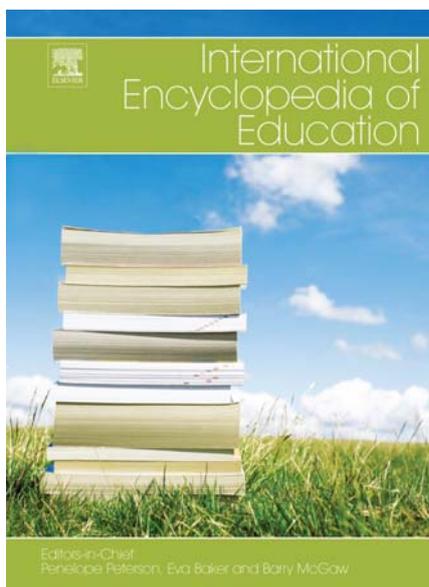


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## Assessment in Schools – Learning to Learn

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### Introduction

Globalization and the development of information technology (IT) have set new challenges and options for education. Factors pertaining to lifelong learning are gaining momentum in educational discourses. The concept of learning to learn (L2), that has a central position amid the cross-curricular competences, has been adopted in response to these demands. Especially within the European Union, L2 has a place among the key competencies intended to be catered by educational policy considerations (Centre for Research on Education and Lifelong Learning (CRELL); Fredriksson and Hoskins, 2007).

L2 is used to refer to two diverse domains of discourses. On the one hand, L2 refers to the cognitive and affective-dispositional factors central to the application of existing skills and schemata to novel tasks and to new learning (commitments) in adult life and in the constitution of knowledge at work. On the other hand, L2 refers to potential new educational practices in basic or adult education – which would increase the appeal of education and learning to all pupils in order to enhance the acquisition of skills, abilities, and dispositions necessary in future society. Depending on the approach, there are also differing answers to the question of the criteria of L2 (Klauer, 1988). Different answers lead to different choices in assessments.

L2 is to be seen to comprise and adhere to several theoretical traditions within educational sciences. Even if, in psychology, L2 refers to repeated practice with tasks in which material varies, which enhances learning of new material, there is no general agreement in the educational literature on the definition of L2. On a general level, the search for an understanding of L2 can be seen to fall under Hirsch's (1996) Tool Conception of Education. Hirsch's idea comprises notions such as accessing skills, critical-thinking skills, higher-order skills, lifelong learning, metacognitive skills, and problem-solving skills. The L2 notion embraces this idea of general tools formed through good teaching, but acknowledges many structural constraints embedded in learning and development. Yet, L2 should be more than a set of study or survival skills (Smith, 1990). Study skills, strategies, and techniques with the related dispositions and beliefs may be the narrow(est) area of L2, but there are also attempts to broad(er) interpretations (Claxton, 2007; Hautamäki *et al.*, 2002).

L2, as an assessment issue, can be approached applying Snow's 1990-model for educational assessment. When L2 assessment is based on learning tasks that require

reflection and adaptation by the student, the tasks of the assessment exercise can be seen as both aptitude (input) and achievement (output) assessment and also to tap students' attitudes or beliefs. Snow (1994) shows – in his extended model – that, before being accepted as a task, an assignment or an exercise activates the orientation to task type, subject-matter characteristics (relevance to learner, novelty to learner, dominant symbol system, etc.), treatment dimensions (ambiguity, risk and evaluation, stress and importance of outcome, novelty, meaningfulness, complexity of information processing required, structuredness and completeness, adaptiveness to learner, etc.), and the instructional-social context. Sometimes, these orientative actions are considered to be the core of L2, together with components or elements which have been referred to as metacognition (after Flavell).

L2 leads to a state of mind which could be named: the prepared mind of Shayer and Adey, the epistemic mentality and resilience of Claxton, or the autodidactic learner of Klauer.

### History of L2

#### Early History

Cronbach and Snow, in their treatise on aptitudes and instructional methods (ATI; 1977), point out that any study of aptitude–outcome relations ought to take learning-to-learn (Cronbach and Snow use the acronym LTL) into account: “A learner does considerably better after he has experience with many tasks of the same kind. The learning ability he displayed on the first few tasks of that series may not be the most significant indication of his ability to perform in an instructional situation or in any long-continued learning. This understanding leads to a definition where LTL is defined as a repeated practice with one kind of tasks but learning different material each time, which facilitates the ability to learn new material.”

