linked to concepts such as the "will of the people" rather than to politics directly.

Overall it is clear that democracy is under pressure – certainly not vanquished and certainly not dead. But it is clear that democracy cannot be

taken for granted – this is the lesson for civic education. Yet what should be the response?

Will social media and radical forms of civic engagement help in the future?

Strengthening democracy is an obvious response where there are open challenges and declining commitment. As Foa & Mounk (2017) pointed out:

> Whether democratic deconsolidation will one day be seen as the beginning of the end for liberal democracy depends in good part on the ability of democracy's defenders to heed the warning and to mount a coherent response. (p. 15)

In this section I want to consider two possible responses that are consistent with current discourse and that might also readily (and sometimes too readily!) come to mind:

Social media

Banaji & Buckingham (2013) talked about "the civic promise of the internet" (p.8). There are many ways to consider this promise, but one that is particularly important is how social media engagement constructs civic participation. If such engagement benefits democracy and expands its support base it would clearly be worthwhile as a means to support democracy.

Theocharis & van Deth (2018), for example, developed a scale called "digital network participation" (consisting of three items "posting or

sharing links, commenting, and encouraging other people to take action", p.8). Results indicated a small and negative correlation between voting and digital network participation (p. 14) suggesting that they are certainly measuring different things. These results suggest that whatever "digital network participation" is measuring, it does not seem to support institutional participation.

A related debate is related to what is called "slactivism", defined as "a "lazy" form of activism whereby individuals limit their participation to social media activity rather than onsite involvement" (Smitha, Krishna & Al-Sinana, p. 182). Others refer to "clicktivism" that " signals endorsement of an existing post. While clicktivism indicates advocacy, it does not provide a voice to the participant to express original views" (George & Leidner, 2019, p.7). These characterisations described an alternative view to those that saw the promise of social media engagement as a new form of civic engagement and action. Yet they are somewhat limited in the sense that they focused on actions alone.

Harlow & Guo (2014) offered a more nuanced view based on their interviews with activists. The certainly identified 'slacktivism' as "diluting activism and creating a new era of armchair activism" (p.472). They also argued that "new technologies (were) constrained by the digital divide." (p.475) and therefore not available to everyone. Perhaps their key question was whether social media engagement would do anything for "social change, equality and democracy" (p. 475).

The important point to note about these evaluations, as with 'slacktivism' and 'clicktivism, ' is that they were made in relation to protest

activism. Thus, for advocates of such activism social media engagement is too passive – it falls short both as a process and in its outcomes. It may be useful for some purposes (and more will be said about this in the next section) but for committed activists, it fails to convince as a new tool for supporting democracy.

Unconventional forms of civic engagement

Civic education is usually concerned with conventional forms of civic engagement – voting, volunteering, joining a political party, supporting a political candidate etc. Yet the Global Peace Index for 2020 (Institute for Economics & Peace, 2020) reported that:

- There has been a sharp rise in the level of civil unrest over the last decade, with over 96 countries experiencing at least one violent demonstration in 2011;
- From 2011 to 2019, the number of riots, general strikes and anti-government demon stations around the world increased by 244 per cent;
- Europe had the largest number of protests, riots and strikes over the period, totalling nearly 1,600 events from 2011 to 2018. Sixty-five per cent of the civil unrest events in Europe were nonviolent (p. 4).

Given the difference between what we teach and what is happening in the real world there needs to be a better understanding of different forms of civic engagement and how decisions to participate take place. In particular does such engagement advance democracy?

Lamprianou (2013) for example, refers to the 2011 riots in England

and asks whether they represented political participation or 'acts of "pure criminality"' (p. 22) as described by the then British Prime Minister, David Cameron. If, as argued by the European Union, active citizenship is about social cohesion, it is clear that illegality, particularly involving violence, is of another order when it comes to what might be considered legitimate participation. Lamprianou (2013), for example, argued that illegality is 'clearly beyond the acceptable boundaries of the political establishment and its institutional norms' (p. 23). At the same time, Pasternak (2019) argued that recent violent protests in the Hong Kong were morally defensible. Yet were they effective? Civic engagement for democratic purposes needs to be effective in bringing about its purposes, or why participate? Given the age of many protestors, this is an important issue for the future of civic education. The question is: Which forms of civic engagement can best support democracy and how can the best decisions be facilitated?

What will be the role of democratic institutions in the future?

Kahne & Westheimer (2003) criticized approaches to citizenship education that focussed on personal responsibility and character education because they neglected "government, politics and collective endeavours" (p.39). The recommended remedy was to focus on "skills for civic engagement - how to work in a group, speak in public, forge coalitions among varied interests, and protest or petition for change" (p. 39). It is difficult to disagree with the importance of these social skills or encouraging the development of "collective endeavours". Yet it is not clear whether these skills would meet the original criticism about the absence of "government" and "politics" from civic education. Is this kind of raw engagement in civil

society the best preparation for influencing governments and politicians? In responding to this question, the important point to understand is that such raw civic engagement depends on democratic institutions: such institutions define it, sanction it and regulate it.

Kahne, Hodgin & Eidman-Aadahl (2016), for example, distinguished between 'participatory politics' and 'institutional politics', especially in the context of of using social media. Their survey indicated that young people preferred more participatory forms of engagement especially since this was so readily available on various forms of social media. At the same time, it seems young people often felt excluded from institutional forms of civic engagement such as voting, participating in elections etc. because they "have few meaningful chances to give input" (p. 8). As Kahne et al., (2014) highlighted:

> Scholars have argued that new media may be facilitating a broad shift in the form and focus of politics. The shift entails a movement away from civic and political engagement that turns around issues and activities defined and structured by elites and state institutions and toward a range of more direct forms of lifestyle and expressive politics (p.7).

In moving away from institutional forms of democracy to embrace forms of engagement that offer instant gratification and feelings of involvement, young people may miss out on understanding how democratic forms of government empower them, provide them with support and encourage their ongoing involvement in the political life of the country. This is not to dismiss the importance of more direct forms of participation: it is,

however, to argue that understanding democracy is at least as important as participating in it.

Civic understanding of democratic institutions should be a necessary precondition for a more activist civic engagement. Engaging in these institutions, understanding their purposes and supporting their role in a democratic society needs to be an important aim of civic education.This includes understanding the purposes of different forms of civic engagement and how they can contribute to civic education as well as understanding pedagogy that aids rather than hinders learning. Civic education needs to embrace all of this if fully fledged citizens are to be prepared as influencers in the civic domain.

When Rudi Dutschke, a twentieth-century left wing radical, formulated plans for transforming capitalist societies, he talked about 'the long march through the institutions' (Balhorn, 2018). The idea behind this particular 'long march' could mean different things ranging from 'reintegrate(ion) into parliamentary democracy in order to change the system from within' to 'shak(ing) things up and disturb(ing) the established order in whatever social institutions they found themselves in' (Balhorn, 2018). Either way, the focus is on institutions and their importance to democracy. O'Donnell (2012) referred to this as 'institutional democracy' that 'offers a significant route to democratic enhancement and reform'. Institutional democracy is not a polar opposite of participatory democracy: it is another aspect of participation that emphasises the importance of engaging in society's democratic institutions.

O'Donnell (2017), with particular reference to British politics, defined institutional democracy as:

> The extent of institutional democracy as described above should not be underestimated. It extends to every institution or organisation in any political system, 'cultural, political and social' (O'Donnell, 2017, pp. 86–87).

The agenda, therefore, is designed at a societal level and looks to the transformation of society. This goes much further than can be, or probably should be, encompassed by schools.

An argument can be made, however, that schools can contribute in a meaningful and specific way to a part of the agenda for developing institutional democracy. It can do this by pursuing two objectives: facilitating an understanding of a society's political institutions and ensuring that students have direct experience of democracy as part of their school life.

O'Donnell (2017) argued that the idea of institutional democracy had important implications for schools:

> civic competence requires an understanding of the 'grammar' of the relevant institutions – it has to be explained and learnt. The necessary training to participate in any institutional context might best take place within the given setting, but education about the functioning and distribution of power and rewards in organisations should begin at school along with political education. (p. 89)

This focus on the political responds to the critique of the 'socially responsible citizen' referred to above. Young citizens need to be engaged in the political, and they citizens need to learn what this means and how institutional engagement works in different societies. At the same time,

they can experience democratic engagement in their schools and as part of their daily lives. Understanding democracy and experiencing it need to recognized as the key foci of civic education for today's young people. It is no mean feat to produce responsible citizens who can support democracy's values and purposes.

What will civic education look like in the future?

The formal school curriculum needs to have a place for civic education. It may take the form of a single subject, a theme integrated with another school subject such as history or geography, a cross curriculum theme that is designed to infuse all school subjects or it can consist of extra curriculum activities. Fairbrother and Kennedy (2011) showed that the actual form of the curriculum was not a major factor influencing student learning. Yet they did show that when civic education is compulsory (in any form) there were learning gains for students. Providing access to civic learning opportunities in schools is therefore a priority.

This formal curriculum needs to introduce students to the institutions of democracy that characterise their societies. This can be done in different ways depending on the age of the students, the availability of resources and the knowledge and skills of teachers. Students can be introduced to these institutions in multiple ways. They can read about them, visit them, listen to talks form people who work in them, take part in debates and discussions about community issues, role play the way parliaments and political leaders work. They can study the history of these institutions, the controversial issues that may have been associated with them, the leaders who have influenced them, the roles they have played in creating a democratic

society. Most importantly students need to learn how to participate in these institutions, how to influence them, how to use them to bring about changes that will benefit society. Institutions may not be the only things about which students learn as part of civic education: but at the very least they need to learn that without these institutions, there is no democracy. The expected learning outcome is simple, but powerful: institutions guarantee and protect freedoms, including the freedom to participate in civil society. Without supporting institutions there is no democracy. If students understand this it will provide a solid foundation for an engaged life.

