Chapter 7

The Nature of Learning principles revisited

The innovative cases amply confirm what research tells us makes for effective, powerful learning and what in practice the learning principles actually mean. This chapter shows how the Innovative Learning Environments (ILE) case studies: 1) make learning central, encourage engagement, where learners come to understand themselves as learners; 2) ensure that learning is social and often collaborative; 3) are highly attuned to learners' motivations and the importance of emotions; 4) are acutely sensitive to individual differences including in prior knowledge; 5) are demanding for each learner but without excessive overload; 6) use assessments consistent with its aims, with emphasis on formative feedback; and 7) promote horizontal connectedness across activities and subjects, in and out of school.

Naturally, they are not realised everywhere in the same way and need to be interpreted in relation to their local context. Many of the practices address several principles at the same time.

Introduction

With the conviction that learning research can and should be used to inform educational policy and practice, the "Innovative Learning Environments" project produced *The Nature of Learning: Using Research to Inspire Practice* (2010). Leading educational researchers and learning specialists were invited to review relevant research findings on how people learn and to present these findings in an understandable and accessible way. It concludes with a synthesis of the main findings, drawing all into seven key transversal "principles" which can guide the design of learning environments for the 21st century.

The Nature of Learning is – by the nature of the enterprise – theoretical and relatively abstract. This chapter goes one step further by examining what the principles mean for learning organisations, students and teachers in practice. The principles seek to sum up the rich vein of knowledge provided in the individual chapters in *The Nature of Learning* in a holistic and accessible way; the cases collected in this project provide a rich database for bringing these principles to life.

Figure 7.1. **The ILE learning principles should be at the core of the learning environment**
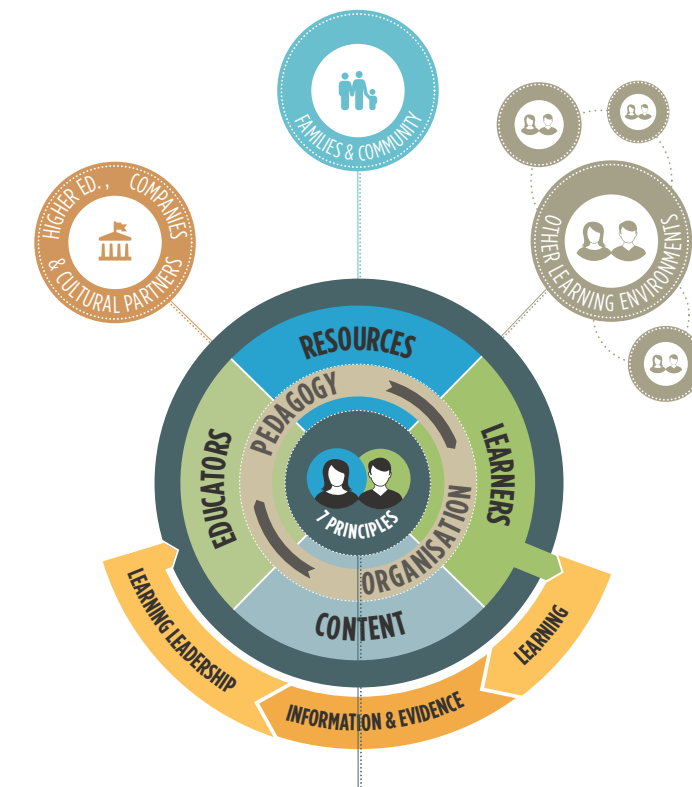
The ILE learning principles

- Make learning and learner engagement central
- Ensure that learning is social and often collaborative
- Be highly attuned to learners' motivations and emotions
- Be acutely sensitive to individual differences including in prior knowledge
- Be demanding for each learner but without excessive overload
- Assessment is critical, but must underpin learning aims & strong emphasis on formative feedback
- Promote "horizontal connectedness" across activities & subjects, in & out of school

There is another purpose to the chapter. The principles represent a framework of criteria to test whether any particular learning environment is being developed in accordance with the lessons of learning research. The case study learning environments, in the manifold ways described in this chapter, fit these criteria very well. As the principles are focused deliberately on the nature of learning, they become manifest in the pedagogical core i.e. in the ways that learners, teachers, content and resources are brought together in different teaching and learning activities using a variety of organisational, pedagogical and evaluative approaches. However, the ways in which those principles get shaped and influenced are equally through the processes of learning leadership, design and formative redesign and by extending boundaries to wider partnerships. Hence, *The Nature of Learning* principles are at once a manifestation and result of the practices described in this volume and a framework of evaluation.

Learner centredness

> **The learning environment recognises the learners as its core participants, encourages their active engagement, and develops in them an understanding of their own activity as learners**

This principle reflects the understanding that knowledge is not just passively absorbed but actively constructed by the learner. A learning environment must actively engage all students in the learning process and make them "self-regulated learners", meaning that they develop an understanding of their own activity as learners. They should be able to monitor, evaluate and optimise their own learning and regulate their emotions and motivations accordingly.

Learning a central organisational priority

In the first place, this principle is met when "learner centredness" defines organisational priorities.

> At *Yuille Park P-8 Community College (Victoria, Australia),* educators, parents and other adult community members work together to achieve generational change for their children. Every aspect of the physical buildings, school operations and curriculum has been carefully designed to enable the motto, "Living to learn, learning to live", to become a reality for each student at the school.

> The constitution of *Colegio Karol Cardenal de Cracovia (Chile)* started in 1997 and establishes school government for the boys and girls. Article 1 of the Constitution states: "Children are the main actors of the teaching and learning process".

> The main focus of *Jenaplan-Schule, Jena (Thuringia, Germany)* is that the students learn how to learn – this within the framework of mastering learning content. The underlying idea is that everyone involved should be responsible for successful learning – the learners are to be activated through direct feed-back in ways that contribute to formative learning.

> When the administration has to select a new teacher, one very important aspect to consider is the degree of commitment: "If a teacher says that it is not his fault that students don't learn, we know he is not good for us. We have the main

responsibility for the learning of children inside the classroom." (Head of Studies, *Instituto Agrícola Pascual Baburizza, Chile*)

The assistant principal summarises the approach of *Courtenay Gardens Primary School (Victoria, Australia)* to mean that "nothing happens here accidentally. Everything is planned because at the end of the day, it is all about improving student learning".

One teacher's comment reflects the overall benefits of the innovative approaches and personalisation of the *Australian Science and Mathematics School (South Australia, Australia)*:

> The emphasis is on the learning rather than the teaching. ... Our learning theory is focused on inquiry ... We have to change the way that we work ... personalisation: I think that that is really fundamental to what we try to do here ... We try to look at the curriculum from the learner point of view and support them. There's a whole lot of flexible ways of working. ... We work in small groups, one to one, classes work together ... flexible ways of working. ... Pre-programmed materials can be put on the portal.

It is a goal for *Valby Oppvenkstsenter (Norway)* that the pupils have the identity of learners. The ideal is the Learning Sun, which is surrounded by and contains emotions (følelse), faith (tro), knowledge (kunnskap), and will (vilje).

Figure 7.2. **Valby Oppvenkstsenter philosophy – the "Learning Sun"**

Source: OECD (2012). Inventory case study "Valby early development centre and primary school Larvik – an active learning approach", www.oecd.org/edu/ceri/49945416.pdf (accessed 11 July 2013).

The Valby objectives can be summarised in six key points:

1. The pedagogical basis should be adaptability – not teaching.

2. The potential of the child should be the basis for teaching.

3. Children should learn from children.

4. Teachers should work as a team.

5. Diversity should be exploited as a resource.

6. Systematic collective reflection should form the basis for shared practice.

The metaphors and language in use can be deliberately chosen to underline and reinforce organisational priorities – in this case, that learning is at the core of the organisation's business and objectives.

> The metaphors in use by *NETschool (Victoria, Australia)* staff imply an alternative approach to teaching, learning and assessment, one in which the learner is central to the educational practices.

> In order to be able to name the many new structures, processes and tools which have learning itself at the core, the *Institut Beatenberg (Bern, Switzerland)* has created a large number of new terms or uses existing terms with a particular meaning. Several of these terms have in whole or in part been taken over from English – sometimes resulting in pseudo-English terms – in order to contribute to an atmosphere that differs from the association with traditional schools.

