

Learning to learn: Grounding the Future of Education

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Abstract. The paper is a dialogue with Gregory Bateson and Alvin Toffler, prophetic thinkers that in the middle of the 20th century envisaged, and called for, the education of the future. We owe to Bateson the idea of “learning to learn”, on which he began to reflect in the 1940’s and kept thinking throughout his life. The idea was later taken up by Toffler in *Future Shock* (1970), where he wrote that “the illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.” The idea of learning to learn – as well as of metacognition – is widespread today, to the point of being considered one of the key competences needed in our time; however, it is still poorly understood and far from being applied as a guiding principle of educational practice in schools. The historical moment we are experiencing with the COVID-19 pandemic brings the urgent need for change in education, shifting from a paradigm based on merit to a paradigm based on competences. Urgency is an occasion but also a risk: the conditions of students with learning difficulties or in state of poverty might worsen and, overall, inequality might increase. A different, equal and deeply human scenario for the education of the future finds connections with ideas born in the 20th century and ready to germinate. Facing a future world of which we only know how different it will be from the present world, metacognition and learning to learn appear as the solid ground on which to build the future of education.

Keywords. learning to learn - metacognition - key competences - transdisciplinarity - educational psychology

1. Learning to learn: “the most important skill of all”.

In 2006, the European Union officially recognises the importance of learning to learn and places it among the 8 Key Competences for Lifelong Learning¹.

¹ Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC).

According to the 2006 Framework, ‘learning to learn’ is *the ability to pursue and persist in learning, to organize one’s own learning, including through effective management of time and information, both individually and in groups. This competence includes awareness of one’s learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully. [...] Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: at home, at work, in education and training.*

As a reaction to the inclusion of learning to learn among the key competences, instead of understanding and discussing the meaning of learning to learn and the role that the development of this competence would have in the students’ learning experience, it seemed that the scientific community focused on methods and tools for measuring learning to learn. Also this endeavor, without a sound and explicit theoretical framework and a shared understanding of the concept of learning to learn, turned out to be very challenging, because of both the complexity of the concept and the lack of agreement about its meaning².

Some research projects carried out in different European countries tried to explore how to measure learning to learn³. Furthermore, in 2005, the Analysis, Statistics and Indicators Unit of the DG for Education and Culture of the EU Commission asked the European Network of Policy Makers for the Evaluation of the Education Systems to develop indicators to assess and measure learning to learn as a skill.⁴

A 2008 JRC publication, titled *Learning to Learn: What is it and Can it Be Measured?*⁵, highlighted the need for an interdisciplinary approach to develop a clear definition of this complex skill.

In spite of this suggestion, researchers didn’t focus on finding a definition of learning to learn as a complex competence and eventually indicators for its measurement. Actually, in the 2018 Council Recommendation replacing the 2006 Key Competences Framework, the previous “learning to learn competence” was blend with a part of the “social and civic competences” under the new label of *personal, social and learning to learn competence*, loosening and lessening the power and impact that the previous formulation iconically had⁶.

² In the literature, intelligence or problem-solving are often considered very close to the definition of learning to learn (see Hoskins and Fredriksson, 2008).

³ See Kupiainen and Hautamäki, 2006; Meijer, Elshout-Mohr and Van Hout-Wolters, 2001; Elshout-Mohr, Meijer, Oostdam and van Gelderen, 2004; Meijer, 2007; Deakin Crick, Broadfoot and Claxton, 2004.

⁴ The test was administered in France, Italy, Cyprus, Slovenia, Finland, Austria, Spain and Portugal, and revealed several problems. Firstly, the definition of metacognitive abilities is influenced by cultural values. Secondly, it is hard to separate the influence of affective and cognitive dimensions (which influence each other’s) on metacognition. Thirdly, students report that experiences they had outside school have a stronger impact on metacognitive abilities than school experiences (Moreno, 2006).

⁵ Hoskins and Fredriksson (2008). The JRC (Joint Research Centre) is a Directorate-General of the European Commission, working as the Commission’s science and knowledge service. The JRC employs scientists to carry out research in order to provide independent scientific advice and support to EU policies (see https://ec.europa.eu/info/departments/joint-research-centre_en).

⁶ The new competence becomes “the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one’s own learning and career. It includes the ability to cope with uncertainty and complexity, learn to learn, support one’s physical and emotional well-being, to maintain physical and mental health, and to be able to lead a health-conscious, future-oriented life, empathize and manage conflict in an inclusive and supportive context.”