In addition to the formal curriculum, there are also generic learning skills and values that are directly relevant to learning outcomes for civic education. These might be called 21st century skills (Trilling and Fadel, 2009) or more recently skills that are needed in light of the 4th Industrial Revolution (4IR) (Kennedy, Pavlova & Lee, in press). The following skills were identified as key to the future of work for 2025: "analytical thinking and innovation, active learning and learning strategies, complex problem-solving, critical thinking and analysis, creativity, originality and initiative, leadership and social influence, technology use, monitoring and control, technology design and programming , resilience, stress tolerance and flexibility, reasoning, problem-solving and ideation" (World Economic Forum, 2020, p.36).

Labelled employment related skills, the top four, analytical thinking and innovation, active learning and learning strategies, complex problem-solving, critical thinking and analysis, are also the skills that are required by democratic citizens. These generic skills can help future citizens make

more informed, more intelligent and more strategic decisions about social and political issues. In Singapore, for example, skills like these (although somewhat different in nature) are incorporated into subject syllabuses and are designed to feature prominently in national examinations. At the same time emphasis on school-based examinations and testing in Singapore has been scaled back so more time can be devoted to the development of generic competencies (Chia, 2018).

Kennedy et als., (in press) have also highlighted the importance of 21st century values: for example, equity, equality, tolerance, social justice, respect and the valuing of diversity. As with 4IR skills, these values are very much civic values in the sense that they represent expectations of both current and future citizens. They must be at the heart of civic education.

Classrooms are also important places for effective civic learning to take place. Many studies have shown that establishing and open classroom climate (OCC) for the discussion of civic issues is an important way to facilitate civic learning. This involves encouraging students to ask questions of each other and of the teacher and to facilitate an environment in which issues may be raised and discussed as part of the normal discourse of the classroom. Kuang, Kennedy & Mok (2018, p.35) identified how best to facilitate such an environment: good student-teacher relationships, the involvement of parents in discussing issues with their children, providing, a knowledge-rich environment so that students can better understand issues, developing citizenship self-efficacy so that students gain experience and understanding of civic engagement and engaging students in general in classroom activities, but especially boys who are more likely to 'tune out'.

This requires teachers to be “leaders of learning”, a term often reserved for principals (Bendikson, Robinson & Hattie, 2012, p. 3). But the idea is clearly applicable to teachers. Managing classrooms in the way described requires teacher leadership, advanced level skills, confidence and commitment. The purpose is to enhance civic learning by creating a conductive learning environment for students.

Classrooms are important for promoting civic learning, but so too are extra curriculum activities. Kennedy et al., (2014) showed that student involvement in school-based civic activities (e.g. running for election in a class parliament or participating in some form of school decision making etc.) had a direct and positive effect on students’ civic knowledge and understanding. What is more, in schools where there were high levels of school based civic participation, those schools enhanced students’ civic learning. That is to say, experiential learning is not just an end in itself: it can help to improve more formal learning. Thus, leaders at both school and classroom levels can provide opportunities for student engagement in activities both inside and outside classrooms.

Within classrooms, teachers might encourage students to take part in a class parliament that could be part of a civic lesson or series of lessons. There could be candidates, elections and voting. This would help students understand the formal processes of political engagement as well as give them the experience of participating in those processes. Another activity would be to let the class have input to the development of a set of classroom rules – engage students in discussion and debate about which rules should apply, why and what are the consequences for not obeying rules. Creative teachers

can think of many more such activities that can help students appreciate the importance of working together, respectful debate and discussion and how to reach consensus when there are different points of view. Classrooms can be important forums for learning how to engage and relate to others and teacher-leaders can be instrumental in helping this to happen.

Schools are embedded in communities and should be an integral part of them. As Li & Kennedy (2016) showed, where principals perceive that there are community resources that can assist schools, civic learning can be enhanced. This suggests that schools need to take advantage of these community resources and either bring them into schools or take students into the community. Local speakers can be invited into schools whether they are politicians, NGO leaders, business leaders, community service leaders etc. and they can contribute to lessons or special events at the school. Service learning provides a great opportunity to let students experience what is going on in the community through attachments to local businesses, health facilities, NGOs, government offices etc. Students can also be acquainted with local social and political issues and develop their own plans and approaches to help solve these issues. This is particularly important for environmental issues about which young people feel so strongly and which for the most part they see as a social rather than a political issue.

Yet moving into the community as a way to enhance civic learning needs to be built on good school-community relationships so that schools are trusted and benefits flow both ways. Achieving these aims will only happen if school leaders look beyond their schools and take deliberate steps to integrate schools into the community. The principal is probably in the

best position to do this but there is no reason all staff cannot be involved in helping to integrate the school more purposefully into community life. Joint use of sporting facilities, continuing education classes, open days, supporting community initiatives can all help to bring schools and their communities together. The rationale for doing these things, once again, is their potential for enhancing students' civic learning.

Conclusion

The future will be challenging, and it will be complex (whether it is any more challenging or complex than previously is an interesting question not explored here). Future citizens will need a strong foundation of knowledge, skills and values to support their civic lives. They need to understand the importance of democratic institutions, how to contribute to them and how to value them. This not optional – it is essential. Shaping the civic sphere – supporting it, influencing it, engaging with it – is the only way citizens have of making a difference and effecting change. Strong, accountable democratic institutions will enable future citizens to do this. There are other forms of civic engagement and at times it might be necessary to use them. Yet in general these are always underpinned and supported by democratic institutions. Thus it is not either institutional democracy or participatory democracy – it is both. Civic education needs to recognize this relationship and prepare young people to be both knowledgeable about these institutions and also willing to participate in them. This requires innovative pedagogy and the development of democratic school communities. Democracy may not be "a sure thing" (Bennett, 2008); but schools need to do their best to ensure that it at least has a chance by preparing knowledgeable students who

know about democracy and wish to participate in it. This is an important contribution schools can make to democracy's future.

References

Balhorn, L. (2018, May 23). Joschka Fischer's long march. *Jacobin*. Retrieved from http://auth.jacobinmag.com/2018/05/joschka-fischers-long-march

Banaji, S. & Buckingham, D. (2013). *The civic web - Young people, the internet, and civic participation*. MIT Press.

Bendikson, L., Robinson, V. & Hattie, J. (2012). Principal instructional leadership and secondary school performance. *Set, 1*. Accessed on 23 June 20121 from https://www.nzcer.org.nz/system/files/journals/set/downloads/set2012_1_002_0.pdf

Bennett, L. Changing citizenship in the digital age. In L. Bennett (Ed). *Civic Life Online: Learning How Digital Media Can Engage Youth* (1-24). The MIT Press.

Biglia, B. & Martí, J. (2014). Precarity. In T. Teo (Ed.) *Encyclopedia of Critical Psychology* (1488–1491). Springer.

Botha, M. (2014). Precarious present, fragile futures: Literature and uncertainty in the early twenty-first century. *Academy Review*, 31(2), 1-19.

Butler, J. (2004). *Precarious life: The powers of mourning and violence. Verso*

The Economist Intelligence Unit (2021). Democracy index 2020. Retrieved on 7 April 2021 from https://www.eiu.com/n/campaigns/democracy-index-2020/

Chia, L. (2018). Fewer exams, assessments in schools to reduce emphasis on academic results: MOE. Retrieved on 31 October 2018 from https://www.channelnewsasia.com/news/singapore/exams-assessments-scrap-mid-year-primary-secondary-schools-10767370

Fairbrother, G & and Kennedy, K. (2011). Civic education curriculum reform in Hong Kong: What should be the direction under Chinese sovereignty? *Cambridge Journal of Education*, 41(4), 425-443.

Foa, R. & Y. Mounk. Y. (2017). The signs of deconsolidation. *Journal of Democracy*, 28(1), 5-16.

Freedom House. (2020). *Freedom in the world 2020*. Retrieved on 21 August 2022 from https://freedomhouse.org/sites/default/files/2020-

Fukuyama, F. (1989). The end of history? *National Interest,* Summer, pp 3-18. Retrieved on 7 April 2021 from https://www.jstor.org/stable/24027184

George, J. & Leidner, D. (2019). From clicktivism to hacktivism: Understanding digital activism. *Information & Organization*, 29(3), DOI: 10.1016/j.infoandorg.2019.04.001

Harlow, S. & Guo, L. (2014). Will the revolution be Tweeted or Facebooked? Using digital communication tools in immigrant activism. *Journal of Computer-Mediated Communication*, 19, 463–478.

Institute for Economics & Peace. (2020). Global peace index 2020: Measuring peace in a complex world. https://www.visionofhumanity.org/wpcontent/uploads/2020/10/GPI_2020_web.pdf

Kahne, J., Middaugh, J. & Allen, D. (2014). Youth new media and the rise of participatory politics. Working Paper No , Youth and Politics Research Networ. Retrieved from file:///C:/Users/85291/Downloads/Youth_New_Media_and_the_Rise_of_Particip.pdf

Kahne, J., Hodgin, E., & Eidman-Aadahl, E. (2016). Redesigning civic education for the digital age: Participatory politics and the pursuit of democratic engagement. *Theory & Research in Social Education, 44*(1), 1–35.

Kahne, J, & Westheimer, J. (2003). Teaching democracy: What schools need to do. *Phi Delta Kappan, 85*(1), 34-40, 56-61, 63-66

Kennedy, K., Pavlova, M. & Lee, JCK. (in press). *Soft skills and hard values – Meeting education's challenges in the 21st century*. Routledge [Available from: https://www.routledge.com/Soft-Skills-and-Hard-Values-Meeting-Educations-21st-Century-Challenges/Kennedy-Pavlova-Lee/p/book/9781032113364]

Kuang, X., Kennedy, K. & Mok, MMC. (2018). Creating democratic classrooms in Asian contexts: The influences of individual and school level factors on open classroom climate. *Journal of Social Science Education, 17*(1). https://doi.org/10.4119/UNIBI/jsse-v17-i1-1678

Li, LJ. & Kennedy, K. (2016). Leadership for civic learning in Hong Kong: The role of school and community. *Asian Leadership Roundtable*, Singapore. Retrieved from https://www.eduhk.hk/apclc/roundtable2016/paper/Paper_Dr%20Li%20and%20Prof%20Kennedy.pdf

Lamprianou, L. (2013). Contemporary political participation research: A

critical assessment. In K. Demetriou (Ed.). *Democracy in transition* (pp. 21–42). Springer-Verlag.