The early start for this definition is in Harlow's (1949) studies on monkeys' learning. He demonstrated L2 – or learning set – by teaching monkeys discriminations between pairs of objects. Harlow used two experimental conditions: (1) the oddity problem, where the correct answer is determined not by the choice of one stimulus as correct but by the application of a concept: “3 stimuli, two alike, choice of the odd object is rewarded.” A subject who discovers operating rule is able to solve a new problem on the first trial. (2) The learning-set problem, where one of two objects is arbitrarily chosen as correct. Subject cannot

choose correctly on the first trial save by chance, but he can achieve perfect success on the second trial. The second type of study gives evidence of L2.

### Later History

Later cognitive and developmental psychological traditions have provided the understanding of thinking and higher cognitive functions as malleable (theoretical ideas by Adey, Bruner, Flavell, Demetriou, Gardner, Klauer, Kuhn, Markman and Gentner, Nuthall, Piaget, Resnick, Shayer, and Sternberg). In this tradition, one can emphasize – when constructing a framework for assessments – the different modes of the tasks, automated skills in new contexts, identifying and using propositions, or mental tools. In the cognitive domain, critical thinking, problem solving, use of resources and rules, and formal operational reasoning are core skills. By combining differential-experimental and developmental traditions, Resnick (1987) showed the importance and possibility of thinking about thinking as something to be learned and accordingly teachable.

Flavell introduced metacognition, which has, since, made a major impact on learning studies. Sometimes, the term is used to refer assessments where the learning activity itself and acts of learning have vanished and metacognition is disembodied from cognition and reasoning as something independent. However, to plan, to monitor, and to evaluate learning activity is paramount in regulating learning. It is possible to test pupils for their knowledge of them (Meijer, 2007).

The sociocultural tradition (theoretical ideas by Bruner, Claxton, Cole, Galperin, Leontjev, Lompscher, and Vygotsky) can provide ideas relating to learning activity, to relations among motives, goals, and actions, to the roles of context factors and significant others, and to the general idea of an epistemic mentality. The contextual variables, which should be taken into account in analyzing the conditions and implications of L2 assessment, include not only the school, class, and teachers but also students' interpretation of the attitudes of their parents and peers toward school. These relate to students' self-efficacy and not only to students', but also to teachers', understanding of L2 as well.

The motivational and volitional tradition (theoretical ideas by Atkinson, Covington, Harter, Little, Niemivirta, Pintrich, Shavelson, and Skinner) attests to both positive and negative effects of beliefs in goal-oriented action. Even if the motivational, volitional, and dispositional factors can also be analyzed independently, it is important to remember that dispositions do not replace mental activity or the use of mental powers to solve tasks and to learn. All mental acts – based on comparing ideal goals and representations of the actual situations – produce emotions (happy when a goal is achieved, sad when there is a discrepancy). Therefore, cognitive development is tied to

the development of also mastering emotions. Emotions, interests, and other dispositional factors assist reasoning, and as teaching or an intervention increases children's abilities, their belief in those abilities also changes, slowly leading to a process of growth of self-concepts and self-awareness. Accordingly, only studying and assessing generalized emotions as beliefs, orientations, and motivations will not provide a complete description of the status of L2 in some school class or in school.

### Current Trends in Assessment

Theoretically, the link between L2 competence as a cognitive process, and the will or attitudes and beliefs that steer its use, can be built through the construct of the autonomous personal control in the upkeep of reflective thinking and the self, learning, and personal development. Seen from this perspective, the concept of L2 is closely attached to those of voluntary learning (Vygotsky and Lompscher) and goal-directed action (Leontjev, Nuttin, and several other modern writers).

Students' goals at school are seen to be linked to learning tasks that the teacher gives and students are expected to accept them as their own. In this process, the outer social context is to be replaced – for a moment – by the inner context of the self. Then, the solution – be it positive or negative – will be evaluated by the student on two fields. Social comparison and achievement assessment tie it to the social system – to teachers, classmates, and parents – whereas inner evaluation ties it back to the goals set by the student, and the inner norm either gets reinforced or gets an incentive for change.

