Learning to Learn

International perspectives
from theory and practice

Edited by
Ruth Deakin Crick
Cristina Stringher
Kai Ren

Foreword by Piero Cipollone, World Bank

Routledge

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Her research now focuses on processes of learning, adaptation and feedback in complex social systems. She has established a substantive research partnership with Engineers in the University of Bristol's Systems Centre, where she is a Co-Investigator in the International Centre for Infrastructure Futures which brings together stakeholders involved in renewing the UK's infrastructure systems. The Centre is developing a principled and generic learning journey framework for creating innovative, performance based business models to exploit infrastructure interdependencies. With colleagues at the Knowledge Media Institute of the Open University she has contributed to the creation of a new field of enquiry: dispositional analytics. www.learningemergence.net

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Julianne Willis, MEd, has worked in education for nearly 35 years, covering roles in primary through tertiary education in Australia. Over the last seven years, Julianne has been working as a consultant in public education, Catholic education, and independent schools. At the heart of her work is the search for ways in which learners can be empowered to learn to learn. 'Connectedness with the stream within' is a defining feature of her work.

Li Zhang is a lecturer in the School of Preschool and Special Education, East China Normal University, Shanghai. Her research focuses on the relationship between preschool experience and child development and early childhood education in rural China.

Foreword

Piero Cipollone

Being aware of one's own learning processes and preferences, together with ways to improve them, is a key educational objective for present and future citizens living in a constantly changing environment, not only to be more adaptive, but also to extrapolate one's own meaning out of life experiences. When I was a child, I used to live in a small village in southern Italy, where the local school was a place only for those who already had a well-educated family helping with homework. I had to develop a resilient attitude myself to go through the education system and take advantage of learning opportunities in higher education and beyond.

In 2010, I was appointed Executive Director of the World Bank Group to represent the constituency that includes Albania, Greece, Italy, Malta, Portugal, San Marino, and Timor-Leste. Before that, I was President at INVALSI, the Italian Institute for the Educational Evaluation of Instruction and Training. In this capacity, I met one of the editors of this book, Cristina Stringher, in late 2008 and entrusted her with the task to draft a comprehensive proposal to the Italian Ministry of Education contributing to the evaluation strategy of European Social Funds initiatives. She delivered the proposal and in early 2009 INVALSI eventually signed a convention with the Ministry to carry out projects in several areas to improve student learning and school accountability in deprived regions of southern Italy. Within this context, I encouraged Cristina to persist in her study of learning to learn with the ultimate scope to devise an assessment tool for this key competence for lifelong learning. This is how this book came about: Cristina presented her work at the EARLI Conference in 2011, Routledge editor Bruce Roberts found it of interest, and the book project was drafted.

We at the World Bank believe that education is a powerful driver of development. It is one of the strongest instruments for reducing poverty and improving health, gender equality, peace, and stability. Today, the World Bank is more committed than ever to expanding opportunities for children and youth and nations alike, through education. In 2011, the World Bank launched a new Education Sector Strategy 2020, 'Learning for All'. The strategy encourages countries to 'invest early' beginning in early childhood, 'invest smartly' in efforts proven to improve learning, and 'invest for all' focusing not only on privileged but on all students. The Bank is currently supporting countries to achieve the UN's Millennium Development Goals and to deliver the learning and skills necessary for all people to live healthy and productive lives. One of the key messages of the 2020 Strategy is that education should lead to more learning, especially during

schooling: 'the period between birth and young adulthood is especially critical because the ability to learn that is developed during this period provides a foundation for lifelong learning' (World Bank, 2011: 25). Fostering learning and learning how to learn should thus be one of the primary objectives of today's education systems worldwide.

The aim of this book was to gather and reflect upon the most updated knowledge accumulated internationally in the field of learning to learn from a multidisciplinary lifelong and lifewide perspective. To achieve this ambitious aim, Cristina initially contacted Ruth Deakin Crick and Kai Ren as co-editors. This nucleus then aggregated a pool of the best international researchers and practitioners in the field. Some of the contributors have previous experience in the European Network on Learning to Learn, others come from three different continents to represent not only a Euro-centric view of learning to learn, but a wide array of research and practice traditions.

Within the wider discourse of lifelong learning, the European Lisbon and 2020 strategy placed learning to learn among the eight key competencies that are needed in the global economy not only for professional reasons but also for personal fulfilment and social well-being. Elsewhere, learning to learn is considered an organizing concept in education, serving multiple needs such as educational system improvement and learner empowerment for active citizenship. The volume addresses these themes in a lifelong and lifewide perspective, ranging from theoretical explorations of what learning to learn is, to several theoretical contributions from psychology, sociology, and education. Research and practice on learning to learn are also addressed with chapters covering how to foster learning to learn from the very early years throughout school years up to adult learning in informal and non-formal contexts.