Li, H. (2021). *The relationship between regime "type" and civic education – The cases of three Chinese societies*. Springer.

O'Donnell, M. (2012, 30 April). Institutional democracy will strengthen our society engaging citizenry and distributing power equitably. *British Politics and Policy Blog*, London School of Economics. https://blogs.lse.ac.uk/politicsandpolicy/institutional-democracy-odonnell/

O'Donnell, M. (2017). The democratic deficit: Institutional democracy. In in B. Jones & M. O'Donnell (Eds.) *Alternatives to Neoliberalism: Towards Equality and Democracy* (79-96). Bristol University Press.

Pasternak, A. (2019). Uncivil *disobedience in Hong Kong*. Stockholm Centre for the Ethics of Peace and War. http://stockholmcentre.org/uncivil-disobedience-in-hong-kong/

Smith, B., Krishna, A. & Al-Sinan, R. (2019). Beyond slacktivism: Examining the entanglement between social media engagement, empowerment, and participation in activism. *International Journal of Strategic Communication, 13*(3), 186-192.

Theocharis, Y., & van Deth, J. (2018). The continuous expansion of citizen participation: A new taxonomy. *European Political Science Review, 10*(1), 1–24.

Trilling, B., & Fadel, C. (2009). *21st century skills: earning or life in our times*. Jossey Bass.

V-Dem Institute. (2020). *Autocratization surges – Resistance grows - Democracy Report 2020*. Gothenburg: V-Dem Institute. Retrieved

on 13 April 2021 from ttps://www.v-dem.net/media/filer_public/de/39/de39af54-0bc5-4421-89ae-fb20dcc53dba/democracy_report.pdf

Watson, J. (2012). Butler's biopolitics: Precarious community. *Theory & Event, 15*(2). Retrieved from muse.jhu.edu/article/478357.

World Economic Forum. (2020). The future of jobs report. World Economic forum. Retrieved from https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

World Justice Project. (2021). Research and data. Retrieved on 8 April 2021 from https://worldjusticeproject.org/our-work/wjp-rule-law-index

3-1
發展面對不穩定未來的公民素養

“然而，我仍然敢於希望”...[1]

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縱觀歷史，無論其政治制度如何，公民教育一直是所有政府關注的問題。塑造公民信仰、思想和行動是發展政權支持、建立正當性和發展信任的關鍵過程。民主和威權政體都是如此。

例如，Li（2021）指出政權「類型」在塑造公民教育形式的影響力。她的研究主要集中在臺灣、香港和中國大陸，提醒我們：雖然公民教育的重點是學校和課堂，但這些都植根於不容忽視的廣泛社會、政治和經濟脈絡。我們想要什麼樣的公民，他們應該

[1] 哀歌 3：21 新生活翻譯聖經

持有的價值觀，以及他們應該參與的行動，往往是由這些更廣泛的脈絡決定的；教育系統和教師在能夠實現政權目標的公民教育方案中，因而發揮至關重要的作用。政權類型與公民教育之間似乎可見機械式的連結，似乎很明顯的是制度決定了什麼樣的公民教育，以便為政權維繫提供持續的支持。 然而，我想說的是，如果政權類型和公民教育之間的連結保持固定和靜態，那麼公民教育可能無助於智慧公民的發展。未來將是充滿挑戰的：如果新的和正在出現的挑戰需要解決，那麼公民教育也是如此。

我們今天面臨的問題是，在被視為不穩定的未來環境中，公民教育應該如何構建。 在這種背景下，一方面存在「民主倒退」和「不自由的民主」，另一方面是社群媒體和更激進公民參與形式所帶來的可能性。如何發展公民教育以應對這些具體挑戰？公民教育未來應採取何種形式？ 為了聚焦這些問題，本文將[2]：

- 指出關乎不穩定的社會和政治脈絡的問題 ;
- 因應不穩定時代的公民素養 - 陷入困境的民主？
- 社群媒體和激進形式的公民參與在未來會有幫助嗎？
- 民主體制今後的角色將會是什麼 ？
- 未來公民教育會是什麼樣子？

時代變遷與不穩定的環境

在世紀之交從「千禧蟲」問題中倖存下來，21 世紀提供一種

[2] 本文內容係取材自我的書：變遷脈絡下的公民參與—民主的挑戰和可能性（Springer，2021）。

樂觀的感覺，標誌著一個新的開始。隨著 1990 年代歐洲共產主義的崩潰，人們曾希望 Fukuyama（1989）「歷史終結」的預言能夠實現，且自由民主獲得勝利。然而， 對紐約貿易中心的 9/11 攻擊，與其說是「歷史的終結」，不如說是衝突、控訴、好戰和不誠實的新時代的開始。後 9/11 年代，經歷了曠日持久的戰爭、全球金融危機、威權主義的重新出現、加速的政治抗議、前所未有的全球流動性和疫情大流行。動蕩的程度超出了民主制度的極限，出現了新的政治力量，擾亂了自由主義國際秩序，並造成了巨大的地緣政治破壞。這些脈絡形塑了本文的背景 ，也正是這些脈絡導致 21 世紀的不穩定。

此處對「不穩定性」一詞的使用，與 Biglia 和 Marti（2014）的觀點一致，亦即“不穩定性”作為一種社會和學術的構念，具有多種涵意。最初，它主要是一種勞動力市場的構念，描述新自由主義國家的勞工所處的不穩定狀況。然而，一項不穩定性的延伸觀點是將其定位在另一個層面上，視其對整個生活都有影響：

> 這意味著缺乏生命安全感和永久生活在「變動狀態」– 一種不穩定的環境，無法為未來預做規劃，即使是非常近的未來。（第 1489 頁）。

本文採用的是較廣泛意義的「不穩定性」（而非 Butler 所指的貧窮者的個人「不穩定」條件（Watson，2012）），這與 Judith Butler（2004）反思 9/11 之後的美國時，所使用的語彙一致，她不斷提到在國家內部和外部產生的脆弱性（vulnerability）。這

種脆弱性可視為檢視不穩定性的透鏡，它是一種集體現象，既發生在我們身上，我們也加諸於他人。至於 Botha（2014）描述現代的情境時，不是使用脆弱性，而是使用「易碎性」（fragility）：

> 易碎性描述不斷變化中的世界處境，在這種世界中，秩序永遠是偶然的。生存的易碎性是如此普遍，以至於成為一種存在的心態。易碎性既隱含希望又帶有威脅：它指出變革的可能性，但這種可能性也使現行秩序處於危險之中。（第 1 頁）

如果不穩定性（Precariousness）、脆弱性（ vulnerability）和易碎性（fragility）是 21 世紀產生「不穩定未來」的驅力，那麼對發展公民素養有什麼影響？

不穩定時代的公民素養 – 陷入困境的民主？

Bennett（2008）曾說「民主並非必然」（p.1）。 近年來在政治論述中流行的「民主倒退」和「不自由的民主」等詞彙，凸顯了這個議題，也可以透過幾種方式理解這個議題及其與公民教育的關係。

監測民主的健康情況

表 1 比較了不同組織表達民主現況的不同取徑。

論者對於這種測量方法頗多批評（Knutsen，2014），當我們將複雜問題化約為簡單的解釋時，最好也記住這些批評。舉例

而言，「自由之家」（2020 年）提出了這樣一個事實，即「過去 14 年，平均自由度下降的國家數，遠比增加的國家多」，而且將之視為對民主的承諾降低；但這項解讀未必準確（p.2）。差異會隨著時間推移而產生，但並非如「自由之家」（2020 年，第 2 頁）所言之「十四年的民主衰落」。正如 Kennedy（2021）指出：“更務實的做法是參照時間推移的波動，此種波動既不是一致的，也無法顯示強有力的趨勢。

表 1

民主指標

自由之家 (2020)	經濟學人智庫民主指標 (2021)	V-Dem (2021)	法治指標
選舉參與	選舉參與	選舉參與	問責制 [1]
政府職能	政府職能	審議	公正的法律 [2]
自由表達	政治文化	平等主義	開放政府[3]
組織權利	公民自由	自由主義	可近用且公正的爭議解決[4]
法治			
個人權利			

[1]「政府和私人行為者都要依法負責」（世界正義專案（WPJ），2020 年，第 10 頁）

[2]「法律是明確的、公開的和穩定的，是公平適用的，且保護基本權利，包括人身、契約、財產和人權的保障“（WPJ，2020 年，第 10 頁）

[3]“法律的頒布、實施和執行過程是可及的、公平的和有效的”（WPJ，2020 年，第 10 頁）

[4]“正義的適時實現，有賴稱職、有倫理和獨立的代表和中立者，他們是可接近的，擁有適當的資源，並反映他們所屬社群的結構”（WPJ，2020 年，第 10 頁）（摘自甘迺迪，2021 年）。

另一方面，該報告確實注意到印度興起印度教民族主義、中國境內維吾爾人的負面經歷、美國的川普主義以及歐洲的民粹主義，所有這些都顯示：在某些國家管轄權內，民主原則正受到威脅。這些質性的描述（而不是量化指標），更有可能凸顯民主的問題。

經濟學人智庫（2021 年） 對數字採取了不同的方法。 它強調， 只有 「8.4%（人口）居住在『完全民主』中，有超過三分之一的世界人口生活在威權統治之下」（第 3 頁），重要的是要記住 這一點——民主遠非每個人的經驗。