In the assessment of L2, students are given tasks that they are invited to accept as their own with all the motivational, goal related, and ability conditions (or beliefs thereof) attached, and the processes of L2 are set in motion in this acceptance. Irrespective of the knowledge or skill level of the student, the acceptance of the task (or the refusing of it) activates processes that either enhance or hinder flexible intellectual work necessary for learning a new thing. However, with the noncurricular nature of the L2 tasks as compared to regular curricular assessment, it is easier to see the task itself as instigating and summoning up the appropriate skills and abilities in the student, anticipating his/her willingness for lifelong learning.

As a summary, L2 could be defined as the learning set of the prepared mind to adapt to novel tasks in new and surprising circumstances and, often, within constraints which mean a high mental load.

### Variation and Individual Differences

Cronbach and Snow (1977) address the issue of individual differences. They point out that the L2 generalization is

practically significant only if individual differences in learning are fairly consistent. If individual differences prove to be stable and predictable, one can capitalize on findings from the assessment in which learning is observed only for a short time, perhaps on just one task or topic. If individual differences are radically altered during learning-set formation, the short-term experiments on ATI will not give practically useful conclusion. That also implies that L2 studies would not give added value to other types of studies in learning and teaching.

Between-student differences in any cognitive and educational measure are large and significant for teaching. This is also true for L2 measures, both in cognitive and in belief factors. This outcome arouses some ideological discussions, even to the extent of creating debate of the validity of a measure which shows the L2-scores correlating with school achievement. Some of L2-discussants would like to have a measure that would show a compensatory outcome saving those pupils who do not do so well in formal education. The hoped-for L2 measures as saving virtues should show both zero or even negative correlations with school achievement and positive correlations with some later criterion measure, which also correlates positively with school marks, and, say, Organization of Economic Cooperation and Development (OECD)'s Programme for International Student Assessment (PISA) measures. However, without variations in scores, one cannot do meaningful empirical studies and describe education, and, without a good description, no modeling (theory formation) is possible when planning for a new school for all – where everybody would be better able to learn the modern contents.

When the L2 is understood from the psychological point-of-view – that is, to include studies and theories of learning – then it is useful to analyze the relation of L2 to learning ability, and, accordingly to general cognitive ability. This generalized L2 expresses itself, for example, in the developmentally most important change, when a child who has been learning-to-read moves into the mode of reading-to-learn.

### Collectively Weaved Definition: Social Practice Creating Meaning

There is a relatively new phenomenon where international political institutions (United Nations (UN), United Nations Educational, Scientific, and Cultural Organization (UNESCO), OECD, and European Union (EU)) define educational terms. This process is an example of measures and activities, which create new social practices. These definitions are constructed as a response to attempts to try to achieve compromises, using methods such as the EU's open method of coordination. This process can be described as collective and institutional weaving – where participating countries try to defend their options for a leading position and, possibly, money and various experts

defend their academic fields. An example is the frameworks of OECD's PISA program. Similarly, the EU has worked on a framework for key or basic competencies, of which L2 is one. The following political or working definition is given in the EU documents.

'Learning to learn' is the ability to pursue and persist in learning, to organise 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. This competence means gaining, processing and assimilating new knowledge and skill as well as seeking and making use of guidance. 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. Motivation and confidence are crucial to an individual's competence. (paragraph 5, annex, [Education Council, 2006](#))

This definition is a compromise of educational experts and policy advisors from EU countries, and is, therefore, creating new social practices when countries and schools are looking for resources and sources of innovation. In this sense, the EU definition is weaved collectively to provide a politically convenient definition upon which to also base decisions concerning money and joint actions.

### Examples of L2 projects

L2 assessments in educational settings seem to be targeted to studies on how to learn in educational settings, learning how to learn, or to studies on the outcomes of processes intended to form L2 competencies, learning to learn or learned to learn. *The Curriculum Journal* has devoted a special issue for L2 (2007, volume 18, number 2).

### Studies of Learning Low to Learn

Learning How to Learn – in classrooms, schools and networks is a part of Teaching and Learning Research Programme in UK ([Black et al., 2006](#); [James et al., 2006](#)) The project worked with teachers, schools, and networks of teachers and schools in order to learn the actual practices of promoting how to learn. One of the frameworks has been Assessment for Learning (AfL). Studies were also conducted to understand conditions for school improvement and innovation. There are, in the literature, other good examples of careful studies of life in classrooms, and of practices expected to support the making of prepared minds.