Learning to learn seems to serve also social needs when it is used as an organizing concept for reflective communities of practice. The crucial issue, however, is to establish what learning to learn is so it can be assessed in a variety of contexts and across age-ranges, assessment being the baseline to start from for its development. How to endorse this primary objective of education is connected to its development in different contexts: in education, at work, and throughout one's own individual and social life.

In synthesis, the book covers broad theoretical aspects with a view to concrete applications of learning to learn in several contexts and in lifelong learning, including but not limited to all school levels. Most importantly, this volume is meant to shed light on learning to learn for all, in a way that should in particular appeal to researchers, scholars, and practitioners interested in this malleable side of intelligence. To develop citizens in all parts of the globe.

<div align="right">
Piero Cipollone
Executive Director, World Bank
Washington DC, June 2013
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Acknowledgements

Introduction

Ruth Deakin Crick, Kai Ren,
and Cristina Stringher

More than ever before, the development of learning to learn is seen as crucial for success in the complex, unpredictable, and data-drenched world we share. Learning to learn is both a process and an outcome of formal education, together with other trans-disciplinary and lifewide competences. It goes deep into pedagogy and practice and is influenced by culture and context. As an outcome, it is a competence we aspire to measure and celebrate.

There are four drivers for the production of this book. First, the most comprehensive volume to date on this topic was published more than 20 years ago (Smith et al., 1990), while a wealth of research, both theoretical and empirical, has been revitalizing this domain of knowledge and practice at the start of the new millennium.

Second, learning how to learn is a crucial competence for human flourishing in twenty-first-century conditions of risk and uncertainty. It is one of eight key competencies identified by the European Union in the Lisbon and the 2020 strategies (European Communities, 2006). The European Union maintains a keen interest in this topic, as demonstrated by the European network of policymakers and several working groups on key competencies, including the creation of the European Network on Learning to Learn (Hoskins & Fredriksson, 2008). Internationally, learning to learn is emerging as a focus for school improvement and as a foundation for lifelong and lifewide learning. UNESCO (2013) has recently included approaches to learning as a key domain that should be an entitlement for all children, and one that needs to be assessed.

Third, language matters. There is a real need for serious debate about the term 'learning to learn', which is frequently used in different ways and in different contexts without clear definition. Often it is used within a conceptually narrow framework, limited to 'measurable' study strategies and learning styles (OECD, 2010) for which there is little evidence of success. There is an urgent need for a research validated foundation for learning to learn and what constitutes it.

Last, and by no means least, practitioners, university lecturers, teachers, and schools around the world encourage their students to take responsibility for their own learning and achievement – and for this they need to learn how to learn. Existing funds of knowledge are all 'out there on the Internet' and what matters is how individuals and teams make sense out of and utilize the mass of information that they are bombarded with every day. Dialogue between research

and practice is crucial to underpin this movement, generating a discipline of research-informed practice that frames and informs both commercial and policy interests. In the absence of a *pensée unique* (see Chapter 4 by Alberici and Di Rienzo), the global community of scholarship in education provides an important voice that should make a healthy, collaborative contribution to the formation of policy and practice.

Assessment of competence in learning to learn is a critically important policy ideal – one that the European Union embraced and embarked upon with its Learning to Learn Network. After some serious effort, we came to the conclusion that there are so many different approaches to learning to learn from across the EU, that it was impossible in 2007 to arrive at a consensus for its measurement. Before we can ever effectively assess something, we need to know exactly what it is we are measuring – as a matter of professional ethics. We also need to know what measurement models are most suitable and what is the purpose of the assessment before we develop our assessment technologies. This book reports on attempts at measuring some aspects, precursors, and dimensions of learning to learn, although a systematic approach to assessment of this competence is yet to be developed.

The book addresses five basic questions:

- What is learning to learn?
- What are its functions and what does it promise to the individual and society at large?
- How is it implemented in national curricula?
- How can we assess it?
- How can we develop it in a variety of contexts?

The book is organized in two parts.

1. *Theory*: Theoretical reflections on the concept, internal structure, and relational factors of learning to learn and how it develops.
2. *International Research and Practice*: (a) empirical studies into how learning to learn is used in practice; and (b) practitioner stories about learning to learn.