V-Dem（2020）試圖強調「獨裁化」的增加：「選舉獨裁」現在被「40% 的國家實行 .....」（第 13 頁），「封閉的獨裁國家…… 在過去幾年有所增加，從 2013 年的 21 個國家（12%）增加到 2019 年的 25 個（14%）」。但這樣的結果僅能說是截至 2020 年，「51.4%（國家）..... 以不同的形式處於威權統治之下 .....（以及）54% ... 的公民生活在獨裁國家」（第 13 頁），正如 Kennedy（2021）指出：這並沒有真正為宣稱「民主已死」提供依據。 這些結果只能呈現各國對民主的支持起起伏伏；如果 1972 年是基期，那麼 2019 年肯定是一個進步的年度。 這是多重檢視民主現況得到的主要啟示：民主並非「死亡」，但它也沒有勝利；在某些地方，它正承受著巨大的壓力。

文獻回顧

一個凸顯民主現況的特殊概念是「不自由的民主」。 乍看之

下，這似乎是矛盾的，因為定義上，民主向來與自由主義、自由和權利緊密連結。Zakaria（1997）最先將這些詞彙引入政治論述，並區分「民主」和「憲政自由主義」（第 22 頁）； 前者結合「公平和公正的選舉（第 22 頁），而後者的特點是「法律主治，權力分立，以及言論、集會、宗教和財產等基本自由的保障」（第 22 頁）。 Zakaria（1997）的結論是，「西方的自由民主或許證明了它並非民主道路的終點，而只是許多可能的出口之一」（第 24 頁）。

Plattner（2019）以 Victor Orbán 從 2010 年開始在匈牙利贏得選舉勝利為例，引述 Orbán 自己的話：「我們正在匈牙利建設一個不自由的國家 ..... 一個不是自由的國家」（第 9 頁）。 然而，對於像 Mounk（2020）這樣的作家來說，雖然承認出現 Orbán 那樣的「獨裁政權」（第 23 頁），但認為它們難以持續，「因為植根於民粹主義的獨裁統治還很年輕，我們難以得知他們是否更能處理內部的矛盾」（第 33 頁）， 但這也不能保證能過渡到自由民主。

許多人將不自由的民主視為民粹主義政客的終點，因為這些政客依賴人民的支持，卻無法以任何有意義的方式讓人民分享政治權力。波蘭則並未明白顯現自己是「不自由的」。在波蘭，對國家的任何威脅都被視為「內部和外部敵人」（第 218 頁），因此沒有反對勢力存在的空間：順服經常與「人民的意志」等概念連結，而不是直接與政治有關。

整體而言，很明顯的是民主正承受壓力；當然沒有被打敗，

也當然沒有死亡。 而同樣明顯的是：民主不能視為理所當然。這是對公民教育的啟示； 然而，應該如何回應呢？

社群媒體和激進形式的公民參與在未來會有幫助嗎？

面對公開的挑戰和承諾的衰退，強化民主是一種明顯的對策。正如 Foa & Mounk （2017）所指出的：

> 民主的解體有朝一日是否會成為自由民主終結的開始，取決於民主捍衛者覺察警告並做出一致回應的能力。（第 15 頁）

在本節中，我想探討兩種可能的反應，它們與當前的論述一致，而且容易聯想到：

社群媒體

Banaji 和 Buckingham（2013）談到了「網路的公民承諾」（第 8 頁）。有很多方法可以思考這一承諾，但其中一個特別重要的是社群媒體參與如何建構公民參與。 如果這種參與有利於民主並擴大其支持基礎，那麼它就值得作為支撐民主的手段。

例如，Theocharis & van Deth（2018）開發了一種稱為「數位網路參與」的量表（由三個項目組成：發佈或共用連結，評論和鼓勵其他人採取行動」，第 8 頁）。結果指出，投票和數位網路參與之間存在很小的負相關（第 14 頁），這意味著所測量的其實是不同的事情。 這些結果顯示無論「數位網路參與」要測量什麼，它似乎並不支持制度性的參與。

一個相關的論辯與「懶人行動主義」（slactivism）有關，它是一種「懶散形式的行動主義，人們將參與限制在社群媒體活動而不是現場參與」（Smitha，Krishna & Al-Sinana，第 182 頁）；也有人提到「點擊行動主義」（clicktivism），即「表達對現有貼文的認可。雖然點擊行動顯示支持，但它並沒有讓參與者可以為表達原創觀點而發聲」（George& Leidner，2019，第 7 頁）。這些特徵化的觀點，將社群媒體參與的興起，視為公民參與和行動的新形式。 然而，這類觀點在某種程度上是僅侷限於關注行動。

Harlow & Guo（2014）根據他們對行動人士的訪問，提出了更微妙的觀點：「懶人行動主義」被確認為「稀釋行動主義」，且正在創造一個「扶手椅行動主義」的新時代」（第 472 頁）。他們也主張，「新科技受到數位落差的限制」（第 475 頁），並非人人都能使用。他們的關鍵問題也許是：社群媒體的參與是否有助於「社會變革、平等和民主」（第 475 頁）。

這些關於「懶人行動主義」和「點擊行動主義」的評估，需要注意的是：它們是與抗議行動主義有關的。 因此，對抗議行動主義的倡議者來說，社群媒體的參與太被動了，無論是過程還是結果，它都是不夠的。它可能對某些目的有用（下一節將對此有更多論述），但對於堅定的行動主義者來說，它不具有成為民主支持新工具的說服力。

非慣常的公民參與形式

公民教育通常涉及傳統形式的公民參與： 投票，志願服務，加入政黨，支援政治候選人等。然而，2020 年 全球和平指數 (Institute for Economics & Peace, 2020) 顯示：

- 在過去十年中，內亂程度急劇上升， 2011 年至少有超過 96 個國家發生過一次暴力示威。
- 從 2011 年到 2019 年，騷亂、全國總罷工和反政府示威的數量，在世界各地增加了 244%。
- 在此期間，歐洲的抗議、騷亂和罷工數量最多，從 2011 年到 2018 年，總數量接近 1，600 場；但 56% 的公民騷動事件在歐洲是非暴力的（第 4 頁）。

鑒於我們教給學生的，和真實世界中發生的事情，兩者之間具有差異，我們需要清楚瞭解不同形式的公民參與以及如何做出參與的決定；特別是這種參與是否促進了民主？例如，Lamprianou（2013）針對 2011 年發生在英格蘭的騷亂而提問：它們是否代表「政治參與」，或是如當時英國首相 David Cameron 所稱的「純粹的犯罪行為」（第 22 頁）？若依照歐盟的主張，積極的公民權是關於社會凝聚，那很顯然地，相較於正當的參與，這些非法的（特別是涉及暴力的）騷動是另一種狀況。Lamprianou（2013）亦認為，「非法性」 顯然超出了政治當權派及其制度規範的可接受界限（第 23 頁）。與此同時，Pasternak（2019）主張，最近香港的暴力抗議活動，在道德上是站得住腳的。 然而，它們是否有效？ 基於民主目的的公民參與，應該能

有效實現目的，否則為什麼要參與？ 鑒於許多抗議者的年齡，這是公民教育未來的一個重要議題。 問題在於：哪種形式的公民參與最能支持民主以及如何能促成最佳的決策？

民主體制今後將扮演什麼角色？

Kahne 和 Westheimer（2003）批評公民教育的取徑，這些取徑側重個人責任和品格教育而忽視「政府，政治和集體努力」（第 39 頁）。 建議的補救辦法是把重點放在「公民參與的技能：如何在團體中合作、公開發言，整合不同利益，以及為改變而抗議或請願」（第 39 頁）。我們很難不同意這些社會技能的重要性，也很難不去鼓勵發展「集體努力」。 然而，目前尚不清楚這些技能是否符合最初關於公民教育缺乏「政府」和「政治」的批評。這種基本的公民社會參與是影響政府和政客的最佳準備嗎？ 在回答這個問題時，需要理解的重要一點是，這種基本的公民參與取決於民主制度：這些制度定義它，制裁它並規範它。

Kahne，Hodgin 和 Eidman-Aadahl（2016）針對使用社群媒體的脈絡下，區分「參與性政治」和「制度政治」。 他們的調查指出，年輕人喜歡參與性較強的參與形式，主要是因為在各種社群媒體上都很容易參與。與此同時，年輕人似乎常常感到被排除在投票、參加選舉等制度性的公民參與，因為他們「少有投入的機會」（第 8 頁）。正如 Kahne 等人（2014）所強調的：

> 學者們認為，新媒體可能正在促成政治形式和焦點的廣泛轉變。這種轉變意味著公民和政治參與從精英和國家機構

> 定義和建構的議題與活動，轉向更直接的生活方式和表達性政治（第 7 頁）。

在擺脫制度形式的民主，擁抱提供即時滿足和參與感的參與形式時，年輕人可能會錯過瞭解民主的政府形式如何賦予他們權力，為他們提供支援，並鼓勵他們持續參與國家的政治生活。這並不是要否定更直接的參與形式之重要性，而是主張：理解民主跟參與民主一樣重要。

對民主制度的理解應該是更積極的公民參與的必要先決條件。 參與這些制度、瞭解其目的並支持其在民主社會的角色，應該成為公民教育的重要目標；這包括瞭解不同形式公民參與的目的，以及它們如何有益於公民教育，再加上掌握有助於而不是阻礙學習的教育方法。 如果要培養成熟的公民以便在公民領域發揮影響力，公民教育應該要涵蓋上述所有的目標和方法。