Table 7.1. **Glossary of the specific Institut Beatenberg terminology**

Original term	English translation
Agenda	*Agenda*
Aktiv	*Aktiv*
Baumarkt	building supplies store
Checkliste	checklist
Sammelportfolio	collection portfolio
Feedbackgespräch	end-of-term interview
Go4it	*Go4it*
Wochenschwerpunkt	key topic of the week
Layout	*Layout*
Lerncoach	learning coach
Fachcoach	learning coaches who are in charge of a subject setting
Lernportfolio	learning portfolio
Lernjob	learning task
Lernteam	learning team
Standortgespräch	parent-and-pupil interview
Bezugscoach	personal coach
Selbstkompetenz	personal skills
Werkschau	presentation of the pupils' work
Präsentationsportfolio	presentation portfolio
Lernnachweis	proof of learning
Kompetenzkompass	skills compass
Kompetenzraster	skills matrix
Smarty	*Smarty*
Fachsetting	subject setting
Trimesterbeurteilung	term report
Unit	*Unit*
Bilanzgespräch	weekly appraisal interview

Source: OECD (2012) Inventory case study "The Beatenberg Institute", www.oecd.org/edu/ceri/49930760.pdf (accessed 1 July2013).

Putting learning at the centre may *inter alia* mean to aim consciously to reduce the gap between the teacher and the learner:

> At *Makor Chaim (Life source) (Israel)*, and following the Torah principle "Do not teach what you know, teach what you wish to learn", teachers study subjects together with their students, eliminating the dichotomy between the teacher who knows and the student who does not know, "turning both of them into those who do not know and therefore wish to study together".

Learner engagement

The second key aspect of the "learning centredness" principle is *engagement*. If the learners are not engaged, their possibilities for learning are substantially reduced. This is about both individual engagement and the equity objective of engaging all learners in the environment. Earlier chapters have already illustrated how enhanced engagement underpins the adoption of such approaches as learning with technology and working with projects, when these are well done. For some of the case study learning environments, indeed, combatting disengagement has been their essential purpose:

> *NETschool (Victoria, Australia)* was founded in order to re-engage young people (aged 15-20) in work or study. It offers a highly innovative environment designed to provide positive learning experiences for "at risk" students.

> Ten years ago, before the teaching team committed itself to the transformation of *CEIP Andalucía, Seville (Spain)* some of the defining characteristics were lack of student motivation and interest, distrust in teachers, lack of school habits and of expectations for their future, high absenteeism, and poor academic results.

In other cases, enhancing engagement is a high priority among others, and an important indication of success.

> The goal of *Mevo'ot HaNegev (Israel)*, which was developed gradually, has been to increase the *engagement of both teachers and learners in educational performance* as they shift from dealing with teaching to focussing on learning in addressing cognitive learning (knowledge), meta-cognitive learning (understanding how to learn and how we acquire information), and social and emotional development (the entire area of personal and interpersonal communication). Ever since shifting to this model of learning and assessment, students have been perceived as more active and independent: students have to solve problems and direct their own learning; they are curious and enthusiastic learners who are involved and having fun. "It interests them. They do things with care and passion" (teacher).

> The *Centre for Studies on Design at Monterrey (CEDIM) (Nuevo León, Mexico)*, engages the students participating in it by interchanging ideas, expectations, goals and objectives; it focuses on project achievement which satisfies the needs and interests of the enterprises or institutions asking for it but also those of students who make those projects theirs. Both the students and executives expressed how important is the motivation generated from these projects.

> The students at *Community Learning Campus (CLC), Olds High School (Alberta, Canada)* are participating in a national student engagement study called *Tell Them From Me?* Teachers and administrators are particularly interested in increasing student intellectual engagement.

The whole idea with the innovation at *Breidablikk School (Norway)* was based on the focus on motivation, as written up by one of the teachers in an article on Interest-based choices for increased motivation: "The basic idea was that the pupils would learn more if they were allowed to meet the curriculum via their own interest fields. ... At this age, the pupils are in a formative phase, so motivation for the school work may as well be about access to challenges for building attractive identities in their everyday school practice." In that perspective, the different tracks offered will give the pupils opportunities to develop their different pupil styles to include success at school.

The learners at the *Saturna Ecological Education Centre (British Columbia, Canada)* said that all their assessments were about how each of them is improving, that it is personalised because it's "from where you are to where you're going, and I love that, it's very motivating".

At *Colegio Karol Cardenal de Cracovia (Chile)*, the aim is to provide a different type of education to students and this is reflected in the different workshops and activities. For example, they have a workshop on circus-theatre, where children are taught to develop self-consciousness, they have games, juggling lessons, karate workshop, music workshop and the most important workshop is school government.

Skilled at self-regulation

The principle's third element is that the learning environment "develops in them an understanding of their own activity as learners". The learners become able to undertake the planning, organising and monitoring of their own learning; they are encouraged to develop their own learning goals and learn how to evaluate what they have already accomplished and what still needs to be done.

In the *Lobdeburgschule (Thuringia, Germany)*, an approach was developed to gradually build the self-regulation of students. From the 5th grade, learners are systematically trained in a range of methodological competencies, taking on more complex competencies as they progress. For example, a 5th grade learner is trained in the "5-step reading method", and a later learner is trained in higher-order competencies like "interpreting texts" (grade 8) and "arguing" (grade 9). Lobdeburg is characterised through efforts to strengthen personal responsibility and independence with acceptance and support of each person corresponding to their individuality.

The *Institut Beatenberg (Bern, Switzerland)* relies on self-regulation to a degree not usually seen in primary and secondary education. The learners assume complete responsibility for their own learning, aided by an extensive range of cognitive and meta-cognitive tools and regular interviews with their personal coach. The importance assigned to "learning to learn" is demonstrated in that a specific skills matrix has been created for learning skills. Independence and assuming responsibility for one's own learning apply not only to the accomplishment of a single learning task but are relevant to the learners' inclusion in the planning of their education (parent-and-pupil interview) and in the definition of the goals for the term, i.e. when they choose from the range of offers in the optional settings. The concept of self-directed learning becomes most visible in the "learning team".

The *Australian Science and Mathematics School (South Australia, Australia)* educational philosophy is focused on personalisation and independent learning, as

evident in the published learner expectations such as: understanding themselves as learners and sharing learning with others; being autonomous and self-directing; valuing the beliefs of others and working in groups and independently; using their own experiences to construct and add meaning; identifying and critically evaluating resources and creating meaningful learning products for real world situations and audiences. A range of strategies is used to personalise the curriculum and to support self-directed learning such as the Personal Learning Plan, opportunities for negotiation within topics, assessment choices and materials being available on the online portal.

Each morning at *ImPULS-Schule (Thuringia, Germany),* the checklists are discussed in a chair circle and afterwards the pupils choose their topics according to their own interests and needs. The self-regulation process is monitored by checklists and self-tests. Using individual learning diaries and supported by teachers, students plan their daily and weekly learning aims at the beginning of each day for about 15 minutes. As part of this routine, they also reflect about what they have learned the day before. At the end of each week, the whole learning progress of the week is reflected and the next week is planned. Each time, at the end of the 80-minute units, the pupils reflect and discuss the completed topics, the used methods, and their individual success sitting with other pupils in chair circles.

At *Mevo'ot HaNegev (Israel)*, meta-cognitive learning is a priority, in order to increase learners' awareness of the values that lie behind their actions as well as of the way they learn, and to increase their engagement and responsibility for learning, all this using a project-based learning strategy.

Observed classes in *Dobbantó (Springboard) (Hungary)* differ from regular classes mostly in that students are much more active. Lectures by teachers are very rare; students work individually or in small groups very often. As traditional textbooks are not used, the study material is basically selected by the students (following the teacher's detailed instructions).

The case study learning environments that have most explicitly the objective of developing regulation in learners do not under-estimate how demanding this can be for novices who are not used to it.

According to the learning coaches at the *Institut Beatenberg (Bern, Switzerland)*, the pupils have only little experience with this kind of learning when they enter. The learning teams offer excellent conditions for the development of the learning skills due to the intensive support provided by several learning coaches and the clear structuring of each week with five learning tasks, the weekly appraisal interview and the weekly presentation of the pupils' work.

The learner groups at *Jenaplan-Schule (Thuringia, Germany)* are structured into three-year age groups (the sub-group, middle-group and upper-group). The sub-group is introduced to the weekly plan work and later on to the project work. The acquisition of self-regulation strategies for the individual learning process is the main focus.

Pupils take responsibility for their own learning process at the *ImPULS-Schule (Thuringia, Germany)*. A problem of the co-operative learning environments is that the usage is hard to learn and there is a lot of prearrangement. Therefore, the pupils get specific learning strategy trainings and the learning materials for each topic are well prepared.