In Part 1, the opening chapter by Stringher presents a view of what learning to learn is and an integrated model, drawing on an extensive review, which provides an organizing concept for lifelong learning. In Chapter 2, Demetriou analyses learning to learn in the context of the functioning and development of the human mind. Learning to think or reason and learning to learn are seen as complementary aspects of the same adaptive process of tuning the mind with the environment. Deakin Crick then explores how complexity and holistic systems thinking can contribute to our understanding of learning to learn and the pedagogical conditions necessary to support this crucial competence. In Chapter 4, Alberici and Di Rienzo explain why learning to learn is important for individuals, groups, and for society at large throughout the lifespan and why learning to learn is

interpreted as a capacity for all, which eventually facilitates the development of democracy. In the closing chapter of the theoretical part of the volume, Ren addresses how the Confucian conceptualization of learning to learn as 'learning to be, to live and think, and to enjoy learning for life' has contributed to the lifelong learning culture in China and its implications for promoting competence in learning to learn worldwide.

Part 2 addresses international research and practice on learning to learn. In Chapter 6, Rao and colleagues discuss how attitudes and skills related to learning to learn are facilitated among Chinese learners in the home and preschool during early childhood. An account by Goldspink and Foster of an Australian learning to learn change initiative within the state education system in South Australia identifies complex lessons for school transformation and introduces the importance of learning-focused system reforms. Hautamäki and Kupiainen then consider how European regulations are affecting the conceptualization of learning to learn. Tensions between different epistemologies, different components to be assessed and ways to overcome them are discussed in this meta-reflection on the European pre-pilot study and on the Finnish learning to learn initiative. Moreno and Martín follow with a focus on how learning to learn has been developed in Spanish educational policy, research, and practice, including examples of a Spanish approach to the assessment of learning to learn. Stringher then describes a proposal for school improvement based upon learning to learn and argues that improvement actions should stem from clearly stated student, classroom, and school objectives, rather than from school effectiveness abstract reasoning or from mere statistical exercises. Linked to this theme of improvement is McCombs's chapter, which explains that less not more variables will get us where we need to be to support a whole learner model for school reform: what the students perceive as learning supports at school and classroom levels explains the most variance in a range of learning outcomes.

Three chapters conclude the volume, each with a unique practice experience related to learning to learn: Kloosterman reports on the European Learning to Learn research and practice project, with examples of activities for learners and trainers, and points to the need for an education system that can facilitate the generation and development of self-directed learners. Hipkins and Cowie, drawing on the New Zealand experience, maintain that learning to learn and lifelong learning, while obviously related, are differently focused, and each is deserving of explicit attention. In addition, lifewide learning recognizes that learners belong to, and that learning takes place in, multiple contexts and communities. The closing chapter by Willis portrays a professional learning journey which pursued strategies to support learning to learn capabilities in Indigenous Australian communities in the Northern Territory of Australia, offering a sensitive view of how disadvantaged learners can be empowered through learning to learn.

What becomes clear throughout all the contributions in this volume are two key themes: the complexity to be addressed in researching learning to learn and the value of international views and contributions.

Learning to learn is a complex process rather than either a simple or even a complicated one. In Chapter 2, Demetriou explores an architecture of mind that

incorporates four interrelated systems, all of which may be relevant to learning to learn. Each contributor proposes a complex mix of processes that coalesce into learning to learn – including affective, cognitive, and dispositional factors. All agree that learning to learn is about the promotion of self-directed learning, the cultivation of intrinsic motivation for learning, and the development of intentional agency on the part of the learner. All agree that contextual factors – such as pedagogy, assessment regimes, quality of relationships, and socio-cultural factors – together interact and influence the ability of an individual to learn how to learn and to become an agent in their own learning journey.

The implications of this complexity are enormous. As Morin (2008) argues (and Carl Gustav Jung before him), Western thought has been dominated by the principles of disjunction, reduction, and abstraction. Engaging with learning to learn as a complex process requires a paradigm of distinction-conjunction, so that we can distinguish without disjoining and associate without identifying or reducing. In short, we need to develop new and more holistic ways of understanding, facilitating, and enabling learning to learn in our education communities, so that we can hold in tension the inner personal aspects of agency, purpose and desire and dispositions and the more measurable external and public manifestations of learning and performance and collaboration with others in learning to learn. We need measurement models that can account for quality of trust as a core resource, and story as a vehicle for agency as well as the more traditional and familiar measures of performance and problem-solving.

If learning to learn is about human beings becoming self-organizing agents of their own lives, as our contributors suggest, then it is clear that 'top-down', transmission-oriented approaches to learning, teaching, and school improvement are no longer enough. The challenge is how to create the conditions in which individual students are able to take responsibility for their own learning over time. By definition, this cannot be done for them. It has to be by invitation, allowing learning to learn to emerge and fuel agency and purpose.

The establishment of the framework for international comparison of educational achievement provided by the OECD through the Programme for International Student Assessment (PISA) and the means for regularly compiling the data is a considerable achievement. It has provided an evidence base for governments to inform domestic educational policy and against which to allocate priorities (Hanushek & Woessmann, 2011). What this data set is less effective at revealing are the reasons behind international and regional differences: we still understand too little about what drives these broad numbers. Furthermore, the numbers continue to reveal deep, intractable challenges in education such as embedded disadvantage linked to geography, economics, and ethnicity.