當二十世紀的左翼激進分子 Rudi Dutschke 擬定資本主義社會轉型計畫時，他談到「透過制度的長征」(Balhorn, 2018)。這種特殊的「長征」背後的想法可以意味著不同的事情，從「融入議會民主」進行內部改造，到「撼動」他們所處社會各種制度的既有秩序 (Balhorn, 2018)。無論哪種方式，重點都放在制度及其對民主的重要性。O'Donnell（2012）將此稱為「制度性民主」，提供了一條民主促進與改革的道路。但制度性民主不是參與式民主的對立面，而是民主的另一個面向，它強調在社會中參與民主制度的重要性。

O'Donnell（2017）以英國政治為例，將制度民主定義為：

> 上述的制度民主不應被低估。它延伸到任何政治體系中的每個機構或組織，包括文化的，政治的和社會的面向（O'Donnell，2017，第 86-87 頁）。

因此，行動進程是在社會層面上設計的，且著眼於社會的轉型。這比學校所能或應該包含的範圍要大得多。然而，我們可以主張，學校能在發展制度性民主的進程中，以有意義且特殊方式作出貢獻。學校可追求兩個目標：其一，促進對社會政治體制的理解 ; 其二，確保學生能在學校生活中具有直接參與民主的經驗。

O'Donnell（2017）認為制度民主的概念對學校教育很有啟發性：

> 公民素養需要瞭解相關制度的「規則」，而且這些規則必須被解釋和學習。在任何制度脈絡下參與的必要訓練，最好能在特定的環境中進行，但有關組織中權力和獎勵的運作和分配的教育，應該與政治教育同時開始在學校中實施。（第 89 頁）

這項政治面向的聚焦，也回應了上述關於負責的社會公民的批評。年輕的公民需要參與政治，而 且他們必須學習並了解參與的意義，以及制度參與如何在不同的社會中發揮作用。與此同時，他們可以在學校和日常生活中體驗民主參與。理解民主並體驗民主必須作為當今年輕人公民教育的關鍵焦點。惟其如此，才能培養能夠支持民主價值和目標的負責任公民。

未來的公民教育會是什麼樣貌？

正規的學校課程需要有公民教育的一席之地。 它可以採取單一科目的形式，或與歷史或地理等相同領域科目整合的主題，也可以是融入所有學校科目的跨領域主題，或者是課外活動。Fairbrother 和 Kennedy（2011）表示，課程的實際形式並不是影響學生學習的主要因素，但他們的研究確實顯示：當公民教育是強制性的課程（任何形式的），對學生都有學習效果。因此，讓學生在學校獲得公民學習的機會是一個優先作法。

這種正式的課程需要向學生介紹使其社會具有特色的民主制度，這可以通過不同的方式完成，取決於學生的年齡，資源的取得以及教師的知識和技能。學生可以透過多種方式來了解這些制度，他們可以閱讀相關的資訊，實地參訪，聽取相關的演講，參加有關社區問題的辯論和討論，角色扮演議會和政治領導人的工作。學生也可以研究這些制度的歷史，相關的爭議性問題，對制度產生影響的領導人，以及這些制度在創建民主社會所扮演的角色。 最重要的是，學生需要學習如何參與這些制度，如何影響它們，如何利用它們以帶來有益於社會的變革。制度可能不是學生在公民教育中學習的唯一內容，但至少他們需要知道，沒有這些制度，就沒有民主。 預期的學習成果很簡單，但很有力：制度保證並保護自由，包括參與公民社會的自由。 沒有支持性的制度，就沒有民主。 如果學生理解這點，它將為參與生活提供堅實的基礎。

除了正式課程外，還有與公民教育學習成果直接相關的通用學習技能和價值觀。 這些可以被稱為 21 世紀的技能（Trilling and Fadel，2009），或者是工業 4.0（4IR）需要的技能（Kennedy，Pavlova & Lee，出版中）。 以下的技能被確定為 2025 年未來工作的關鍵：「分析思維和創新、主動學習和學習策略、複雜的問題解決、批判性思考和分析、創造力、原創性和主動性，領導力和社會影響力、科技使用、監測和控制、科技設計和程式設計、自我復原力、壓力承受能力和靈活性、推理、解決問題和構思」（World Economic Forum, 2020, p.36）。

與就業相關的技能中，前四名是：分析思維和創新，主動學習和學習策略，複雜的問題解決，批判性思維和分析。這些也是民主公民所需的技能，可以幫助未來的公民，在社會和政治問題上做出更有見識、更明智和更具策略性的決定。 例如，在新加坡，這些技能（儘管性質略有不同）被納入學科教學大綱，並在國家考試中佔據明顯的地位。 同時，新加坡降低對校本考試和測驗的重視程度，因此可以將更多時間用於發展這類的能力（Chia，2018）。

Kennedy 等人（出版中）也強調了 21 世紀價值觀的重要性，例如：公義，平等，寬容，社會正義，尊重和重視多樣性。與 4IR 能力一樣，這些價值就是是公民價值，因為它們代表了對當前和未來公民的期望，因此必須是公民教育的核心。

課堂也是有效公民學習的重要場所。許多研究顯示，建立討論公民議題的課堂開放環境（OCC），是促進公民學習的重要

途徑，包括：鼓勵學生相互提問和向老師提問，並營造一種環境，使問題的提出和討論成為課堂正常對話的一部分。 Kuang，Kennedy & Mok（2018 年，第 35 頁）發現促進這種環境的最佳途徑包括：良好的師生關係，父母能與孩子討論問題，提供富含知識的環境以便學生能更理解問題，發展公民自我效能感，讓學生獲得公民參與的經驗和理解，並讓學生參與課堂活動（尤其是對於容易「跳出頻道」的男學生）。 凡此種種，需要教師成為「學習的領導者」；即使學習領導者一詞通常是為校長保留的（Bendikson，Robinson&Hattie，2012，第 3 頁），但這個想法顯然也適用於教師。上述的班級經營需要教師的領導力，高層次技能，信心和承諾，其目的是為學生創造一個引導性的學習環境以促進公民學習。

課堂對於提昇公民學習很重要，但課外活動也很重要。Kennedy 等人（2014）指出，學生參與學校的公民活動（例如，在班級議會選舉中競選或參與某種形式的學校決策等），對學生的公民知識和理解具有直接和積極的影響。更進一步言之，校內公民參與程度較高的學校，也能強化學生的公民學習；也就是說，體驗式學習本身不僅僅是目的，它也有助於增進更正式的學習。因此，學校和課堂的領導者都可以為學生提供參與課堂內外活動的機會。

在課堂中，教師可以鼓勵學生參加班級議會，作為公民的單元學習或一系列課程的一部分，包括候選人、選舉和投票。這將有助於學生瞭解政治參與的正式過程，並為他們提供參與這些過

程的經驗。另一項活動是讓全班同學參與制定一套課堂規則，讓學生參與討論和辯論哪些規則應該適用，為什麼不遵守規則以及不遵守規則的後果是什麼。有創造力的教師可以想到更多類似的活動，以幫助學生認識到共同合作、尊重辯論和討論的重要性，以及如何在有不同觀點時達成共識。課堂可以成為學習如何與他人互動和聯繫的重要論壇，教師領導可以幫助實現這一目標。

學校處於社區之內，應成為社區組成的一部分。 正如 Li 和 Kennedy（2016） 所指出的，在校長認為社區資源可以協助學校的地方，公民學習可以得到加強。這顯示學校需要利用這些社區資源，要麼把它們帶入學校，要麼把學生帶入社區。無論是政治人物，非政府組織領導人，商業領袖，社區服務領袖等，都可以邀請當地演講者進入學校，他們可以為學校的課程或特殊活動做出貢獻。服務學習提供了一個很好的機會，讓學生通過連結當地企業，健康設施，非政府組織和政府辦公室等，體驗社區正在發生的事情。學生還可以熟悉當地的社會和政治問題，並擬定自己的計畫和方法來協助解決這些問題。這對於年輕人強烈感受到的環境問題尤其重要，因為他們大多認為這是一個社會問題，而不是政治問題。

然而，作為加強公民學習的一種方式，進入社區需要建立在良好的學校與社區關係之上，以便學校受到信任，且能彼此獲益。要實現這些目標，只有學校領導人能超越學校，採取深思熟慮的步驟並將學校融入社區，才有可能。校長可能處於最有利的執行位置，但所有教職員工也能參與協助學校更有目的地融入社區生

活。 共同使用體育設施，繼續教育課程，學校開放日，支援社區倡議等，都有助於將學校及其社區團結在一起；而做這些事情的理由是為了促進學生的公民學習。

結論

未來將是具有挑戰性的，它將是複雜的（無論是比以前更具挑戰性還是更複雜，都是一個有趣的問題，但本文未探討此問題）。未來的公民將需要一個堅實的知識 、技能和價值觀基礎來支持他們的公民生活：他們需要瞭解民主體制的重要性，如何為民主體制作出貢獻，以及如何重視民主體制。這是必要而非選擇性的；型塑公民場域（支持它、影響它、參與它）是公民發揮影響力和實現變革的唯一途徑，而堅強且可靠的民主體制將使未來的公民能夠做到這一點。 當然還有其他形式的公民參與也可適時運用，這些方式總是由民主體制所支撐和支援的。因此，它不單是制度性民主或參與式民主，而是兩者兼而有之。公民教育需要體認這種關係，並使年輕人既瞭解又願意參與這些制度，這需要創新的教育方法和民主的學校社群發展。民主雖非「必然」（Bennett，2008）；但學校需要盡最大努力，培養學生具備既瞭解民主也希望參與的見識，以確保形塑民主的機會。這是學校可以對民主的未來做出的重要貢獻。

參考文獻

Balhorn, L. (2018, May 23). Joschka Fischer's long march. *Jacobin*. Retrieved from http://auth.jacobinmag.com/2018/05/joschka-fischers-long-march

Banaji, S. & Buckingham, D. (2013). *The civic web - Young people, the internet, and civic participation*. MIT Press.