The social nature of learning

> **The learning environment is founded on the social nature of learning and actively encourages well-organised co-operative learning.**

"Effective learning is not purely a solo activity but essentially a distributed one" (Dumont et al., 2010: 52). However valuable that self-study and personal discovery clearly are, learning depends on interacting with others. There are robust measured effects of co-operative forms of learning when it is done properly. The ability to co-operate and learn together should be fostered as a 21st century competence, quite apart from its demonstrated impact on measured learning outcomes. Chapter 3 referred to how learners may often teach their peers, and Chapter 4 illustrated how skilled the learning environments can be in using different ways of grouping the learners to enhance their learning, including mixed-aged groupings. All of this is about optimising the social nature of learning, reinforced by the examples presented below.

Recognising the social nature of learning

For certain of the learning environments, the social nature of learning is a central defining feature of their approach and organisational culture.

> Central to the philosophy of the *Community of Learners Network (British Columbia, Canada)* is the motto "We are all learners; we are all teachers". Talk – in partners, in circle meetings, in peer conferencing sessions and elbow to elbow coaching sessions – is essential to the building of community and the construction of knowledge. The fact that the learning of every learner is the responsibility of the community creates commitment to collaborative learning.

> In the group interview, the seventh to ninth graders in *One-room School, Gesamtschule Lindental (Switzerland)* name the co-operation among the pupils as the most characteristic element of their one-room school.

> The *REOSCH (Bern, Switzerland)* diploma was developed in order to lend more weight to the development of personal and social skills. There are three consecutive levels the young people can reach, moving from personal skills to social skills and explicitly rewarding shown capacity to work with others:

> - *Diploma level 1*: The pupil strives to improve his or her perception, concentration, endurance, imagination, health awareness and ability to work under pressure, and these efforts have already met with success.

> - *Diploma level 2*: The pupil is able to adjust to a group and is aware of the importance of this ability. The pupil keeps working on his or her ability to perceive others, to respond positively to criticism, to cope with emotions, and is willing to overcome resistances.

> - *Diploma level 3:* The pupil considers himself or herself as an active participant in the group. (S)he is able to inspire and guide the group and has negotiating skills. Active participation in the two-week trekking trip is a prerequisite for achievement of the third diploma (at the end of grade 9 or 10).

> As the majority of children and young people are isolated from peers even within the hospital during their stay, the access and availability of ICT to facilitate social

connection and limit social isolation is hugely important for the on-going healthy development and well-being of these children. Strong connections between the *Royal Children's Hospital (Australia)* and external partners have been established to investigate, amongst other things, the use of different technologies for keeping young people engaged with learning and connected with their peers and school communities while in hospital.

Sometimes, the social nature of learning is so explicitly recognised that occasions are scheduled to raise and discuss interpersonal issues.

At the *One-room School, Gesamtschule Lindental (Switzerland)*, a weekly class meeting is held every Friday where learners reconcile their differences, agree on social rules within the class, and express thanks to each other. In accordance with deliberately fostering social skills and competencies, oftentimes, students are also given corresponding feedback.

Students at the *Jenaplan-Schule (Thuringia, Germany)* meet every Monday morning to discuss intergroup problems and conflicts and talk about the social climate of their learning group.

The first and last weeks of the academic year in the *Dobbantó (Springboard) (Hungary)* do not follow the normal template. The first week is devoted to getting to know each other and making plans, and the academic year is closed by a week of feedback and looking into the future.

Co-operative learning

As discussed by Slavin in his contribution to *The Nature of Learning* (2010), co-operative approaches still remain on the margins of much school activity, despite very longstanding understanding of its benefits and an almost equally longstanding accumulation of evidence to support its value. In too many systems, the culture of working by oneself remains deeply entrenched. He also argues on the basis of the evidence that group-work needs to be much more thoughtful and designed to enable learning than simply letting young people talk and share tasks. The case study learning environments illustrate well these points.

Lok Sin Tong Leung Wong Wai Fong Memorial School (Hong Kong, China) has restructured all classes in primary 1-6, divided students into small groups normally with 3 to 4 group mates. Each group is made up of some more able and some less able students. The heterogeneity of the groups enhances co-operative learning in which students work together to maximise their own and each other's learning.

In the *Community of Learners Network (British Columbia, Canada)* circle discussions are referred to as Literature Circles, Information Circles and Numeracy Circles, and generally comprise 4-8 students. Students from the various groups gather to share the information they have acquired, with a teacher facilitating the sharing of information, prompting in-depth thinking, offering feedback, and highlighting key elements of the topic under discussion.

At the *Community Learning Campus (CLC), Olds High School (Alberta, Canada)*, different types of groupings are used for different assignments:

Sometimes I'm in a table grouping of four students and sometimes I am in a grouping of just two students and sometimes I choose to work by myself. It's the best, because I can talk with the other students and we

work our way through the project. It really makes me think that two minds are much better than just one because sometimes I just don't know this and your partners know a better way to do it and you end up learning from them. (Student)

We brought all the English students together and gave them a four- or five-page detailed editing sheet of the criteria they were to work with. They had to take someone else's essay before we had our look at it. They went through a peer assessment process with a classmate's essay, providing specific, detailed, helpful feedback to help them improve their essay. They were learning from the mistakes that someone else made, but they were also finding out ways to improve their own writing and thinking. After this, the students worked on their own essays again. They got formative assessment back from their peers and they got to redo it, bring it back to us and then of course we graded it, but then we also provided the students with more feedback. (Two teachers)

Project work in *Mevo'ot HaNegev (Israel)* reinforces collaboration and the learners reported many benefits: the material is more accessible, deliberations with friends make the discussions more interesting, each one can help the other and the personal work load is smaller. The advantage is most significant in complex and large assignments where, as stated by one learner: "there is a lot to write, lots of work to find materials, so it's easier when two persons do it and you are not left with the entire load". Applying understanding reinforces additional skills as the learners are required to present their products in a variety of ways, including posters; presentations in front of parents, students, teachers and experts; and other aids.

In the *Europaschule Linz (Austria)* the lessons are designed to encourage and allow pupils to assume a high level of responsibility both for their own and for their classmates' learning processes. For example, in a class divided into two groups there was a deliberate information gap, which the pupils then had to bridge by explaining the subject matter to each other. They took this task seriously and really tried to make each other understand. Learning by teaching means not only taking on the role of teacher, but also assuming the latter's responsibility.

Once external partners have designated which of the proposed projects are to be developed by a student group, the steps followed by *CEDIM (Nuevo León, Mexico),* are:

- *Presentation of project to be developed:* once the case is presented, students must have clear specifications of the project, of the problem, of project characteristics and of its purpose itself.

- *Problem definition:* students must have defined the problem to be resolved, and in this way, to become an agreed 4-month project.

- *Brainstorm:* once the problem is identified, the group is organised in teams so as to achieve agreements about what it is needed to know so as to find its solution and to develop the project.

- *Classification of ideas:* after the brainstorm, such ideas must be classified and prioritised to define the fundamental ideas to address the problem.

- *Formulation of learning objectives:* students and the teacher together determine learning objectives, based on project characteristics.

- *Research:* research is used from different sources to make a comprehensive survey around the problem, extract key concepts and main ideas, and finally, to collected material; on the basis of all this students create an action plan.

- *Group organisation to develop the project:* students are organised to develop the project to an agreed schedule, guided by a teacher.

- *Presentation and results discussion:* students present their projects to the teachers and apply different types of evaluation from them: self-evaluation, evaluation and co-evaluation. Enterprises and public or private institutions attend presentations and evaluate them as well.

Often, these forms of co-operative learning are supported by communication technologies which provide helpful tools for student interactions, such as discussion boards, blogs, forums, chat-rooms and messaging.

Activities in e-classrooms (chat rooms, forums, individual messages) enable good interaction among pupils and between pupils and teachers not only in the area of knowledge, but also in social, pedagogical, and psychological areas, which contribute in important ways to the development of whole personality. "What I like the most is simple use of e-classrooms, the opportunity to do tests, and communicate with the people who are in the e-classroom at the same time." (Student at *Internet Classroom, Kkofja Loka Primary School, Slovenia*)

Such a virtual learning environment called Link is one of the main outcomes of *Liikkeelle! (On the Move!) (Finland)*, a forum for social networking among students, teachers, and various kinds of experts in which users can publish blogs, establish working or friendship groups, share files, pictures and movies, engage in discussions, and send messages to each other.