There is a pressing need to assemble an internationally comparable set of data which can better inform our understanding of factors such as learning how to learn and how this varies within and between different contexts. The academic and theoretical work that has been undertaken on these issues to date, while rich and deep, has focused on aspects of the problem, often failing to cross disciplinary boundaries. The real-world challenge of educational improvement, meanwhile, is relentlessly trans-disciplinary, involving a complex interplay between social,

institutional, and individual factors. It presents a challenge both to theory and practice. The PISA data by comparison achieve comparability through the use of widely available proxy indicators but lack the depth and resolution needed to provide an understanding of the mechanisms driving the patterns that surface.

What is also clear from this volume is the value of different cultures in the debate about learning to learn. Two chapters are written explicitly from an Eastern perspective – demonstrating how Confucian philosophy can enrich our understanding of learning to learn and challenging some deeply held Western assumptions. Book contributors come from Australia, China, Cyprus, Finland, Hong Kong, Italy, the Netherlands, New Zealand, Spain, the UK, and USA. Uniquely, we report on a set of case studies from learning to learn projects in remote Indigenous communities where the cultural differences are enormous.

However comprehensive, this volume does not address a number of research and practice themes or leaves unanswered questions for further research. Among these, perhaps the most relevant is the road towards the assessment of learning to learn, although we provide a foundation for this through our contributions exploring what it is that should be assessed in learning to learn and why. Other open questions concern the deployment of learning to learn in school improvement; in the training of trainers, educators, and educational leaders; in personal development and empowerment. The connection of learning to learn with other key competencies, such as active citizenship and entrepreneurship, also requires further study.

This book draws on a rich, global tradition of research and practice. It is written by researchers and practitioners who care deeply about education and about learning how to learn in particular. Our purpose is to generate debate, to link learning communities, and to make a contribution to the ways in which societies worldwide are seeking to re-imagine their education systems. Our hope is that learning to learn will soon find a consistent place in educational policies worldwide.

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Part 1

Theory

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What is learning to learn?

A learning to learn process and output model

Cristina Stringher

Abstract

Learning to learn has become a widely debated issue, both politically and among the international scientific community, yet confusion remains about the difference between learning and learning to learn. Furthermore, in the scientific literature there is little agreement concerning definitions of the latter concept. The aim of this chapter, therefore, is to describe learning to learn and identify its features through definitions taken from the literature. The ultimate goal is to provide a sound theoretical basis for the further study of learning to learn from an empirical perspective and for more precise use of this notion in diverse learning settings. The methodology is a literature review yielding 40 definitions from 90 studies examined. Other products of these analyses on learning to learn (including a concept map and a list of practical functions leading eventually to a meta-definition and a process and output model) are based upon subsequent elaboration of this material, and reference to international literature on learning to learn and to Maria Montessori's works.

Key words: learning to learn conceptual definition, components, functions.

Introduction

The first chapter in any scientific endeavour is generally devoted to defining the topic sharply and describing it according to a chosen perspective. In our case, this is not an easy task. It could be argued that learning to learn is not strictly a scientific concept, but rather involves politics and this is the first difficulty when trying to develop a definition. Second, confusion remains about the difference between learning and learning to learn. From a practitioner's and student's perspective (experts, primary school children, graduate students, and teachers), it is clear that learning to learn cannot be easily disentangled from the concept of learning. Some individuals appear unable to conceive of the two different concepts: this is especially true for school children, but not only them, and this is no coincidence, as I will explore here.

One aim of the chapter, therefore, is to describe learning to learn through definitions taken from the literature and to identify those characteristics that

contribute to a meta-definition,[1] in an attempt to introduce the reader to concepts that will be analysed throughout this book. A more ambitious aim is to contribute some degree of order in learning to learn theory, avoiding reducing it to an umbrella term for all purposes: this reductionist position could take the scientific power away from a potentially powerful concept.[2] However, the complexity of this task is evident not only for the wide disparity of definitions to be found in the literature, but also considering that any meaning associated with learning to learn derives from how learning is conceptualized.

The scale of the challenge is evident in Moseley and colleagues' (2005) review, which incorporates 41 different frameworks or ways of understanding thinking and learning. However, learning to learn deserves an analysis of its own, since there seems to be little agreement about what it is and what it does. One way to achieve this discrete analysis is to present an account of learning to learn by identifying its features and providing a concept map, a list of its practical functions leading eventually to a definition and a conceptual model. The ultimate goal here is to provide a sound theoretical basis for the further study of learning to learn from an empirical perspective.