Bendikson, L., Robinson, V. & Hattie, J. (2012). Principal instructional leadership and secondary school performance. *Set, 1*. Accessed on 23 June 20121 from https://www.nzcer.org.nz/system/files/journals/set/downloads/set2012_1_002_0.pdf

Bennett, L. Changing citizenship in the digital age. In L. Bennett (Ed). *Civic Life Online: Learning How Digital Media Can Engage Youth* (1-24). The MIT Press.

Biglia, B. & Martí, J. (2014). Precarity. In T. Teo (Ed.) *Encyclopedia of Critical Psychology* (1488–1491). Springer.

Botha, M. (2014). Precarious present, fragile futures: Literature and uncertainty in the early twenty-first century. *Academy Review*, 31(2), 1-19.

Butler, J. (2004). *Precarious life: The powers of mourning and violence. Verso*

The Economist Intelligence Unit (2021). Democracy index 2020. Retrieved on 7 April 2021 from https://www.eiu.com/n/campaigns/democracy-index-2020/

Chia, L. (2018). Fewer exams, assessments in schools to reduce emphasis on academic results: MOE. Retrieved on 31 October 2018 from https://

www.channelnewsasia.com/news/singapore/exams-assessments-scrap-mid-year-primary-secondary-schools-10767370

Fairbrother, G & and Kennedy, K. (2011). Civic education curriculum reform in Hong Kong: What should be the direction under Chinese sovereignty? *Cambridge Journal of Education*, 41(4), 425-443.

Foa, R. & Y. Mounk. Y. (2017). The signs of deconsolidation. *Journal of Democracy*, 28(1), 5-16.

Freedom House. (2020). *Freedom in the world 2020*. Retrieved on 21 August 2022 from https://freedomhouse.org/sites/default/files/2020-

Fukuyama, F. (1989). The end of history? *National Interest,* Summer, pp 3-18. Retrieved on 7 April 2021 from https://www.jstor.org/stable/24027184

George, J. & Leidner, D. (2019). From clicktivism to hacktivism: Understanding digital activism. *Information & Organization*, 29(3), DOI: 10.1016/j.infoandorg.2019.04.001

Harlow, S. & Guo, L. (2014). Will the revolution be Tweeted or Facebooked? Using digital communication tools in immigrant activism. *Journal of Computer-Mediated Communication*, 19, 463–478.

Institute for Economics & Peace. (2020). Global peace index 2020: Measuring peace in a complex world. https://www.visionofhumanity.org/wpcontent/uploads/2020/10/GPI_2020_web.pdf

Kahne, J., Middaugh, J. & Allen, D. (2014). Youth new media and the rise of participatory politics. Working Paper No , Youth and Politics Research Networ. Retrieved from file:///C:/Users/85291/Downloads/Youth_New_Media_and_the_Rise_of_Particip.pdf

Kahne, J., Hodgin, E., & Eidman-Aadahl, E. (2016). Redesigning civic

education for the digital age: Participatory politics and the pursuit of democratic engagement. *Theory & Research in Social Education, 44*(1), 1–35.

Kahne, J, & Westheimer, J. (2003). Teaching democracy: What schools need to do. *Phi Delta Kappan, 85*(1), 34-40, 56-61, 63-66

Kennedy, K., Pavlova, M. & Lee, JCK. (in press). *Soft skills and hard values – Meeting education's challenges in the 21st century*. Routledge [Available from: https://www.routledge.com/Soft-Skills-and-Hard-Values-Meeting-Educations-21st-Century-Challenges/Kennedy-Pavlova-Lee/p/book/9781032113364]

Kuang, X., Kennedy, K. & Mok, MMC. (2018). Creating democratic classrooms in Asian contexts: The influences of individual and school level factors on open classroom climate. *Journal of Social Science Education, 17*(1). https://doi.org/10.4119/UNIBI/jsse-v17-i1-1678

Li, LJ. & Kennedy, K. (2016). Leadership for civic learning in Hong Kong: The role of school and community. *Asian Leadership Roundtable*, Singapore. Retrieved from https://www.eduhk.hk/apclc/roundtable2016/paper/Paper_Dr%20Li%20and%20Prof%20Kennedy.pdf

Lamprianou, L. (2013). Contemporary political participation research: A critical assessment. In K. Demetriou (Ed.). *Democracy in transition* (pp. 21–42). Springer-Verlag.

Li, H. (2021). *The relationship between regime "type" and civic education – The cases of three Chinese societies*. Springer.

O'Donnell, M. (2012, 30 April). Institutional democracy will strengthen our

society engaging citizenry and distributing power equitably. *British Politics and Policy Blog*, London School of Economics. https://blogs.lse.ac.uk/politicsandpolicy/institutional-democracy-odonnell/

O'Donnell, M. (2017). The democratic deficit: Institutional democracy. In in B. Jones & M. O'Donnell (Eds.) *Alternatives to Neoliberalism: Towards Equality and Democracy* (79-96). Bristol University Press.

Pasternak, A. (2019). Uncivil *disobedience in Hong Kong*. Stockholm Centre for the Ethics of Peace and War. http://stockholmcentre.org/uncivil-disobedience-in-hong-kong/

Smith, B., Krishna, A. & Al-Sinan, R. (2019). Beyond slacktivism: Examining the entanglement between social media engagement, empowerment, and participation in activism. *International Journal of Strategic Communication, 13*(3), 186-192.

Theocharis, Y., & van Deth, J. (2018). The continuous expansion of citizen participation: A new taxonomy. *European Political Science Review, 10*(1), 1–24.

Trilling, B., & Fadel, C. (2009). *21st century skills: earning or life in our times*. Jossey Bass.

V-Dem Institute. (2020). *Autocratization surges – Resistance grows - Democracy Report 2020*. Gothenburg: V-Dem Institute. Retrieved on 13 April 2021 from ttps://www.v-dem.net/media/filer_public/de/39/de39af54-0bc5-4421-89ae-fb20dcc53dba/democracy_report.pdf

Watson, J. (2012). Butler's biopolitics: Precarious community. *Theory & Event, 15*(2). Retrieved from muse.jhu.edu/article/478357.

World Economic Forum. (2020). The future of jobs report. World Economic

forum. Retrieved from https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

World Justice Project. (2021). Research and data. Retrieved on 8 April 2021 from https://worldjusticeproject.org/our-work/wjp-rule-law-index

4

Democratic Competence and Civic Education for the New Generation: The Challenge of Civic Education in the US, the Oldest Modern Democracy on Earth

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Summary

Political polarization in the United States has reached historic levels, not only in the form of competing ideologies but, increasingly, competing perceived realities, with broadcast and social media platforms creating filter bubbles that reflect, reinforce, and consequently intensify beliefs and enable the viral spread of misinformation (Hong & Kim, 2016; Pennycook, Cannon, & Rand, 2018; Bail et al., 2018). Collectively, these developments have created a crisis of citizenship, including increased disregard for democratic rules and norms, which in turn has created a crisis of democracy

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and of constitutional patriotism that center on “the norms, the values and, more indirectly, the procedures of a liberal democratic constitution” (Müller, 2007).

These circumstances call for a revitalized civics education to help rebuild this sense of constitutional patriotism in the digital age.

While previous projects may offer new perspectives on sustainable development, there are key concepts as part of Target 4.7 that require further careful analysis and criticism. The first concept is an understanding of education for sustainable development that is founded on the need to defend, protect, and enhance the global commons. Moreover, this model of education is concentrated on moving our education programs from an anthropocentric model into a biocentric model of education and training, endorsing a biocentric ethics. The second concept, which dovetails nicely with the first, is global citizenship education. Both concepts, which are intimately interrelated, may help to advance the defense of the global commons and social justice for the environment.

Traditionally the global commons have been conceived as the high seas, outer space, or the deep forest, areas that are owned by no one yet contribute to the support and survival of the planet, yet in Torres’ work (2017) there is another more powerful definition based on three propositions. The first proposition is that our planet is our only home, and we have to protect it through education oriented toward global citizenship and sustainable development. The second proposition is that the global commons is predicated on the idea that global peace is an intangible cultural good of humanity with immaterial value. And the third proposition is that

the global commons is based on the need to find ways that people, who are all equal, can live together democratically in an increasingly diverse and interconnected world.

The great question about peace and sustainability is how we can cultivate a spirit of solidarity across lines of difference. It will be important to explore how the key arguments by Hartmut Rosa in his book Resonance (2019) apply to the ways that nature and sustainability are treated in teaching and curricula. Does teaching about sustainability help us experience nature not only as a scarce resource but also as a sphere of resonance, which in turn enhances the motivation of individuals to desire nature's preservation and provides a rationale for sustainable practices? What is the framework that animates the teaching of sustainability in teacher training institutions? Is it related to the traditional trilogy of dimensions or crises of environmental, political, and subjective relationships? Rosa's argument is powerful because the root of this crisis in all three dimensions "is that the structurally institutionalized and culturally legitimized strategy of expanding humanity's share of the world paradoxically results in a progressive loss of world and thus in the muting of the axes of resonance" (2019, p. 427). In other words, an instrumental approach to nature, which may be subtly connected to moral and normative commitments, may seem betrayed by daily unsustainable practices. If this is true, this experience of self-efficacy may result in a reifying domination.

There is no question that Rosa's analysis poses all sorts of conundrums to the practice of sustainability and to eventual alienation in our relationship with nature. A crucial element for political ecology is the argument on the

escalation-oriented expansion of humanity dominating the late modern subject's relation to the self. Addressing this point has implications for sustainability education but also global citizenship education. How are these conundrums and contradictions treated in education? How are they understood in the context of the predominant normative and analytical metrics in teacher training institutions?

Global citizenship may help our planet and its people to advance global peace through its contribution to civic engagement in its classical dimensions of knowledge, skills, and values. There is a cosmopolitan imperative as suggested in the work of Ulrich Beck (1992; 2006; 2008), an imperative of economic equality, welfare, and cultural diversity that may produce individuals who admire others more for their differences than for their similarities.