An example of both authentic and collaborative learning within the *Royal Children's Hospital,(Australia)* is the "Trans-Tasman Project" where students from different age groups across the hospital worked together to gain an understanding of how the Christchurch (New Zealand) earthquake affected the young people there. Assisted by the teachers, they connected with a school in Christchurch, and created a blog to facilitate input, voice and decision-making about the project with the aim of raising funds through the development and selling of wrist bands. Students of diverse profiles and across different wards of the hospital combined to participate in this student-led, inquiry-based collaborative project. Hospital-wide communication between the young people occurred via various mechanisms including face-to-face meetings in the hospital, via the blog and using an iPad walkie-talkie application between hospital floors and wards.

As with the example of regulation discussed under the first principle, habits of co-operation do not always come naturally especially in educational cultures steeped in individual work directed by the teacher. The *Itinerant Pedagogical Advisor (API) (Conafe, Mexico)* in the following example finds he needs to work at overcoming this entrenched culture to get the students to collaborate.

Working in a multilevel environment is usually an advantage for the advisor because collaboration amongst students is continuously taking place. In this particular school, Ramiro is focussing on boosting co-operation between classmates, because

kids were under the impression that helping another student meant doing all the work for them instead of guiding them; he is working on making them comprehend that helping a classmate means explaining to them, providing them with hints that allow them to figure out their own conclusions. He is guiding the tutoring and reinforcing that students from the upper levels coach students from the lower ones. (Itinerant Pedagogical Advisor)

The examples confirm the value of co-operative learning and the need for this to be done in designed, deliberate ways: learning and working together is commonplace among the cases, and tends to be done consciously using a range of approaches to enhance the learning.

Responsiveness to motivations and emotions

> **The learning professionals within the learning environment are highly attuned to the learners' motivations and the key role of emotions in achievement.**

The cognitive, emotional and motivational dimensions of learning are inextricably entwined (Boekaerts, 2010). Learning cannot – and should not – be understood as a purely cognitive activity: teachers need to be aware of and responsive to students' emotions and motivations in order for successful learning to happen. Research and everyday practice underscore how students are more motivated to work hard and engage in learning when the content is meaningful and interesting to them. They need to feel competent to do what is expected of them and learn better when they experience positive emotions. Learners need to become attuned to their own emotions and motivation if they are to become self-regulated learners.

By placing students at the centre of learning, their interests and needs are naturally recognised. Developing positive attitudes to learning may be built into the explicit aims of teaching and feedback or it may take the form of offering electives and extra-curricular activities that meet learner interests. The innovative learning environments make students feel confident about their skills and abilities by concentrating on qualities and resources of each student rather than inordinate focus on deficits and weaknesses.

Learners have feelings – recognising the importance of motivation and emotions

Recognition of the importance of emotions is in part to share an understanding throughout the learning environment of learners as whole people – replete with emotions and feelings – rather than more partial mechanical assumptions about learners and their learning.

> A central aim of the *Institut Beatenberg (Bern, Switzerland)* is to enable the pupils to experience a feeling of success, i.e. a sense of achievement. Success is made visible, it is an explicit topic in the weekly appraisal interviews and in the parent-and-pupil interview; the definition of learning goals are tailored to each individual pupil's capability and the regular provision of individual feedback seeks to ensure that each and every pupil meets with success. Each student can choose his or her "key topic of the week". This can be either a topic of personal interest to the student, or one aimed at filling a student's knowledge gap, or one relating to other parts of the current curriculum.

At the *Instituto Escuela Jacint Verdaguer (Spain)*, students can engage in several activities such in the fields of theatre, sports, music and art, with the aim to encourage them to express themselves and develop self-confidence.

Students are placed "at the centre of learning by finding out first what their passions, interests and needs are" as stated by the *Discovery 1 and Unlimited Paenga Tawhiti, Christchurch (New Zealand)*.

In *Miwon Elementary School (Korea)*, story-telling, the singing of children's songs, acting in plays, and a musical produced in a foreign language all effectively raised the pride of the students and parents from both foreign and Korean families.

At the *Jenaplan-Schule (Thuringia, Germany)*, for instance, the act of celebration has even been institutionalised. Every Friday at noon, the week's learning results are celebrated with the whole school.

CENDI (Nuevo León, Mexico) is creating in children a conscious stage that progresses, extends and reinforces their collaborative learning through community involvement. This means to address doubts, concerns, and questions they have to differing degrees of their intellectual and physical development as part of the educational process. This creates a participative, warm and secure environment, while avoiding the fears, insecurity or boredom they often experience in a traditional education setting. They facilitate the creation of interest, empathy and support among the children, and develop and stabilise emotional intelligence.

Particular emotional needs may be linked to the age and maturity of the learners. This is referred to by a couple of the case study learning environments, and how they have responded to these particular needs.

Children who complete primary education around age 12 start the new cycle in learning environments whose organisation, teaching methodologies, etc. is unfamiliar to them. This requires a period of adaptation and some students end up losing their motivation. This does not occur in the *Instituto Escuela Jacint Verdaguer (Spain)* since having become an integrated school as the same teaching approach and methodology are used, the two principals and the teachers of both stages talk and work together, quite apart from the physical connection between the two buildings.

Adolescents account for 15% of all hospital admissions to the *Royal Children's Hospital Education Institute (Australia)*. A needs analysis and consultation identified the necessity to address the diverse educational and specific developmental needs of adolescents. This resulted in an evidence-based adolescent learning environment within the Royal Children's Hospital designed to support varied learning modes. As social and emotional interaction is particularly important during the adolescent years with identity, psycho-social development, and emotional maturation being critical factors at this age, a diverse learning space has been created including individual and group-discussion spaces, retreat areas, information centres, lounge and recreation spaces and storage spaces.

Bonds of attachment and trust

The learning communities and the teachers and tutors within them can become strong sources of attachment, hopefully in healthy ways so that learners are also able to develop autonomy and self-sufficiency rather than dependency.

The *Community of Learners Network (British Columbia, Canada)* encompasses many aspects of social and interpersonal development as educators seek to create a deep sense of attachment to the learning community through a focus on belonging, support, interdependence and respect for diversity. Students are immersed in an environment that offers a balance of structure and autonomy so that they experience a combination of safety and accountability as they take risks in their own learning.

At *Europäische Volksschule Dr. Leopold Zechner (Austria),* students tend to establish strong bonds with their teachers. The teacher as an attachment figure is important in a world in which the children experience a wide range of uncertainties. As many of these students live at home immersed in another culture, possibly even speaking a different language, a strong "mothering figure" can enable them to feel at home in the mainstream culture.

The teachers have more time with students in *Dobbantó (Springboard) (Hungary)* each week, getting to know them better, and making it possible for students and teachers to form a bond based on trust. The work of the teacher team may be supported by other specialised staff (e.g. school psychologist, developmental teacher, special education teacher, pedagogical assistant, the person responsible for child protection, social educator, school social worker).

It is recognised in *Instituto Agrícola Pascual Baburizza (Chile)* that many of the learners arrive with emotional weaknesses such that the Institute has been able to adapt a special working method to create some certainty and suitable guidance and support. Each teacher is in charge of 10 students and uses a personalised tutoring method. There is a psychologist who acts as a counsellor, who teaches two workshops every week at 11th and 12th grade with other teachers running the same workshop with levels 9th and 10th. Tutors are teachers who accompany students and are closer to them – there are three of them in the school – though tutoring is a mission shared by all the teachers.

Sustaining motivation is a key issue for these students. The central feature of *NETschool (Victoria, Australia)* mentioned by all interviewees and highlighted in the evaluation is that of relationships based on trust. Said one teacher and mentor: "the relationship you form with these guys is very important ..., you need to be able to have communication with them. They need to be honest with you and you have to be honest with them. So that's very critical". Given the significance of relationships, the school focuses on the close, personal support of mentors with learners, particularly with young mothers, who are perceived as a highly motivated group.

Education of the emotions

Interesting practices are found in the project learning environments to help students become aware of their own emotions and motivations, as a prerequisite to becoming self-regulated learners. Often, though not exclusively, the learners are facing challenging circumstances or behaviours to begin with.

The project *Chiamale Emozioni (Call them emotions) (Ticino, Switzerland)* aims at increasing teachers' expertise in fostering students' socio-emotional competences. In one project activity, learners discover and identify their fundamental emotions – fear, sadness, anger, joy, surprise, disgust and contempt

– and become articulate about them. Particular games and strategies include: Anger Soup and Emotion's Puppet for self-awareness; Sweet Words Relay Race for social awareness; Traffic Light Inside Ourselves for self-control; You Are Special for relationship skills, and The Magic Wand for responsible decision-making.