This choice has apparently bypassed the difficulties in defining learning to learn, taking away meaning and value of a unique construct. A 2020 JRC report (*European Framework for Personal, Social and Learning to learn Key Competences*), takes up the idea that learning to learn is *the most important skill of all*⁷ for facing the enormous challenges foreseen in the near future.

We agree on the statement “learning to learn is the most important skill” since it is at the foundation of any learning process, providing that its meaning is made clear. At this purpose, we propose to track the origin of the idea of learning to learn, tracing back through the statement and principles of Alvin Toffler in the 1970s to the first appearance of the concept in the early 1940s with Gregory Bateson. He shaped this concept at the crossroad of several disciplines he was exploring, embodying in his mental practise the principle of transdisciplinary enquiry. We believe that the original conception has the power to contribute to a fruitful understanding of this concept and of learning in itself.

2. Lessons from the past: Alvin Toffler and Gregory Bateson

In *Future Shock* Alvin Toffler wrote: «*the illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn*». It was 1970.

What we are living today as humankind is may be considered a shock: incredibly fast digital changes, climate change, the COVID-19 pandemic experience, and increasing inequalities (Cordini and De Angelis, 2021; Marmot and Allen, 2020). Toffler seems to predict what has been happening since the latest 90’s: everyone has access to a large amount of information, often inconsistent and in contradiction, but few of them have the abilities to filter and analyse what they listen or read.

In *The Third Wave* (1980), Toffler reflects on the changes occurred in the human civilisations and identifies three *waves*: the Agricultural, the Industrial and the Information Ages. In each of these three ages, humans have shaped corresponding skills. The Agricultural Age and the Industrial Age have in common routinary life rhythms and education systems accessed by a few. The Information Age, has changed completely the way of life for millions of people around the world because of the advent of computers, industrial and health technologies, and electronic communications. Toffler identified clearly the urgent need to change the paradigm of teaching, because he was able to foresee how fast changes would have occurred in the near future.

The concept of learning to learn originates in Gregory Bateson who coined the term *deutero-learning* in 1942. For Bateson, the reflection on learning is crucial because all the phenomena of communication – from those that interest genetics to those defined by the information sciences, crossing all the phenomena that the sciences of behaviour deal with – meet around learning. In this sense, his ‘learning theory’ has to do with the epistemological premises common to all living organisms, which is, in the end, the focus of Bateson’s interest.

⁷ Sala, A., Punie, Y., Garkov, V. and Cabrera Giraldez, M., LifeComp: The European Framework for Personal, Social and Learning to Learn Key Competence, EUR 30246 EN, Publications Office of the European Union, Luxembourg, 2020, p 57. The authors quote a sentence from EPSC (2019).

A law that allows us to describe communication phenomena – to which learning belongs – is the theory of logical types, contained in Russell and Whitehead's *Principia Mathematica*. The theory of logical types is made up of simple, and somewhat obvious, rules of formal discourse, the non-observance of which leads to paradoxes and fallacious discourse. According to the theory “no class can, in formal logical or mathematical discourse, be a member of itself; that a class of classes cannot be one of the classes which are its members; that a name is not the thing named; [...] that a class cannot be one of those items which are correctly classified as its non-members”⁸ since classes belong to an order of abstraction (i.e. a logical type) different from that of their elements⁹. The key is therefore the order of abstraction to which elements and classes belong.

Bateson's description of 'learning' takes into account the premise that learning is related to change. The change that is at stake in learning concerns the errors and the attribution of meaning (both closely connected to the context); in fact, I can speak of learning when I attribute a meaning to something to which I did not attribute it before, or when I no longer make an error that I made before. Applying the theory of logical types to learning as change, Bateson proposes a description that starts from the simplest level of learning, which he calls zero learning.

Zero learning is the case of the “specificity of response, which—right or wrong—is not subject to correction” and in which therefore “an entity shows minimal change in its response to a repeated item of sensory input”¹⁰. At this level there is no (more) learning, only execution, repetition, reaction.

“Learning I is change in specificity of response by correction of errors of choice¹¹ within a set of alternatives. Learning II is change in the process of Learning I, e.g., a corrective change in the set of alternatives from which choice is made, or it is a change in how the sequence of experience is punctuated. Learning III is change in the process of Learning II, e.g., a corrective change in the system of sets of alternatives from which

⁸ *The Logical Categories of Learning and Communication*, 1964, in Bateson (1972), p. 205.