Let us start our journey with an overview of objectives attributed to learning to learn from different sources, some policy-led and others scientific. In 2010, the OECD published *PISA 2009 Results: Learning to learn – Student engagement, strategies and practices (Vol. III)*. The opening line of its foreword states that 'One of the ultimate goals of policy makers is to enable citizens to take advantage of a globalised world economy' (OECD, 2010: 3). The authors maintain that

> devising effective education policies will become ever more difficult as schools need to prepare students to deal with more rapid change than ever before, for jobs that have not yet been created, to use technologies that have not yet been invented and to solve economic and social challenges that we do not yet know will arise . . . Success will go to those individuals and countries that are swift to adapt, slow to complain and open to change.
>
> (OECD, 2010: 5)

In the same volume, the authors focus on those policies that may enhance students' reading competence and identify learning to learn as one of the keys to success. However, they do not define learning to learn and this phrase is used only in the title of the publication, with an attributed meaning ranging from learning 'motivation' and 'engagement', to 'study strategies' and 'approaches to learning'.[3]

It is widely accepted that empowering young people by creating favourable conditions for them to develop their skills so that they can work and participate actively in society is essential for the sound economic and social development of any country. In a context of globalization, knowledge-based economies, and ageing societies, every young person must be given the opportunity to fulfil his or her potential (European Commission, 2007: 1). Therefore, it is clear why

learning to learn has been included among the eight key competences by the European Parliament (2006).

Political interest at the European level matches and follows worldwide scientific interest in the concept of learning to learn: dozens of researchers have variably defined and explored it, sometimes from very different epistemological backgrounds, accounting for the diversity of approaches and the resulting interdisciplinarity (Bateson, 1977; Hounsell, 1979; Candy, 1990; Collett, 1990; Gibbons, 1990; Smith, 1990; Boekaerts, 1999; Hautamäki et al., 2002; Deakin Crick et al., 2004). Jules Henry (cited in Smith, 1990) states that learning to learn has been and still is humans' essential evolutionary task. Similarly, Edgar Morin (2001) maintains that knowledge of one's knowledge is a prerequisite for clarity of mind. Moreover, knowledge of one's knowledge, which implies the integration of the knowers with their own knowledge, is a necessary principle for education. We need negotiation and reciprocal controls between our own mind and our own ideas in order to allow reflexivity and to avoid reasoning pitfalls (Morin, 2001: 11, 31–33).

According to Goleman (1999), the most basic knowledge of all is that of knowing how to learn. This opinion is shared by many scholars who refer to it as not only a concept, but an educational objective (Tuijnman & Van Der Kamp, 1992), the most secure foundation for lifelong learning (James et al., 2007: 29), a fundamental competence, just like numeracy or literacy (European Commission, 2003), the most urgent item on the agenda together with educational reform for the development of people (Candy, 1990), and even an ultimate life skill for the twenty-first century (Burgogne, 1998, cited in Carr & Claxton, 2002, 9). Candy (1990), however, warns the reader not to make learning to learn a slogan in danger of losing its power through overuse. Twelve years after Candy, Coffield adds to this warning, stating that for too long learning to learn remained an empty expression, a vacuum slogan especially when – notwithstanding its unanimous utility – there is no consensus on its definition (Coffield, 2002).

In this chapter, I present a detailed account of methodological choices guiding this research, the products of the analysis of learning to learn definitions and models, along with a meta-definition and a concept map of the components of learning to learn. Together, these contribute to the construction of a process and output model, also discussed here. Provisional conclusions point to the need to synthesize this knowledge in a coherent learning to learn theory, which, I will argue, is preliminary to any empirical study of this notion. This work on a definition of learning to learn and learning to learn modelling is the basis for improving the assessment of learning to learn and for more precise use of this notion in diverse learning settings.

Methodology

The Campaign for Learning initiative in the UK recently published a review on learning to learn (Amalathas, 2010). The author maintains that 'some components of learning to learn may be found outside learning to learn models'

(Amalathas, 2010: 6), rendering the concept partial or flawed. This is not the view of this chapter: the search for definitions and components of learning to learn can be made within learning to learn research and models, provided one searches for studies dealing with a 'wide concept'[4] of learning to learn. The methodology used here is a qualitative review of worldwide literature with a comparative analysis of four major learning to learn models and 40 definitions from 90 contributions examined, accounting for a diachronic representation of learning to learn studies to date.

The literature review was based on the University of London's EPPI Centre process for systematic reviews of evidence. Major sources include the EPPI Centre, the Eric Database, the British Educational Index and other Ebsco databanks, together with a number of university and research centre web sites, Italian resources, and international journals available electronically.[5] The study was organized around one key question: How exactly is learning to learn defined? Sub-questions were concerned with how it is described in the literature: (a) What words/locutions can be considered synonyms for learning to learn? (b) What are its features, dimensions, components, and functions? (c) Is it possible to model them?