At the *Zakladni skola Chrudim (Czech Republic)*, students attend a wide range of seminars on social-emotional development, aimed at building a well-functioning team with peers and teachers and for practicing communication and social skills. The focus of the seminars is on mutual knowledge of pupils and teachers, student confidence and knowledge of their individual differences, mutual respect, confidence and responsibility. There is also attention to effective verbal and non-verbal communication; activities include role-plays and relaxation techniques.

In his book, the principal (of *Colegio Karol Cardenal de Cracovia, Chile*) tells how Reiki helps students living domestic violence:

> The first sessions of Reiki, supported by relaxing exercises, aromatherapy and musical therapy, applied to the little boy, and produced important change. Little by little he was learning new techniques that allowed him to better manage his emotions and by doing this he started recognising Karol world as an oasis compared with what he was living at home. He started to love himself and to enjoy the fact of being loved, protected and respected as a child. (Navarrete, 2006: 153)

It is recognised in *Instituto Escuela Jacint Verdaguer (Spain)* that learners need to be able to express themselves by either acting, playing, doing exercise, listening to music, or expressing themselves artistically or creatively. Situations need to be created whereby learners develop self-confidence and self-esteem. One term per year, students do kinesiology activities for 90 minutes per week, and also yoga activities. The aim is to help students concentrate, relax and gain more self-control. From the age of 12, students learn to recognise and to become explicit about their emotions through games.

A key aim for all pupils at *Europaschule Linz (Austria)* is the development of a positive perception of the learning process that will in turn be transferred into a positive attitude to lifelong learning. In this light, considerable importance is given to teaching pupils how to tolerate frustration and deal with failure and disappointment.

At the end of each day, the pupils at *REOSCH (Bern, Switzerland)* take 10 to 15 minutes to reflect on how they felt while they were learning during that day. They should focus not on what they have learnt, but on their emotions while they were learning. They record their observations in a notebook called the "energy diary". Its purpose is to improve the sense of self. As a first step, they try to map their moods and the triggers for these moods. As a second step, they analyse what it takes to improve matters, and only as a third step do they consider concrete ways towards that improvement. It serves as a basis for the weekly coaching interview, i.e. it is only used in a confidential setting in which entries will never have negative consequences for the diarists. Together with the working journal, it provides the basis for planning the following week.

Sensitivity to individual differences

> **The learning environment is acutely sensitive to the individual differences among the learners in it, including their prior knowledge.**

> **The learning environment devises programmes that demand hard work and challenge from all without excessive overload.**

Students differ in a myriad ways regarding their abilities, competencies, motivations and emotions as well as their linguistic, cultural and social background. A big challenge for all learning environments is to be sensitive to these individual differences and understand these diverse backgrounds and starting points that students bring with them. Teachers need to be able to adapt learning activities to these individual differences and preferences. This is particularly true for the differences that exist in the prior knowledge and learning that students bring with them into the learning situation. This closely relates to the next principle on assessment for learning since it is through sensitive assessment that learner strengths and weaknesses can be identified and through which such individual differences are brought into relief. On this basis, teachers can then challenge their students to just above their existing competence level without overloading them – avoiding that anyone is coasting but also that anyone is out of their depth – a prerequisite for successful learning in groups of learners.

Because of the close interaction of these two principles in practice – sensitivity to differences and pushing each learner just up to or beyond their limits – they are taken together for this discussion. This section will focus on some of the general approaches that underpin personalisation in the ILEs as well as some illustrative examples taken from the cases.

Individualised approaches

At the Quality Learning Center and Enquiry Zone in *Mordialloc College (Victoria, Australia)*, students in Grades 7 to 9 spend three-quarters of their school time in "Learning Centres": open and flexible spaces characterised by an individualised learning approach. One teacher described this environment in which students work on different tasks as follows:

> You can walk over and find one student who's working on maths problems, another student will be working on the computer and doing something about Power Point ... some other students will be building something with clay. ... They are not all doing the same thing. And they'll be sitting at the same table talking to each other about the same thing, doing different tasks.

Not all the students were comfortable in the traditional school and the alternative was seen to base the approach on an appeal to pupils' interests in order to improve their disciplinary as well as social development. This was the basis for a new practical pedagogical model at *Breidablikk School (Norway)*. It implied differentiation of how pupils should learn, but not what they should learn. They should all fulfil the objectives of the national curriculum.

Valby Oppvenkstsenter (Norway) aims to make both the children and the teachers grow and is able to summarise its approach as:

- Giving the children an identity as learners and immediate attention and positive feedback, based on actively understanding each child and her or his needs.

- Making the school a learning organisation by systematic and positive feedback to the teachers through a system that promotes assessment for learning, sharing competencies and teaching tools and development ("The Project Companion").

- A three-way conversation bringing together parents, kindergarten and the primary school twice a year, and a new three-way conversation for coherence between the primary and lower secondary schools. In those conversations, the main point is the child's identity as a learner, where knowledge, competencies, values and social skills are analysed around an image of a robust and learning child.

Europaschule Linz (Austria) uses a combination of student-initiated and traditional forms of learning. Open structures are used to foster self-determination and independence. Autonomous, self-determined learning and alternating social modes are seen as a basis for differentiation and individualisation: "[They] are indispensable requirements for the necessary differentiation and individual support of all children". The adoption of flexible roles for teachers and pupils and the use of team-based teaching support a more individual approach which embraces differences in, for instance, ability and learner types.

New learning content is introduced to small groups of pupils (between one and four), typically of only one grade at *One-room School, Gesamtschule Lindental (Switzerland)*. Thanks to the teachers' close relationship to the pupils resulting from years of coaching their learning, they know their individual strengths, weaknesses and knowledge gaps very well. Consequently, the teachers are able to assess which pupils from other grades can profit by joining the present small group, be it because they have to catch up on a topic or because they are advanced enough to relate to what the older pupils are currently dealing with.

At *Dobbantó (Springboard) (Hungary),* the central elements are individual development, differentiation, the central role of assessment supporting development, and giving students the opportunity to take individual responsibilities. Co-operation, learning together and learning from each other are encouraged, and co-operative methods, projects and formative assessment are used.

Because of the particular situation in the hospital with children having to undergo medical procedures or feeling ill, and being each with very different educational histories, teachers have to be constantly responsive to the needs of each child at the *Royal Children's Hospital Education Institute (Australia)*. The aim of the institute is to assist children who are in the hospital to remain or re-engage with their education.

Many students become demotivated if demands are too high for them. If the students' feeling of demotivation and frustration is revealed through the energy diary, the demands may be adjusted so that students are able to cope with them. The teachers' main task at *REOSCH (Bern, Switzerland)* is thus not to motivate the pupils but to see to it that the pupils are not demotivated

because of demands that are too high. The underlying idea is that if high – but not unrealistic – demands are made and the pupils are able to cope with them, intrinsic motivation will develop automatically.

It is not surprising that the individualisation of information, communication, and materials permitted through technology is referred to as an important means through with to realise this principle.

> At the *Australian Science and Mathematics School (South Australia, Australia)*, an online curriculum is available through the school's e-Learning portal in order to enable students to personalise their learning. Students can access learning content from other grades: some students in Grade 10 study at a Grade 11 level and some students from Grade 12 already take first-year courses in mathematics and science subjects at Flinders University.

> The teacher-pupil message exchange in e-classroom enables individual communication of teachers with pupils in the *Internet Classroom, Kkofja Loka Primary School (Slovenia)*. Others in the e-classroom cannot see those exchanges so that the learners can trust matters they otherwise would not reveal. This kind of communication not only contributes to better knowing the children but also strengthens mutual confidence between pupils and teachers, and it encourages their personal responsibility. That is particularly desirable when the teacher gives instruction to a larger number of pupils whom (s)he meets only once or twice per week for regular teaching.

The following two examples are less summaries of practices than reflections by the researcher or the professional on the ways that teaching is adjusted to the different levels and abilities of the learners.

> At the *Europäische Volksschule Dr. Leopold Zechner (Austria)* the assignment to the observed groups was partly done by the teachers, partly by the learners, who asked to be placed in this or that group. Mostly students are habitually in one or the other group according to ability. In observing the groups we could not see a difference in the content of the teaching being "toned down" for the lower ability students. The division seemed mostly to allow teachers to talk to a smaller group, facilitating higher monitoring of all students in each group, and then to support them individually while working through problem sets. In the lower ability group, the teacher did more one-on-one consulting of individual students after the general introduction for all in her group, than in the higher ability group.