⁹ Bateson explains this statement with an example: “If we classify chairs together to constitute the class of chairs, we can go on to note that tables and lamp shades are members of a large class of “nonchairs,” but we shall commit an error in formal discourse if we count the class of chairs among the items within the class of nonchairs. Inasmuch as no class can be a member of itself, the class of nonchairs clearly cannot be a nonchair. Simple considerations of symmetry may suffice to convince the nonmathematical reader: (a) that the class of chairs is of the same order of abstraction (i.e., the same logical type) as the class of nonchairs; and further, (b) that if the class of chairs is not a chair, then, correspondingly, the class of nonchairs is not a nonchair.” *Ibidem*, pp. 205-206.

¹⁰ *Ibidem*, p. 208.

¹¹ An organism can be wrong in many ways. “These wrong choices are appropriately called ‘error’ when they are of such a kind that they would provide information to the organism which might contribute to his future skill. These will all be cases in which some of the available information was either ignored or incorrectly used. Various species of such profitable error can be classified. Suppose that the external event system contains details which might tell the organism: (a) from what set of alternatives he should choose his next move; and (b) which member of that set he should choose. Such a situation permits two orders of error: The organism may use correctly the information which tells him from what set of alternatives he should choose, but choose the wrong alternative within this set; or He may choose from the wrong set of alternatives. [...] If now we accept the overall notion that all learning (other than zero learning) is in some degree stochastic (i.e., contains components of “trial and error”), it follows that an ordering of the processes of learning can be built upon an hierarchic classification of the types of error which are to be corrected in the various learning processes. Zero learning will then be the label for the immediate base of all those acts (simple and complex) which are not subject to correction by trial and error. Learning I will be an appropriate label for the revision of choice within an unchanged set of alternatives; Learning II will be the label for the revision of the set from which the choice is to be made; and so on”. *Ibidem*, p. 210.

choice is made”¹². The hierarchy could go on indefinitely even though learning III is already very difficult to occur and indeed, “to demand this level of performance of some men and some mammals is sometimes pathogenic”¹³.

Learning II – or learning to learn or “deutero-learning”¹⁴ – has to do with the way we segment experience, with the contexts to which we relate events and which, therefore, give them meaning and sense, and therefore with what we call ‘character’, ‘attitudes’, ‘values’. “These habits might all be, in some sense, by-products of the learning process”¹⁵. Schools and their practises of learning processes should therefore be called upon to reflect on how to ensure that their students view learning and learning contexts with interest and associate them with experiences of pleasure, satisfaction and self-fulfilment to be pursued throughout their lives.

3. The role of metacognition in deconstructing the misleading idea of meritocracy

Starting from Toffler’s statement about “the illiterate of the 21st century”, linguistic and mathematical illiteracy are still a crucial problem in Italy¹⁶ – recently worsened by the measures adopted to fight the COVID-19 pandemic (Milia et al., 2021). We assume in this paper that the learning to learn competence may be a very functional strategy to address these difficulties.

The first step to develop the learning to learn competence is to work on metacognition, which is the ability of a person to *think about her thoughts*. To define metacognition, we refer to Piaget (1959)¹⁷ who identified the age of around 11 as the moment when children move into the thinking “formal operational stage” and become able to reflect on their thoughts and do abstract operation on their ideas. Metacognition is an ability that everyone develops, however it is educators’ responsibility to lead students to focus on reflecting on the learning processes.

Metacognition corresponds to educational approaches committed to democracy and equity, which consider plurality and differences as strengths and education as an opportunity for all to develop personal and unique abilities, thoughts and values. Meritocracy corresponds to neo-liberal and capitalistic values that celebrate *talent, attitudes and individual abilities* and it has been defined as *a system that fosters and rewards effort, ability, and talent through competition to determine social standing*.¹⁸

¹² *Ibidem*, p. 214.

¹³ *Ibidem*, p. 214.

¹⁴ So it is defined for the first time by Bateson in the essay of 1942, *Social Planning and the Concept of Deutero-Learning*, in Bateson (1972).

¹⁵ *Ibidem*, p. 130.

¹⁶ According to the Italian Ministry of Education Annual Report about the results of INVALSI tests, in 2021 the 39% of students attending lower secondary school do not show sufficient linguistic competences and the 45% do not have sufficient mathematical skills for their age and level of education. The report shows also that 2021 results are significantly worse than 2019 results (+5 percentage points in linguistic competence area and +6 percentage points in mathematical skills); this confirms the hypothesis of a strong impact of the measures to contrast COVID-19 - as lockdown and distance learning - on students’ education, especially for students with learning and socio-economic difficulties (ISTAT and Save The Children, 2021).

¹⁷ Piaget, J. (1959). *The language and the thought of the child* (3rd ed.). Routledge & Kegan Paul, London.