The literature search was carried out using the following key words: learning to learn, learning competence/competency, learning how to learn, learning power, learning about learning, independent learning, understanding learning, improving own learning, learning strategies, metacognitive learning strategies, learning-to-learn skills, study skills, ability to learn, and self-regulated learning. The initial search of these key words produced a total of 37,064 documents, which were screened with finer searches. This selection was performed by combining key words, the reading of titles, verification of the occurrence in the title of the words 'learning to learn' and not just 'learning', and availability of studies. In this way, 212 documents were identified for further scrutiny.

The schema shown in Fig. 1.1 provides an overview of the initial literature search: in the large oval, key words used to interrogate search engines have been grouped. Literature that was of policy versus academic origin was examined. Psycho-sociological fields contributing to learning to learn are highlighted in the smaller ovals, while in the background or at the core of each field lies evaluation and assessment studies in formal education.

The 212 documents identified in the previous phase were further scrutinized through reading of abstracts. This resulted in 90 studies, mostly theoretical in nature, dealing specifically with the target topic. Of these, 40 were incorporated into the review based on the criterion of presenting a different definition of learning to learn.[6] All 40 definitions were integrally extracted with their bibliographic reference. They were then coded into categories and classified based on the following parameters: research background (political vs. academic), research paradigm, specific epistemic approach, components and functions of learning to learn. With the aid of cross-references, it seems reasonable to consider these studies as representative of major trends in international learning to learn research, summarized in Table 1.1 in the Appendix.
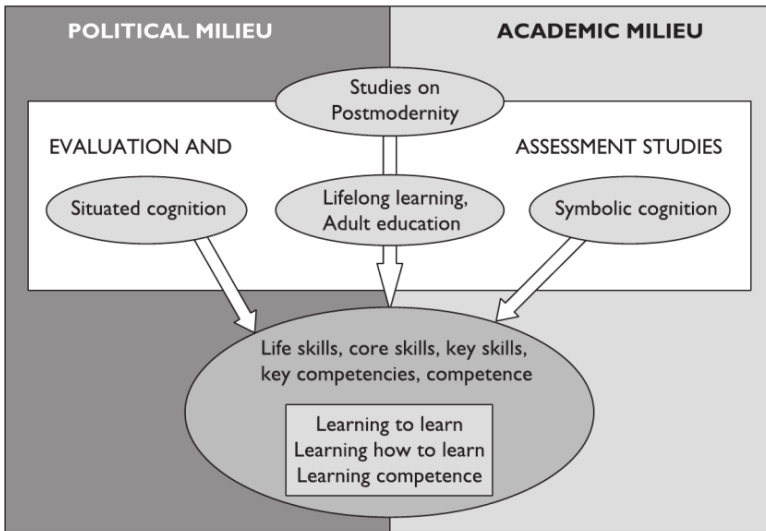
Figure 1.1 Schema for the initial literature search.

The disparity in approaches is one feature of this field of study. Definitions of learning to learn can be classified according to two main research paradigms[7] (lifelong learning and developmental psychology) and study approaches (cognitive, socio-cultural, historical, etc.). Of the 40 definitions collected, 32 can be classified as belonging to the lifelong learning paradigm and eight to developmental psychology. The cognitive and metacognitive approach[8] is equally distributed across learning to learn studies belonging to the two paradigms. Within paradigms, the socio-cultural approach prevails in lifelong learning, while the cognitive approach is exclusive to developmental psychology.[9]

Following this classification, a list of learning to learn components from all the 40 definitions was compiled,[10] together with a list of functions attributed to learning to learn. Other products of these analyses (including the concept map and the model) were based upon subsequent elaboration of this material, reference to international literature on learning to learn, and to Maria Montessori's works.

Results

The main objective of this study was to understand what learning to learn is in order to derive a meta-definition.[11] The analyses produced the following study outputs: two paradigmatic definitions of learning to learn (one per study approach, the cognitive and socio-constructivist); a selection of four full learning to learn models with functions; a list of 523 learning to learn components enabling a distinction to be made between this and related concepts, which helps

to determine what learning to learn is not; key features of learning to learn with a concept map synthesizing the component list into 46 macro-components; a meta-definition with learning to learn functions; a synthesis and output model created from an aggregate of macro-components previously identified. The products of analysis are presented below.

Paradigmatic definitions

Two definitions are reported here so as to provide evidence of the different approaches to learning to learn (Box 1.1).