> The same activity presented different difficulties to each child and, according to their needs, the API Ramiro *(Itinerant Pedagogical Advisor (API) programme, Conafe, México)* offered suitable guidance and helped them realise they were able to do the work in recognising the different efforts and progress they made. As he articulated it:

>> We try to integrate activities that have different complexity levels; even when it is the same content, we vary the difficulty level and depending on what children know, their abilities, their capacities we guide the activity to what they can solve, to what they can understand. This way we are conscious of their differences, because if we plan the same activity for the three levels with no variations it won't have the same impact since we would put some kids at a disadvantage ... According to the activities planned by the instructor, we think of the strategies and the children that will be tutored.

Learning matrices

Recording individual progress in a formal way, with the active involvement of the learners themselves, permits the information to move from inside the teacher's head to become more visible and useful – to the learner, to the teachers in general, and to others (including parents). Chapter 5 discussed the theme of "information richness" (and of transforming information about learners and learning into usable knowledge).

> At *Mordialloc College (Victoria, Australia)* the individualised learning approach is guided by each student's "learning matrix" – a two-dimensional grid made up of a series of vertical and horizontal axes used to structure the content of learning and capture the student's learning progress. It is based on the "Victorian Essential Learning Standards", which is a set of common state-wide standards that schools use to plan student learning programmes, assess progress and report to parents. The learning matrices, which are kept by students in a learning folder, are used for regular conversations between teachers and students about the learning progress being made. They can also be used for self-assessment purposes by students.

At the *John Monash Science School (Victoria, Australia)* and the *Courtenay Gardens Primary School (Victoria, Australia)* "individual learning plans" are developed for each student which helps students to find their pathway through the range of curriculum offerings.

> Every week the pupils plan and assess their own learning in the *Institut Beatenberg (Bern, Switzerland)* with the help of the Layout, supported if needed by their personal coach. The planning of their key topic of the week is particularly important. They discuss their achievements in the weekly appraisal interview with their personal coach, and together they draw conclusions. The weekly presentation of the pupils' work also helps them to reflect on their learning progress.

> Working with checklists supports individualised learning processes at the *ImPULS-Schule (Thuringia, Germany)*. For orientation and for planning purposes, the requirements are made very transparent.

>> Supported by the checklists, the instructive element of the learning process is getting individualised. Individualising is necessary because the pupils have different pre-knowledge, successes in learning processes, and learning strategies. The checklists give them an orientation. (Teacher)

> The personal orientation is an important precondition for an effective handling of differences; the mixed-age groups make individual learning paths, learning speed, and learning strategies possible.

> At the *NETSchool (Victoria, Australia)*, which targets young people at risk in the formal system, learning is organised around individualised learning plans and each student has a mentor who oversees their learning progress, resolves communication issues, visits homes to install and check online-learning equipment and develops the individual plans. NETschool learners log their activities in a reflective journal which is shared with their mentors.

Assessment for learning

> **The learning environment operates with clarity of expectations and deploys assessment strategies consistent with these expectations; there is strong emphasis on formative feedback to support learning.**

Research has shown just how important assessment is for student learning. Students need regular and meaningful feedback, while teachers need to assess progress on a regular basis to adapt teaching and materials to their needs. Learners need to understand what is expected of them. Assessments should be consistent with the learning objectives, for otherwise it will be providing information tangential to the main purpose of the learning. In general, assessment can be seen as the bridge between teaching and learning.

In the innovative learning environments included in our study, the key role of assessment is recognised. It is an integral part of the individualisation process just examined and of supporting the learning that is so central to all of them. As the principle states, it is partly about making very clear what the learning is for and how to know when it has been successfully achieved. It is partly about ensuring that the assessment is sensitive to individual strengths and weaknesses so as to adapt activities and materials to the current needs of students so that all students can optimally realise their potential. It is partly about valuing feedback so that the assessment serves the formative purpose.

Clarity of expectations and the general role of assessment

The first part of this principle is very much about the nature of the learning organisation – how it places assessment within its broader aims and expectations about learning and how these are communicated effectively to the learners. These are fundamental in the case study learning environments.

> For the *Instituto Escuela Jacint Verdaguer (Spain),* evaluation is one of their most valuable learning instruments: it does not consist of periodic and final exams that are hidden so that nobody knows what they will be asked about. Results are not a number showing students' acquisition of knowledge as compared to the rest of the class or the standards agreed by teachers for the subject. Instead, each evaluation considers each individual student and reflects his or her progress over the preceding weeks. They have established the following criteria to define an adequate evaluation:
>
> - Clear objectives in order to observe the processes
>
> - Process indicators
>
> - Useful skills to be developed
>
> - Specification of similar situations where students can apply what has been learned
>
> - Information given to students about what they will be asked in the evaluation.
>
> Regular meetings to discuss student work and student rubrics are two methods used at *Courtenay Gardens Primary School (Victoria, Australia)* to develop shared understandings of the expectations of student learning. All learning and planning is subject to a systematic testing programme: individual learning is "measured or

identified through pre- and post-level tests" as well as through on-going cycles of diagnostic testing. Individual Learning Plans are often generated as a result of the on-going assessment cycles, which are documented. The rubrics are used with students to clearly set out expectations which are to be achieved. Student checklists are also used for students to refer to in successfully completing any task.

Teachers at *Instituto Agrícola Pascual Baburizza (Chile)* must let students know the objective of the class. At the end, teachers must ask students what they have learned, through formative questions to the group. By doing this, teachers can identify those aspects that have to be reinforced when starting the next class.

A further innovation at *Lobdeburgschule (Thuringia, Germany)* is in the assessment practice. Assessment is not only used for ratings but is a fundamental process to support self-regulated learning – assessment of content knowledge, but also of the methodical, personal and social aspects of learning. This calls for specific criteria of evaluation which are made transparent for the learners so that the process of assessment is more flexible and comprehensible:

- Formulate a critique and at the same time give pointers for improvement.

- Make expectations clear for the pupil.

- Describe in detail positive and/or negative tendencies in the learner's development.

- Give detailed advice for further development.

The assessment philosophy of the *Discovery 1 and Unlimited Paenga Tawhiti (New Zealand),* is to ensure that all assessment positively impacts student learning and is appropriate to the student's learning goals. No testing takes place unless it enhances and benefits the learning process and allows the learning advisor to work with students to plan the next step.

At the *Jenaplan-Schule (Thuringia, Germany)* not only the cognitive aspects of performance are relevant, but also social learning, the ability to apply oneself, self-reflection, and self-assessment abilities. The transparency of assessment criteria is thus important for both students and between teachers and students and the use of portfolios contributes importantly to this.

A complex learning environment requires complex evaluation and assessment. Hence, together with grades for assignments and projects *Mevo'ot HaNegev (Israel)* also issues reports on matters such as learners' performance, arriving in class on time, bringing school supplies to class, task performance, teamwork, involvement in learning and in campus activities, and so on. Though all learners are required to submit the same tasks on the same date and undergo the same evaluation process, the content and emphasis of the assessment are unique to each learner.

The multicultural programme at *Miwon Elementary School (Korea)* has been consistently evaluated according to students' achievement of the learning goals set for the programme, giving formative feedback. Self and two-way evaluation and performance tests are applied; thus, the integration of the goals-evaluation-formative-feedback framework has facilitated students' understanding of other cultures and of multi-culturalism.

Several of the case study learning environments integrate assessment into detailed processes of goal-setting and recording so that learners and teachers know where each individual learner is and what is expected of him or her.

Students in the *Institut Beatenberg (Bern, Switzerland)* fill out a so-called "Smarty" for every learning task they do on a daily basis, which is a form in which students enter the goal, the procedure and the intended proof of learning at the end of the task. The proofs of learning have to be concrete, checkable products such as a short essay or an oral presentation and are either determined by the learning coach or suggested by the student.

The learners have to plan, monitor and reflect the learning process at *ImPULS-Schule (Thuringia, Germany)*. They take time every morning for planning the aims of the day and the week with the help of their individual learning diaries. An important aspect of the work is the learning contract which is understood as a result of former school reports. The contract includes aims for the whole year. These aims are fundamental for the weekly and daily learning aims.