The protection of global commons via global citizenship education needs to be supplemented by holistic conceptions of sustainability including its ecological, economic, and social dimensions. More than four decades ago, the Our Common Future Report of the World Commission on Environment and Development (WCED) created the basis for a holistic conception of sustainability that involves these three dimensions on a global level. While the ecological dimension is concerned with the maintenance of national capital, the economic dimension refers to companies' ability to create value and enhance financial performance. Simultaneously, the social dimension refers to social and cultural justice issues such as inequality and oppression.

Despite the important role of the social dimension in the study of

sustainability, research on sustainable development has often focused on the economic and environmental dimensions. Consequently, a social agenda is often neglected in the field of sustainable research. Sustainability research as well as international policies for sustainable development show that teachers are central and vital actors to educate new generations for sustainable development. With this background, teacher training education is considered as a crucial institution necessary to develop public awareness on issues related to social sustainability. However, we should also include other stakeholders such as progressive social movements and communities as well as Indigenous groups struggling to defend both the planet and the ability of institutions, families and individuals to seek ways to surpass the Anthropocene. The overall goal is to reach a post-human approach that may defend the environment allowing the planet to heal itself from human depredation.

Developing a New Civic Culture in the Civil Sphere: A Practical Model

The civil sphere, vital for the survival and advancement of constitutional democracy, is under attack on several fronts in the United States, including the filter bubble of social media, the viral spread of misinformation, the rise of economic inequality, declining trust in public institutions and science, and the growing sense among some that government is increasingly disengaged with the concerns and interests of its citizens collectively contributing to a deepening sense of political and social anomie. This proposal provides several points of intervention to enable young citizens to learn and practice the processes of informed democracy,

including:

- Interactive curricula designed to train students to think critically about social media and digital environments, replicating the scientific process in their critical examination of sources and arguments;
- The use of game-based activities to help support self-directed and motivated participation of students in exploring civics issues from multiple perspectives and thus enhance their sense of empathy and understanding through interactive and/or story-based games (Ryan, R., Rigby, C., and Przybylski, A., 2006);
- Summer institutes that train educators on effective pedagogical praxis in democratic education and train students on the process of deliberative democracy, focusing on policy discussion and development and its impact on diverse constituencies; and
- Inclusion of students in the decision-making process for the governance of their own educational environments.

Technical Rationale for a Summer Institute at UCLA in 2023-24

The January 6 assault on the U.S. Capitol Building, the decline in trust in public institutions (Rainie & Perrin, 2019) and in science and scientific reasoning (Nichols, 2017), the destabilization of social and economic relations due to the COVID-19 pandemic, and the rapid proliferation of misinformation in recent years collectively demonstrate the clear need for a revitalized sense of citizenship and of the norms, values, and processes of constitutional democracy in the United States. This process starts with education, and accordingly this project aims to provide several channels for applied, active learning at different ages to model, embody, and practice

those norms, values, and processes.

Civics education has traditionally focused on the teaching of constitutional democracy and affiliation with the nation-state. Three categories are linked to civics education:

- *Civic knowledge*, which in the context of constitutional democracy entails the knowledge of basic concepts informing the practice of democracy such as public elections, majority rule, citizenship rights and obligations, constitutional separation of power, and the placement of democracy in a market economy that is used as the basic premises of civil society;
- *Civic skills*, which usually mean the intellectual and participatory skills that facilitate citizenship's judgment and actions; and
- *Civic virtues*, usually defined around liberal principles such as self-discipline, compassion, civility, tolerance and respect.

This project aims to restore each of these categories in the (mis) information age with activities that revitalize the contemporary practice of citizenship through knowledge of the fundamental concepts and practices that inform constitutional democracy, cultivation of the skills that enable its protection and maintenance, and respect for and commitment to the values and virtues that ensure its survival. The proposed project specifically aims to support these goals through the items noted below.

In conclusion, we would like to invite the Foundation to contribute to the work that will be done at the UCLA Paulo Freire Institute in the summer of 2023. These summer courses are usually attended by a large number of Taiwanese graduate students, high school teachers, and administrators.

The first segment of this 22-day course is based on a project that schools in Arizona have implemented since 2013, educating students in the participatory school budgeting process as both a pedagogical tool and a tool for civic engagement. As a pedagogical tool, students learn democracy by doing. They learn to deliberate, listen to each other, collaborate, find solutions together, and promote the common good. As a tool for civic engagement, the project contributes to reducing the civic engagement gap, gives students a voice, and nurtures new generations of political actors willing to exercise their agency to improve society through electoral participation but also through involvement in volunteering activities and in social movements striving for environmental and social justice. At the end of each school participatory budgeting cycle, students vote using the same voting equipment that is utilized in local, state, and federal elections, which helps to demystify the electoral procedure. Moreover, after they cast their vote in the school's participatory budget, eligible students are provided the opportunity to register to vote in future elections. In the last few years, thousands of students have registered to vote through this process, supporting record voter turnout of Arizona youth, especially Latinx youth, in the 2020 elections.

A second topic in this course will be fashioned after the Model U.N. program to build and enhance civic engagement within the United States. This institute will provide an intensive course on key civics issues, policies, and practices at the local, state, and/or national level. Students will organize into teams to engage in research, dialogue, and deliberation on civics issues.

Students will explore, design, and present policy proposals and examine them from multiple perspectives.

Finally, a third module of this course will be an analysis of civic culture and civic education. In partnership with the UCLA Paulo Freire Institute, founded in 2002 and celebrating its 20th anniversary this year,, this summer course will offer university-credit courses that explore the theory and praxis of constitutional democracy and emphasize applied and action research projects on the practice of deliberative democracy and policy development at the local, state, and/or national level for elementary, middle school, and high school administrators and social science teachers. This institute for educators will focus on how civics education is taught in California, what improvements are needed for effective civics education, how dialogical citizenship can be taught effectively, and how the norms, values, and processes of constitutional democracy can be incorporated into teaching, research, and training. Particular emphasis will be placed on digital pedagogy and critical information literacy to help educators support students in critically navigating social media and other digital environments.

References

Bail, C. A., Argyle, L. P., Brown, T. W., Bumpus, J. P., Chen, H., Fallin Hunzaker, M. B., Lee, J., Mann, M., Merhout, F., & Volkofsky, A. (2018). Exposure to opposing views on social media can increase political polarization. *PNAS 115*(37), 9216-9221.

Beck, U. (1992). Risk society: *Towards a new modernity*. Sage.

Beck, U. (2006). *Cosmopolitan vision*. Polity.

Beck, U. (2008). *World at risk*. Polity.

Hong, S., & Kim, S. H. (2016). Political polarization on Twitter: Implications for the use of social media in digital governments. *Government Information Quarterly, 33*(4), 777-782.

Müller, J.-W. (2008). *Constitutional patriotism*. Princeton University Press.

Nichols, T. M. (2017). *The death of expertise: The campaign against established knowledge and why it matters*. Oxford University Press.

Pennycook, G., Cannon, T. D., & Rand, D. G. (2018). Prior exposure increases perceived accuracy of fake news. *Journal of Experimental Psychology: General, 147*(12), 1865-1880.

Rainie, L., & Perrin, A. (2019, July 22). *Key findings about Americans' declining trust in government and each other*. Pew Research Center. https://www.pewresearch.org/fact-tank/2019/07/22/key-findings-about-americans-declining-trust-in-government-and-each-other/

Rosa, H. (2019). *Resonance: A sociology of our relationship to the world.* Polity.

Ryan, R., Rigby, C., and Przybylski, A. (2006). Motivational pull of video games: A self determination theory approach. *Motivation and Emotion, 30*(4), 344–360.

Torres, C. A. (2017). *Theoretical and empirical foundations of critical global citizenship education*. Routledge/Taylor & Francis.

4-1
新世代的民主素養和公民教育：美國，地球上歷史最悠久的現代民主國家，其公民教育的挑戰

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摘要

美國的政治兩極分化已達到史上最高，不僅展現在相互競爭的意識形態，而且越來越多地表現為相互競爭的感知現實，廣播和社交媒體平台創造了反映、強化並因此激化信念並促成錯誤訊息的網路瘋傳（Hong & Kim, 2016; Pennycook, Cannon, & Rand, 2018; Bail et al., 2018）。總的來說，這些事態發展造成了公民危機，包括對民主規則和規範的日益漠視，這也導致圍繞於「規範、價值觀，與間接的自由民主憲法的程序」的民主和憲法愛國主義危機 (Müller, 2007)。

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這些情況需要我們重振公民教育，以協助重建數位時代的憲法愛國主義意識。

雖然之前的許多方案計畫可能已為永續發展提供新的視角，但目標 4.7 中的一些關鍵概念需要進一步仔細分析和批評。第一個概念是對永續發展教育的理解，它建立在捍衛、保護和提升全球公域 (global commons) 的需要上。進一步，這種教育模式著重將我們的教育課程從以人類為中心的模式轉變為以生物為中心的教育和培訓模式，支持以生物為中心的倫理。第二個概念與第一個概念非常吻合，即全球公民教育。這兩個概念密切相關，可能有助於促進全球公域的捍衛和環境的社會正義。

傳統上，全球公域被認為是公海、外太空或深林區，這些區域不屬於任何人，但對地球的支持和生存做出了貢獻，但在 Torres (2017) 的著作中，有更多基於三個命題的強有力的定義。第一個命題是：我們的星球是我們唯一的家園，我們必須通過全球公民教育和永續發展教育來保護它。第二個命題是：全球公域的基礎是全球和平是人類的無形文化資產，具有非物質價值。第三個命題是：全球公域的基礎是需要找到一種方式，讓所有人都平等的能夠在一個日益多樣化和相互聯繫的世界中民主地共同生活。