¹⁸ <https://sociologydictionary.org/person/>

A misleading argument for the meritocratic discourse is that access to education is guaranteed for all. Instead of serving the cause of democracy and equity, the fact of formally giving access for all is instrumental to an economic system based on mass production and consumption. An access formally given is not enough: non-standard features in general – linked to neuro-diversity, physical disabilities, cultural capital, socio-economic status, minorities and immigrants' backgrounds, etc. – and the biases associated to them can result in unequal opportunities. Inequalities are experienced by many students since primary school and have a strong impact on their educational and then career paths (Bourdieu and Passeron, 1970; Reay, 2021; Mijis, 2019; Zivony, 2019; Crozier, 2018; Micheletta and Emili, 2013). Since 1947, at the Constitutional and legislative levels Italy is an excellence in the Western World in the field of access to education and inclusion of students with different needs, however there is a confusion between the condition of possibility and the possibility itself, still to be built. On one hand, as shown above, a high percentage of students do not reach the standard set by Italian Ministry of Education. On the other hand, very few students belonging to ethnic minorities go on to higher education: in Italy only the 1,7% of university students are second-generation compared to the 10% of students attending upper secondary school (INVALSIopen, 2018)¹⁹. Furthermore, students with disabilities²⁰ are the 2% of the total number of students enrolled at university²¹.

Thus, it seems quite clear that the current educational system doesn't meet the needs of students, especially the second-generation students and the students with disabilities and learning difficulties. It is also very hard to bring out clearly the intersectional aspect of learning difficulties, as, for example, how socio-economic difficulties have an impact on learning and school dropout (Nuzzacci et al., 2020).

In this historical moment, metacognition could have a pivotal role in overcoming the idea of meritocracy and in helping all students to develop the competences they will need in their future.

In fact, our world is experiencing a speed of technological transformation never experienced before, which calls for a great capacity to adapt to change. The paradox is that the socio-economic context requires people with skills in the area of logical-mathematical intelligence, but it does not obtain them. This failure can be partly connected to the fact that the request remains driven almost exclusively by the market, while it should be addressed by a vision of learning and education that is free from the logic of productivity. The corporate rules and goals are not applicable to education whose results cannot

¹⁹ ALMA LAUREA, 2020 <https://www.almalaurea.it/informa/news/2021/11/05/laureati-di-seconda-generazione#:~:text=La%20consistenza%20dei%20laureati%20di,1%2C7%25%20del%202020>.

²⁰ In Italy School (from primary to upper secondary levels) and University have different conceptions of "disability". In School neuro-diversities such as learning disabilities (that is dyslexia, dyscalculia, dysgraphia, dysorthography) are not classified as disabilities, while at University they are in the same category. Therefore, it is quite hard to obtain representative data about disability, because there are many disorders, difficulties and conditions which are considered disabilities at university (including psychiatric diagnosis), while data collected in upper secondary school consider only physical and cognitive disabilities (3%) and learning disabilities (4,7%).

²¹ <<Disabilità, DSA e accesso alla formazione universitaria>> – Anvur, 2021, https://www.anvur.it/wp-content/uploads/2021/04/ANVUR_Disabilita_4_maggio-def.pdf; Report ISTAT <<Alunni con disabilità A.S. 2020/21>>, <https://www.istat.it/it/files/2022/01/REPORT-ALUNNI-CON-DISABILITA.pdf>

be evaluated in the short term.

In this respect, Toffler was indeed prophetic: school has a fundamental role in giving people instruments and tools to face changes. He probably didn't know how fast world would have changed, but he knew that learning to learn (and to unlearn) is the basis of knowledge and adaptability.

This is where the educator has a major role to play: helping and guiding students to develop metacognitive thinking, strengthen their ability to think about how they learn and to know the emotions involved in learning, giving them the real opportunity to become active agents in their education and capacity to feel at home in changes.

Recognizing that learning to learn is *the most important skill of all* will help educators and researchers in education to re-think the role of school in the contemporary world. It is impossible to face inequalities if we keep on considering knowledge gained at school as something that is not influenced by what happens outside classes.

In a multicultural world, with increasing importance given to differences and neuro-diversities, schools should firstly work on the ability of reflecting about how we learn and what may help students to learn. It is an idea of education as a right and a real opportunity for all, funded on the development of the competence making individuals aware about how to *learn, unlearn and re-learn* and throughout all their life.

It is no longer a matter of a supposed meritocracy for a few, but it is a matter of fostering democracy and fighting inequalities through the most political action we have: education.

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