For every term, each pupil at *One-room School, Gesamtschule Lindental (Switzerland)* has a weekly diary of individual learning objectives – including not only learning content but sometimes also methodological aspects – and these constitute the pupils' weekly plans and are agreed with the parents. Every Monday the pupils get worksheets that the teacher prepared geared to the pupils' individual learning objectives of the term and taking into account the learning progress of the past week. The pupils then copy these new tasks into their weekly diaries. All tasks have to be completed and handed in by the end of the week to be checked and corrected by the main teacher, even if they have already been checked by the pupils themselves. This procedure is chosen not because the pupils might overlook a fault or misjudge their ability to cope with the tasks, but because it allows the main teacher to keep track of the pupils' learning progress, which otherwise might remain hidden to him in this instructional format. The teacher's weekly assessment of the pupils' progress thus forms the basis for the next weekly plan. Every Friday, each pupil completes his or her weekly plan in a one-on-one interview with the main teacher.

Detailed feedback

The use of logs in a number of the cases was discussed in Chapter 5 in relation to how these case study learning environments are "information-rich" about the learning taking place in a formative cycle of design and redesign. In this chapter, some of the different ways in which evaluation and feedback are integral to teaching, learning and the work of the learning environment are discussed in relation to the learning principle in question.

Assessment at the *ImPULS-Schule (Thuringia, Germany)* has a specific guideline: it is feedback for the learner, not judgement about the learner. Feedback is seen as the foundation for reflection and development of the pupil's own learning. Thus, assessment is the spur to new learning and not just an end point.

Teachers at *Community Learning Campus (CLC), Olds High School (Alberta, Canada)* spoke about the ways they are continually working to build formative assessment into their instruction – pedagogical encounters that are part of the fabric of instruction – viewing formative assessment as a process.

In the *Community of Learners Network (British Columbia, Canada)* feedback is made concrete through group processes such as A-P-E (Advisor, Presenter, Encourager

discussions) and feedback sheets such as "Two Stars and a Step" or "Stars and Next Steps" frameworks which students take away and apply to subsequent learning tasks. Most feedback occurs during formative stages of learning activities when they are in progress. The explicit use of learning intentions is evident in the extent to which students within these environments are able to articulate the purpose of what they are doing and why. The key goal of learning intentions is to help create a purposeful orientation.

At the *Enrichment Programmes, Rodica Primary School (Slovenia)* students keep a portfolio of personal achievements with products, files, assignments and short teachers' reflections. The teachers use questionnaires and other instruments to evaluate the learning progress. There are regular student-teacher meetings to talk about the students' progress, and the students also present their results and products in public, in part by using films or multimedia presentations or during art exhibitions.

An important part of the *Jenaplan-Schule (Thuringia, Germany)* is the application of portfolios. The students establish an assessment folder in which are included all texts and further products from different school subjects and projects, and the teacher possesses the same. At the end of the half-year and the year, students reflect on and discuss their portfolio as part of their individual self-evaluation, and prepare themselves for an evaluation talk with teachers and their parents.

Assessment and feedback can become a very visible part of the organisation of the learning environment and of its routines. In some of the learning environments, the assessments are being carried out with the help of new technologies.

E-classrooms enable computer-assisted assessment of knowledge at the *Internet Classroom, Kkofja Loka Primary School (Slovenia)*. By completing tasks and assignments online, students can get immediate feedback about their success and the mistakes they made. Teachers get a good picture of their students' activities: when and how much time they spent in an e-classroom, which sources they were reviewing and which assignments they completed. Parents also have access to parts of the e-classrooms, which enables them to monitor the activities that are in progress in individual subjects, check their children's work, and offer them support.

Every week, students at the *Institut Beatenberg (Bern, Switzerland)* plan and assess their learning activities and define specific learning goals for the week, if necessary with the help of their personal learning coaches. Towards the end of each week, the progress made is then discussed with the learning coach. These weekly meetings are used to check and record the proofs of learning produced by the students. Students who share the same coach present the learning activity of the past week to each other to elicit feedback. On the weekends, the students take their Layout home to their parents to show them what they have learned during the week.

Assessments are announced in the weekly plan at *REOSCH (Bern, Switzerland)*, yet these differ in many ways from those in other Swiss schools. Results are not expressed by a traditional mark but on a four-level scale: excelled – fulfilled well – fulfilled – not yet fulfilled. Learners check and mark their assessments of learning success on their own, with teachers checking them only as a second step and signing to confirm completion. The comparison of self-assessment and that of

the teacher helps the learners develop a differentiated perception and evaluation of their own achievements, which is important in "resource-oriented learning".

Value is placed on the processes rather than the products of learning at *Mordialloc College (Victoria, Australia)*. Teachers structure regular formative assessment conversations with students around the tasks they are undertaking. They support student progress through discussions of learning in the planning, doing, studying, and acting stages.

Several times a year, students, parents and Tutor Group teachers at the *Australian Science and Mathematics School (South Australia, Australia)* meet together and the student takes responsibility for leading an assessment learning conversation. Students are supported in their preparations for the 20-minute reflective conversation by their tutors who assist them in gathering information about their progress towards learning goals, including the use of assessment results. These Learning Conversations replace the more traditionally issued written reports and are also assessed as part of the requirements of completion of the South Australian Certificate of Education.

The very demanding nature of objective-setting, assessment and feedback in many of these learning environments implies, as is made explicit in the next entry, a different role for the teacher.

The strong focus on the individual learning process at *Jenaplan-Schule (Thuringia, Germany)* requires a large number of formative diagnostic instruments, such as the learning diary or portfolio. The stronger the focus is on learner participation in learning assessment, the more the role of the teacher has to become oriented toward the learner. Therefore, the professional role of the teacher must change. In contrast to teacher-centred instruction, self-regulated learning can be realised within these learning environments.

The strong focus on the individual learner, and the endeavour to ensure that each knows what is expected and how well they have achieved, can reap benefits in terms of learner engagement and motivation (Principle 1).

In the *Europaschule Linz (Austria),* a strong emphasis is placed on communication: teachers talk about their lessons and discuss what went well, what went wrong, what the reasons for failure might have been and what they could do differently. They can also draw on another information source: a feedback sheet for teachers who receive feedback on their teaching from their pupils. The comparative study showed that the pupils have a much more positive attitude towards school, and towards learning in general. They approve the grade-free assessment system and many of them regard the detailed feedback to be very helpful in recognising their strengths and weaknesses. Their evaluations of their own abilities show a stronger sense of self-efficacy (i.e. their belief about their ability to perform actions that lead to desired ends) than in the other control school.

Horizontal connectedness

> **The learning environment strongly promotes "horizontal connectedness" across areas of knowledge and subjects as well as to the community and the wider world.**

Complex knowledge structures are built up by organising more basic pieces of knowledge in a hierarchical way; discrete objects of learning need to be integrated into larger frameworks, understandings and concepts. The connectedness that comes through developing the larger frameworks so that knowledge can be transferred and used across different contexts and to address unfamiliar problems is one of the defining features of 21st century competences. Learners are often poor at transferring understanding of the same idea or relationship in one domain to another. Learning environments need to promote "horizontal connectedness": students need to learn through integrating pieces of knowledge into larger frameworks in order to transfer this knowledge to new situations and use it across different contexts. The community and the wider world provide a raft of opportunities and sources for learning, as do learner homes. Meaningful real-life problems have a key role to play in bolstering the relevance of the learning being undertaken, supporting both engagement and motivation.

Connecting across subjects and topics

Many of the case study learning environments organise learning around specific real-world problems that tap into several subjects at once. The aim is often explicitly to make connections and to see "the bigger picture".

> The principal at *Colegio Karol Cardenal de Cracovia (Chile)* reported how he realised that teachers in general were not a source of inspiration for their students and that they moved from one subject to other without investing in their teaching quality. In his perception, traditional education fires disconnected contents at students in which it is more important to be quiet and passive than to be really learning. He decided to motivate and attract students and parents with a new, active, dynamic and interactive system.

> At the *John Monash School (Victoria, Australia)*, students focus on climate change in one semester, for instance, bringing in a number of different disciplines. They learn about its natural scientific basics studying concepts from biology, chemistry and physics, but also discuss the social effects as well as the ethical dimensions of this world-wide problem. The design of the science curriculum seeks to develop "big picture understandings of science in the world" (teacher).