關於和平與永續的重大問題是，我們如何才能培養跨越各種差異的團結精神。檢視 Hartmut Rosa 在其著作 Resonance (2019) 中的關鍵論點非常重要，也就是運用對待自然和永續的方式在教學和課程中。永續的教學是否有助於我們不僅將自然視為稀缺資

源，而且引起共鳴，從而增強個人渴望大自然保育的動力並為永續實踐提供理由？在師資培訓機構開展永續教學的架構是什麼？它是否與環境、政治和主體關係的傳統三部曲的面向或危機有關？ Rosa 的論點是強有力的，因為三面向的危機導因於「結構制度化和文化合法化策略，擴大了人類在世界的份量，卻反而導致世界的逐漸喪失，從而導致共鳴的消失」 (2019, p.427)。換句話說，對自然的工具性方法或許與道德和規範承諾有微妙關聯，但人們日常卻都是非永續的做法。如果這是事實，這種自我效能的體驗可能會導致一種物化統治。

毫無疑問，Rosa 的分析對永續的實踐以及我們與自然關係的最終異化提出了各種難題。政治生態學的一個關鍵元素是人類以增長為導向的擴張主導了晚期現代主體與自我關係的論點。關注這一點對永續教育以及全球公民教育將有所啟發。教育中如何看待這些難題和矛盾？這些在師培機構主流標準化和分析性指標的背景下，如何被理解？

全球公民意識可以經由公民參與的三個典型面向，即知識、技能和價值觀來幫助地球和其上生活的人類推進全球和平。正如 Ulrich Beck (1992; 2006; 2008) 的著作所主張的，世界性不可或缺的是：經濟平等、福利與文化多樣性。這些會使人們更欣賞他人與自己的差異而不是相似之處。

透過全球公民教育保護全球公域需要輔之以永續發展的整體概念，包括其生態、經濟和社會面向。四十多年前，「世界環境與發展委員會」 (the World Commission on Environment

and Development, WCED) 出版的《我們共同的未來報告》(Our Common Future Report)，為全球層級這三面向的永續發展整體概念建立了基礎。生態面向關注國家資本的維持，而經濟面向則指企業創造價值和提高財務績效的能力。同時，社會面向是指不平等和壓迫等社會和文化正義問題。

儘管社會層面在永續研究中扮演重要角色，但永續發展相關的研究往往集中在經濟和環境層面，導致在永續研究領域，社會議程經常被忽視。永續發展研究和國際永續發展政策顯示，教師是教育新一代實現永續發展的核心和重要角色。在這種背景下，師資培訓機構被認為是提高公眾認識社會永續議題所必需的重要機構。但是，我們還應該包括其他利害關係人，例如進步的社會運動和社區，以及努力捍衛地球以及機構、家庭和個人尋求超越人類世 (Anthropocene) 的原住民群體。總體目標是希望取得一種「後人類」(post-human) 的方法，可以保護環境，使地球能從人類的掠奪中自我修復。

在公民領域發展新的公民文化：一個實用的模式

對憲政民主的生存和發展至關重要的公民領域在美國多方面受到攻擊，包括社交媒體的「個人化資料過濾」(filter bubble)、錯誤信息的網路瘋傳、經濟不平等的加劇、對公共機構與科學的信任度下降，以及某些人感覺政府越來越脫離美國公民的共同的關切議題和利益，導致政治和社會失範感 (social anomie) 的加深。因此以下方案提供幾個介入點，使年輕公民能夠學習和實踐「知

情民主」（informed democracy）的過程，包括：

- 設計互動式課程，以培養學生能對社交媒體和數位環境進行批判性思考，能在課程中經由對資料來源和論點的批判性檢視，能複製科學過程；
- 使用遊戲本位的活動，來支持學生從多個角度，自主和積極參與探索公民問題。據此，通過互動和 / 或故事本位的遊戲，增強他們的同理心和理解力 (Ryan, R., Rigby, C., and Przybylski, A., 2006)；
- 以暑期學院來培訓教師在民主教育中的有效教學實踐，培訓學生審議民主的過程，關注政策討論和發展，及其對不同選區的影響；
- 讓學生參與他們自己教育環境治理的決策過程。

2023-24 年加州大學洛杉磯分校暑期學院的技術理論基礎

2021 年 1 月 6 日對美國國會大廈的襲擊、對公共機構 (Rainie & Perrin, 2019) 以及科學和科學論證 (Nichols, 2017) 的信任度下降、COVID-19 大流行導致社會和經濟關係的不穩定，與近年來錯誤信息的迅速擴散，都表明美國迫切需要重振公民意識以及憲政民主的規範、價值觀和過程。這個過程應從教育著手，因此本計劃旨在為不同年齡段的應用、主動學習提供多種管道，以模擬、體現和實踐這些規範、價值觀和過程。

公民教育傳統上側重於憲政民主的教學以及與民族國家的聯

繫。公民教育涵蓋以下三個類別：

- 公民知識，在憲政民主的背景下，需要了解民主實踐的基本概念，例如公開選舉、多數決原則、公民權利和義務、憲法分權以及將民主置於市場經濟中被視為公民社會的基本前提；
- 公民技能，通常是指促進公民判斷和行動的智性和參與技能；
- 公民美德，定義通常圍繞自律、同情、文明、寬容和尊重等自由原則。

在此一 (錯誤) 資訊時代 ((mis)information age) 中，本方案希望重建以上項目，並透過活化現代公民教育的活動，這些活動包含了解構成憲政民主的基本概念和實踐、培養學生保護和維護民主的技能，以及對確保民主生存的價值觀和美德的尊重與承諾。本方案特別希望經由下列作法支持這些目標。

總之，我們想邀請 貴基金會為 2023 年夏天在加州大學洛杉磯分校保羅弗雷勒學院 (Paulo Freire Institute) 的工作做出貢獻。這些暑期課程通常有大量台灣研究生、高中教師、和行政人員參與。

這個為期 22 天課程的第一部分，係基於亞利桑那州的中小學自 2013 年以來實施的一個計劃，教育學生在參與式學校預算過程中，作為教學工具和公民參與工具。作為一種教學工具，學生通過實踐來學習民主。他們學會深思熟慮，互相傾聽，合作，

共同尋找解決方案，促進共同利益。作為公民參與的工具，該計劃有助於縮小公民參與差距，讓學生有發言權，並培養願意通過選舉參與，以及參與志願活動和社會活動，爭取環境和社會的正義。在每個學校參與式預算週期結束時，學生使用與美國各地區、州和聯邦選舉時相同的投票設備進行投票，這有助於揭開選舉程序的神秘面紗。此外，他們在學校辦理的參與式預算中投票後，符合條件的學生有機會在未來的選舉中登記投票。在過去的幾年裡，成千上萬的學生通過這個過程登記投票，支持亞利桑那州青年，特別是拉丁裔青年，在 2020 年選舉中的創紀錄投票率。

本課程的第二個主題將在實施模擬聯合國計劃之後制定，以建立和加強美國年輕人的公民參與。本學院將在地方、州和 / 或國家層級提供關鍵公民議題、政策和實踐的強化課程。學生將組隊，就公民問題進行研究、對話和審議。學生將探索、設計和提出政策建議，並從多個角度檢視這些建議。

最後，本課程的第三個模組將是對公民文化和公民教育的分析。與成立於 2002 年並於今年慶祝成立 20 週年的加州大學洛杉磯分校保羅弗雷勒學院合作，這個暑期課程將提供大學學分課程，針對小學、初中和高中行政人員和社會科學教師，探索憲政民主的理論和實踐，以及與地方、州和 / 或國家層級審議式民主的實踐與政策發展相關的應用和行動研究計劃。此一教育工作者的研究所將專注於加州如何教授公民教育，有效的公民教育需要改善之處，如何有效教導對話式公民教育，以及如何將憲政民主的規範、價值觀和過程納入教學，研究和培訓。將特別強調數位

教學法和關鍵資訊素養，以幫助教育工作者支持學生批判性地探索社交媒體和其他數位環境。

參考文獻

Bail, C. A., Argyle, L. P., Brown, T. W., Bumpus, J. P., Chen, H., Fallin Hunzaker, M. B., Lee, J., Mann, M., Merhout, F., & Volkofsky, A. (2018). Exposure to opposing views on social media can increase political polarization. *PNAS 115*(37), 9216-9221.

Beck, U. (1992). Risk society: *Towards a new modernity*. Sage.

Beck, U. (2006). *Cosmopolitan vision*. Polity.

Beck, U. (2008). *World at risk*. Polity.

Hong, S., & Kim, S. H. (2016). Political polarization on Twitter: Implications for the use of social media in digital governments. *Government Information Quarterly, 33*(4), 777-782.

Müller, J.-W. (2008). *Constitutional patriotism*. Princeton University Press.

Nichols, T. M. (2017). *The death of expertise: The campaign against established knowledge and why it matters*. Oxford University Press.

Pennycook, G., Cannon, T. D., & Rand, D. G. (2018). Prior exposure increases perceived accuracy of fake news. *Journal of Experimental Psychology: General, 147*(12), 1865-1880.

Rainie, L., & Perrin, A. (2019, July 22). *Key findings about Americans' declining trust in government and each other*. Pew Research Center. https://www.pewresearch.org/fact-tank/2019/07/22/key-findings-

about-americans-declining-trust-in-government-and-each-other/

Rosa, H. (2019). *Resonance: A sociology of our relationship to the world.* Polity.

Ryan, R., Rigby, C., and Przybylski, A. (2006). Motivational pull of video games: A self determination theory approach. *Motivation and Emotion, 30*(4), 344–360.

Torres, C. A. (2017). *Theoretical and empirical foundations of critical global citizenship education*. Routledge/Taylor & Francis.

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財團法人黃昆輝教授教育基金會 2021教育政策國際研討會 新世代、新教育 社會變遷中的人才培育