In these studies, the researchers are taking part in life in classrooms observing, video recording, and interviewing teachers and students. In addition, questionnaires are used. Often, the programs produce www-newsletters and other support for discussion, debate, and innovations. The

approach could be called collaborative research and development. This kind of research can be placed also under the tradition of social and educational practices. There are also other L2 projects under the name learning to learn in schools in the United Kingdom (University of Durham, Steven Higgins), as well as in Italy (Christina Stringher) and in adult education in several European countries.

### The Already Achieved Level of L2: EU L2-Pilot

An attempt to combine the cognitive and the affective approach to L2 is the EU prepilot (Frefriksson and Hoskins, 2007), where a combination of the Finnish definition of L2 as the commitment (ability and willingness) to adapt to novel tasks, activating one's mastery of thinking and the perspective of hope by means of maintaining one's cognitive and affective self-regulation in-and-of learning action, and British scales, Dutch scales, and Spanish metacognition scales has been prepared and tested in seven countries (Kupiainen *et al.*, 2008). It is expected that this attempt will lead to further studies and empirical reports.

Instruments are paper-and-pencil tests and questionnaires, which comprise three dimensions – the cognitive, the affective, and the metacognitive. The cognitive is divided into identifying a proposition, using rules, testing rules and propositions, and using mental tools. The affective dimension is divided into learning motivation, learning strategies and orientation toward change, academic self-concept and self-esteem, and learning environment. The metacognitive is divided into metacognitive monitoring, accuracy, and confidence. The test is given in two booklets and the testing time has been two lessons (45 min).

### Transfer as an evidence for L2

Transfer is one kind of evidence for good learning – and is very relevant for L2 studies. Transfer refers to those processes which should be improved if one has learned to learn. A person is showing his/her L2 competencies when he/she faces unexpected chance encounters, can reflect upon his/her own situation, and can adapt him/herself to possibilities and options in the task situation in order to start to learn new requirements.

Speelman and Kirsner (2005) aim to generalize transfer and learning studies into a coherent framework. According to them, transfer reflects the way in which a person adapts to a task situation. In an efficient adaptation to a task environment, people will learn to cope with a task or lesson variation, and to do so efficiently they, say, will rely on the abstraction of features that are common to many items – that is, people will acquire skills that represent their adaptation to the environment in which they are performing at present.

Schooling can be conceptualized in many ways but, in connection to L2, it is possible to say that one of the major

objective tasks of schooling is to arrange teaching and training to adapt to student variation by organizing education in schools and, within schools, in classes. The curricula determine – in their nationally specific ways – the lessons, tasks, and textbooks to provide suitable variation of instructional tasks for ensuring as general a transfer as possible. However, in this process, schooling is determined and limited to take into account student variation. These variations can be analyzed in terms of plastic general abilities or in terms of mastery of L2 cognitive competencies. It is not a question of given, unchangeable, or nonmalleable intelligence, but more of the ways through which pupils adapt themselves in the learning–development transitions at school, and of how former pupils as adult persons have learnt to cope with unanticipated task and environment variation. This learning is also a process of the growth of self-awareness in the pedagogical and intentional relation between teachers and pupils.

### So What?

L2 assessment attempts to measure nonspecific outcomes of learning using tasks which are both taught in principle (as required by the curricula) and new in some (surprising) sense. Irrespective of the practical assessment solution, the whole assessment is for learning (Black *et al.*, 2006), and should guide innovation of schooling.

L2 assessments in their two major forms – learning how to learn and learned to learn – are both needed in a comprehensive system for assessment for learning. The observations and real-time interviews provide information of the ongoing processes of the lessons in a school, and the measurement and description of variations and their different contextual factors provide information about the school as an institution; both of these require communication. It appears that this communicative act can take place in three instances. L2 assessment outcomes inform (1) teachers about their success in communicating during and through lessons how failures and errors are treated post-failure, reflectively – that is, it is how pupils learn that errors and failures can be of use in the process of learning; (2) how teachers have succeeded in telling the criteria of records and markings which are delivered to pupils at the ends of terminus – that is, how well the seriousness of schooling has been understood; and (3) how accurately the school as a whole has understood tasks and goals of education, as a mediator of precious knowledge of past generations to the next new generation.

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## Further Reading

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## Relevant Websites

- <http://www.learn2learn.ac.uk> – Learning how to Learn: A Project of the ESRC Teaching and Learning Research Programme.
- <http://www.learning2learn.eu> – Learning to Learn (L2L).