Models of learning to learn

A selection of learning to learn models was made based on their comprehensiveness, their capacity to explain learning to learn, and their significance for lifelong learning. The following models meet these criteria: the Alberta Project (Collett, 1990), Gibbon's Cube (Gibbons, 1990), the Learning to Learn Framework of the University of Helsinki (Hautamäki et al., 2002), and the ELLI Project (Deakin Crick et al., 2004). A description of each model can be found in the Appendix.

All of these authors share the idea that learning to learn can be attained throughout the life span, and that this has deep consequences for policies to foster its acquisition: if learning to learn were to be developed only during the school years, one consequence would be to avoid empowerment interventions for adult learners, while learning to learn is probably one of the most important drivers of change in adulthood. Although diverse epistemologies guided these research studies, similarities are evident among them. They all share the comprehensiveness of the concept of learning to learn, which is not confined to study strategies or to strictly cognitive or metacognitive variables, but includes the regulation of affective and motivational components. All models underline the importance of the social environment and of situated learning (and learning to learn), best displayed in interaction with others.

Learning to learn clearly lends itself to a competence adults could exploit in their working lives, but the abilities and competencies it mobilizes can be taught in all phases of education and independently of a concrete and immediate application to a certain working situation. The seven learning dimensions identified by the ELLI Project, for example, seem to be equally important during the school years and in adulthood, as a deep search for individual meaning, self-understanding, and self-construction.

The differences in these models relate to their intended recipients, to differential foci attributed to learning to learn components, and to diverse applications of this notion: for the Alberta study, the target group were low performing adults and the scope was a specific pedagogic intervention; for Gibbons, the intent was to systematize learning to learn in a theoretical frame with a developmental perspective, with application in three domains (technical, social, developmental); for the research team at Helsinki, the target groups were children, teenagers, and

Box 1.1 Paradigmatic definitions of learning to learn

Cognitive and socio-cultural approaches to learning to learn

An example of the cognitive and metacognitive approach to learning to learn:

> An efficient learner needs five elements: a) motivation to employ learning abilities and techniques; b) an organized knowledge base, providing a structure for new knowledge; c) skills for future learning; d) strategies for the optimal use of those learning skills; e) meta-cognitive strategies (planning and control in the first place).
>
> (McKeachie, 2000)

An example of the socio-cultural-historical approach to learning to learn:

> [Learning to learn] is a developmental process in which people's conceptions of learning evolve and become consciously available to systematic analysis and review. It involves the acquisition of a repertoire of attitudes, understandings, and skills that allow people to become more effective, flexible, and self-organized learners in a variety of contexts. It occurs both prior to, and coincidental with, learning endeavors. It may be enhanced through processes of formal schooling and the way in which the curriculum is constructed and is therefore a viable – perhaps crucial – objective for educational systems at all levels. It involves entering into the deep meaning structures of material to be learned and, in its most advanced forms, may lead to critical awareness of assumptions, rules, conventions, and social expectations that influence how people perceive knowledge and how they think, feel, and act when learning.
>
> It has both generic and context-specific components. It is a multidimensional entity whose meaning varies according to the meaning given to the word learning.
>
> (. . .) if learning means roughly 'an interpretative process aimed at the understanding of reality', then 'learning-how-to-learn' means something like 'an interpretative process aimed at understanding how to interpret and understand reality'.
>
> (Candy, 1990)

adults, while the objective was to develop indicators for school system evaluation;[12] for the Bristol group, the target was similar, while the scope was rather to elaborate an empowering pedagogical intervention.

This seems to be a major point for discussion: the Helsinki model is concentrated on the development of policy indicators and its definition of learning to learn seems to reflect the need to form a nation of 'good learners' but also of adaptive citizens, willing to adapt (and accept) novel tasks from others, such as business and other social players. The emphasis of Bristol's ELLI Project is instead on learning power contributing to lifelong personal development. The strategic strengthening of individuals is the core of the Bristol, Gibbons, and Alberta models, while from this perspective Helsinki's seems the most heterogeneous of the models analysed.

Learning to learn in its wider sense shares many similarities with such concepts as Gardner's intrapersonal, Sternberg's practical, and Goleman's emotional intelligence (Gardner, 1983; Sternberg et al., 1990; Goleman, 1999). In addition, it seems a candidate to fit Gardner's eight criteria for identifying a new intelligence.[13] Most of all, learning to learn is somehow transferrable, and thus teachable.

Learning to learn functions

Knowles anticipated current views on the functions of learning to learn when he warned against the 'catastrophe of human obsolescence', which can be contrasted with lifelong learning (Knowles, 1990). From his perspective, learning to learn is an indispensable human survival tool. For Smith (1990), learning to learn has its roots within the lifelong learning paradigm that emerged after the First World War. Exacerbating this trend after the Second World War, the acceleration of social change highlighted the need for lifelong learning and adult learning. Smith (1990) reports that in 1967 Bergevin already maintained that learning to learn was the primary objective for adult learning, and in 1971 Tough pointed out that participation in adult education programmes increased self-directed learning.