>> This year, across the core science studies the teachers have focused on integrating core ideas in topics such as light, across the major science disciplines: It is often easier to think about biology, chemistry and physics through the different natural occurrences in the world, so it makes sense to students to link these ideas together under a core theme. This has been a different way of conceptualising learning for our learners, and has been challenging for teachers also. (Head of Science)

> Students work on meaningful problems and the curriculum is built around "inquiry cycles" within the *Community of Learners Network (British Columbia,*

Canada). The cycles are framed by an over-arching inquiry question on a specific topic designed to bring together the learning across all curricular areas.

At the *Institut Beatenberg (Bern, Switzerland),* the Units occur periodically and last one full afternoon, with six Units in the school year. They cover topics from the natural sciences, geography and history, and learners may choose from different Units. They are taught by learning coaches and cover subject matter not dealt with in the subject settings. It is an activity-based form of learning organised around small projects. The combination of learning and practical work, production and hands-on experience aims to provide a comprehensive learning experience.

Epochal projects provide the opportunity to deal with a theme in a more extensive way than usual at *Lobdeburgschule (Thuringia, Germany)*. The themes of the epochal projects are seen to be more than a sum of various disciplines: they help to anchor school topics in contexts with a clear reference to applications.

> "We are now working the whole week on one topic. ... I find it better." "Through this continuous work we learn more about the whole topic than by the work at several individual topics." "Learning is more intense." (6th grade learners).

"Connectedness" is the principle summed up by one of the teachers at the *Australian Science and Mathematics School (South Australia, Australia)*, including the potential for synthesis and deep learning:

> Our strength is our commitment to interdisciplinarity ... it provides everything. ... Relationships, curriculum ..., professional relationships. It's holistic. ... It defines what we are and we look at a person in a holistic way. ... We really try to cross the boundaries of subjects. ... So many times we have these moments when something happens here ... something happens there and they come together.

Connectedness to the community and wider society and economy

In many innovative learning environments, "inquiry-" or "problem-based" learning are defined by real-world problems and carried out with real-world partners: universities and vocational training centres, the local business world, libraries, museums, theatres and sports clubs. The previous chapter showed how much emphasis is placed by many learning environments to foster their wider partnerships. We revisit some of these connections in this chapter in their demonstration of the "horizontal connectedness" being promoted by the learning environments.

> The connection between school and the economy activity of the surrounding community is exemplified in the *Instituto Agrícola Pascual Baburizza (Chile)*. The education of these students is guided by a group of farmers from the community, who are part of the school board and make sure that what is taught at the school is linked to real needs: "learning by doing and producing". Internships must be done in real situations to train people and professionals – the students learn about employers' demands and it is expected they will continue to develop throughout their professional lives. All that students learn in internships must have a practical application. All of this is done at the countryside, the "big classroom".

> The early childhood development centre *CENDI (Nuevo León, Mexico)* is not an institution withdrawn into itself and apart from "real life", but on the contrary, it is

from the daily life of the community, its families, its neighbourhood stories, social and demographic developments and traditions that it draws significant content to enrich its educational programme.

The *Culture Path programme (Finland)* is for all elementary schools of the city and involving the community in students' learning process. Students follow one "path" for each grade level, such as the "library path" or the "music path". In so doing, students visit at least one local cultural institution or other cultural destination outside the school environment during the school year. These field trips are accompanied by various pre- and post-learning activities at school and each path is planned according to the requirements and the curriculum for the grade level in question.

Another kind of boundary crossed was that between participating in school activities, on the one hand, and contributing to adult activities outside of school, on the other. The students engaged much more seriously in measurements that were similar to those reported in the national media. For example, the students asked more insightful questions, and realised that conducting the measurements and documenting the results was surprisingly hard and messy. *(Liikkeelle! (On the Move!), Finland)*

At the *Enrichment Programmes, Rodica Primary School (Slovenia)*, students participate in voluntary activities such as helping nursery school teachers or helping in schools for children with special needs.

One of the unique features of the *Dobbantó (Springboard) (Hungary)* programme is that the location of study is not only the classroom, and this is by design: there are occasions for learning outside the school that are part of the curriculum.

At the *Yuille Park P-8 Community College (Victoria, Australia)*, the school and the community are very closely linked as part of the "Community Learning Hub", which includes education, health and facilities for all members of the community. The building is designed so that the community facilities can be accessed from within or outside the school. Having access to these is particularly important for the community, as it is one of the most disadvantaged in Victoria and many parents are unemployed.

The school library at *CEIP Andalucía, Seville (Spain)* supports the publication of the school newspaper, *Nevipens Andalucía*. "Nevipens" means "news" in Romany. The idea of the newspaper is to get students closer to the press and make them assume the role of journalists. They prepare the different sections of a newspaper: leading article, pieces of news on the school and the neighbourhood, culture (with a section on children's literature), reading and library, citizenship, puzzles, dedications, etc. The newspaper helps to open communication and participation of families and other educational agents of the neighbourhood and develops linguistic communication and social citizenship skills in learners.

Part of linking up to the wider society is the natural one of social media and the lives of the "New Millennium Learners" beyond school classrooms (OECD, 2012). As expressed by one teacher in *Lobdeburgschule (Thuringia, Germany)*:

Of course, media, especially new media, determine the life reality of the new generations more than we can sometimes imagine it. There is always enough cause to broach the issue of media in lessons and to use the media. ... The cultural gap is real and so you have to face it. (Lobdeburg Teacher)

Interconnections between the principles

Many of the practices address several principles at the same time, as is well illustrated with the use of assessments. In many cases, students monitor and assess their own learning process and their accomplishments (principle "learner centredness"), the assessments are highly individualised (principle "sensitivity to individual differences"), and are thus much more motivating (principle "responsiveness to motivations and emotions"). Often, peers (principle "the social nature of learning"), parents and external people (principle "horizontal connectedness") are involved in the assessment strategies.

The principles themselves are highly interrelated and "all the principles should be present in a learning environment for it to be judged truly effective" (Istance and Dumont, 2010: 326). The following two illustrative examples show how the learning environment itself has arrived at a holistic understanding of what it is doing and aiming at.

Community Learning Campus (CLC), Olds High School (Alberta, Canada) created a vision "Where students come first" supported by a teaching model that embraces the learning principles identified through the ILE study:

- Engage all learners by addressing their individual needs.
- Embark on active learning through project opportunities and problem-solving activities.
- Offer an interdisciplinary approach which allows learners to design projects based on their multiple intelligences.
- Establish personalised learning communities.
- Develop interactive, dialogue-based teaching.
- Support teachers to become coaches, mentors, moderators and facilitators of learning.
- Infuse technology into learning opportunities.
- Promote life-long learning.

The *One-room School, Gesamtschule Lindental (Switzerland)* homepage might have been written by reference to the set of the ILE learning principles:

"The one-room school in Lindental is a place for the development of the individual." We are distinctive in our high degree of individualisation. Weekly plans for every pupil are generated every week and are adapted to the individual learning progress. Achievement is not primarily assessed in relation to age but is measured by the individual pupil's development.

The mix of different age groups results in natural and social learning situations. Mutual responsibility is not imposed for its own sake, but there is a natural role allocation "like among siblings". These interpersonal dynamics are considered to be character-building.

"We strive for a learning atmosphere that is free of fear, and we don't use disciplinary measures". The older pupils not only have the obligation to help the younger ones, but they also have the right to reprimand them if necessary. The mix of age groups has a positive effect on the discipline in the classroom.

"Our one-room school integrates weak children as well as gifted ones". The teachers at Lindental respond to every pupil, from the first grader with a learning disability to the high-achieving ninth grader.

"Our school takes advantage of its small size". Lindental school is able to react flexibly and unbureaucratically to the changing needs of society and whenever possible, offers such special learning opportunities to suit the pupils' interest, such as early English classes starting in grade 3, even though such classes are not part of the Bernese state school curriculum.

Concluding summary

In summary, the learning activities and practices in the cases amply confirm what research tells us makes for effective, powerful learning and what in practice the learning principles actually mean. This chapter has shown how the learning principles developed in *The Nature of Learning* (2010), which synthesise the knowledge base from research on learning, are already put successfully into practice in real educational settings around the world. Particular practices often address more than one principle at the same time. Naturally, they are not realised in the same way and always need to be seen and interpreted against the backdrop of the local context of the respective innovative learning environment. However, considering that the cases came from a number of different countries and contexts, there is a remarkable number of similarities. As well as confirming their fit with the lessons of research, the practices of the innovative learning environments covered by this report can serve as encouragement and inspiration for others looking to make significant teaching and learning change happen.

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The case studies mentioned in this chapter can be found at:
www.oecd.org/edu/ceri/innovativecases.htm