According to these models and the wider literature search, learning to learn comprises multiple functions, in at least two main areas: learner self-improvement and social improvement. Box 1.2 incorporates learning to learn functions classified in this way.

Box 1.2 Learning to learn functions

Learning to learn functions according to literature

Learner self-improvement, where the focus is:

- to contribute to general self-improvement and pursuit of Socratic examined life (Collett, 1990; Gibbons, 1990; Deakin Crick et al., 2004);
- to help learners feel more self-confident (Collett, 1990);

- to develop stronger problem-solving skills (Collett, 1990);
- to help learners improve their learning and become more strategic, responsible, autonomous, and collaborative rather than independent learners (Weinstein & Van Mater Stone, 1996; Deakin Crick et al., 2004; James et al., 2007);
- learner development (Diez & Moon, 1990);
- learner adaptability (Bateson, 1977; Hautamäki et al., 2002);
- to develop self-reflective power and awareness functional to individuals' learning and life needs (Hautamäki et al., 2002);
- to allow knowledge, skills, and attitudes to be transferred from one learning context to another and from learning situations in which this information has been acquired to a leisure and work context (Boekaerts, 1999);
- to aid in the search and development of (self-) meaning (Candy, 1990; Gibbons, 1990; Deakin Crick et al., 2004);
- to guide concrete learning and allow optimization and regulation of learning processes (Puustinen & Pulkkinen, 2001; Weinert, 2001);
- to allow the individual freedom of self-determination (in the developmental domain, the product being a well-functioning adulthood) with the possibility of individual change, self-construction, and empowerment (Gibbons, 1990; Alberici, 2008);
- to aid students with learning difficulties (Cornoldi et al., 2001);
- to manage one's own career path (European Commission, 2004c).

Social functioning of individuals and society, where the focus is:

- to maintain and update basic knowledge and competencies in times of socio-economic change (Eurydice, 2002);
- to enhance productivity (in the technical domain, the product being control over practical tasks) (Gibbons, 1990);
- to enable individuals to relate to others (in the social domain, the product being social integration) (Gibbons, 1990);
- to contribute to the creation of 'a nation of good learners' (Hautamäki et al., 2002);
- to cope with growing complexity, uncertainty, and individual responsibility (Carr & Claxton, 2002);
- to equip young people to learn from and for real-life situations (Carr & Claxton, 2002);
- to foster personal development and a well functioning society (European Commission, 2002):
- to be able to survive, to develop their full capacities, to live and work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions, and to continue learning (World Conference on Education for All, 1990).

To summarize, learning to learn serves developmental, functional, and empowering functions: youth development is the primary learning to learn mission according to developmental research, while according to the lifelong learning paradigm, learning to learn serves the adaptation to working and domestic life, including the creation of balanced personalities and social well-being.

Learning to learn components and concept map

The qualitative analysis of the extracted definitions yielded 523 initial components of learning to learn. After removing duplications, 146 components, sub-components, and descriptors remained, which have been logically grouped into 46 macro-components. Both the resulting map and the model presented in the following pages have been systematized according to Montessori's (1993, 1999, 2000, 2009) work. The choice of Montessori as a pedagogic lens may not be without bias, but it was considered coherent for several reasons. The Montessori perspective is topical precisely because her method does not translate any theory into practice:[14] Montessori starts with an accurate observation of the child and derives protocols for intervention from there. It seems she deliberately privileged this grounded approach rather than an elegant theoretical systematization of her observations. In the first page of her book *The discovery of the child* (1999), Montessori states the purpose of her research, which is not to elaborate a treatise on the science of education, but rather to present the results of a teaching experience.

The teaching experience is her starting point, practical applications the end point, and scientific experiments the means, in a praxis-to-praxis model that is unique compared with other educational thinkers. As a result of her systematic observation of the learner within the prepared environment, Montessori maintains individuals are all motivated to learn from innate curiosity. A teacher's aim is thus to cultivate and respect this inherent desire to learn. Montessori's foundation for learning to learn can be traced in these basic educational principles and key concepts:[15]

- A science of education does not only have the task of observing children, but to transform them into better humans, into autonomous yet disciplined observers and researchers which may improve the future progress of mankind (Montessori, 1999: 33, 54, 103–104).
- Education is the active aid to the normal expansion of life (Montessori, 1999: 67).
- The individual has an innate desire to learn, which triggers intrinsic learning motivation, learning endeavours, and learning how to learn: no-one can concentrate by imitation (Montessori, 1999: 107–108).
- 'Psychological development is self-organized with the aid of external stimuli, which must be experimentally determined' (Montessori, 2000: 63).

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