



**Directorate for Education
Centre for Educational Research and Innovation (CERI), OECD**

Innovative Learning Environments (ILE)

INVENTORY CASE STUDY

The One-Room School in Lindental

Switzerland (Bern)

This comprehensive school has one mixed-age class with students from grade 1 to 9. The children do not follow the programme of a certain grade, instead learning activities are flexibly adapted to their current level of development, allowing the challenging of gifted students as well as the fostering of self-confidence of weaker students. Grade repetition does not exist. Half of the lessons are given by two teachers, with some of these lessons dividing students into two groups according to age or subject. There are very few disciplinary problems, which the school attributes to individualized education and the social dynamics of a classroom in which younger students learn from their older classmates. Learning activities are inspired by Pestalozzi pedagogy, and involve much autonomous work with week plans, with student autonomy increasing with age. Each quarter, lessons are linked to an overarching theme, and students present their work to their parents at the end of the quarter.

This Innovative Learning Environment case study has been prepared specifically for the OECD/ILE project. Research has been undertaken by Anne von Gunten under the supervision of Erich Ramseier from PHBern – University of Teacher Education, following the research guidelines of the ILE project.

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The One-Room School in Lindental

**A Case Study of the OECD Project
“Innovative Learning Environments” (ILE)**

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Introduction

This case study¹ forms part of the project “Innovative Learning Environments” (ILE) which is directed by a team of the *Centre for Educational Research and Innovation* (CERI) of the OECD (www.oecd.org/edu/learningenvironments). The aims of this project are threefold: firstly, to gather scientific findings on effective contemporary learning and on the design of appropriate learning environments. In the context of this project, the term “learning environment” is used to denote the whole range of teaching and learning offered by a school or other educational institution. The second aim is to document a number of inspiring practice examples of which this case study is one. The third aim is to examine different strategies for implementation and change towards innovative learning and to inform educational reforms.

There are over 25 participating countries and regions worldwide, each with its own educational system. In Switzerland, the project participants are the cantons of Berne and Ticino. On behalf of the Department of Education, the Bernese part of the project is carried out by the PHBern University of Teacher Education. In a first step, all nine participating schools wrote a description of their learning environment using a standard grid specified by the project organisers. In a second step, three out of the nine schools were chosen in agreement with the OECD to be described in more detail in a case study: the one-room school in Lindental, the Beatenberg Institute, and the Reosch School.

¹ The present case study was translated from the German by Lukas Rosenberger, Berne.
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Both versions are available online from the PHBern - University of Teacher Education (www.phbern.ch/fe/ile)

A Aims, context and history of the one-room school in Lindental

A.1 A brief description of the Innovative Learning Environment

The one-room school in Lindental is a state school situated in a rural municipality in the Canton of Berne, Switzerland. Lindental is not directly accessible by public transport. In this school, 20 pupils from grade 1 to grade 9 are co-taught by a main teacher who works full-time and who bears the main responsibility for the pupils, a part-time teacher and a needlework teacher. The school's facilities include a fully equipped classroom, a smaller group room and a craft room.

The one-room school in Lindental represents an innovative learning environment insofar as the inclusion of a considerable range of age cohorts within one classroom (from school enrolment at age 6 or 7 until the end of compulsory schooling at age 16) is not considered a makeshift solution but is rather



Figure 1: The school building in Lindental

used as a resource for knowledge acquisition. Instruction consistently focuses on individual, self-directed and social learning in mixed-age learning groups. Certain teaching methods – such as, e.g., the weekly plan (cf. section B.2) – are systematically employed throughout the whole school year. The teachers' educational beliefs and their consequent dedicated use of various individualising teaching methods seem decisive for the quality of the learning experience at Lindental: Beyond the achievement of curricular goals it is the school's declared aim to foster the pupils' willingness to assume responsibility and their ability to learn independently. The teachers as well as the pupils consider this fostering of the pupils' personal and social skills to constitute the special quality of the one-room school in Lindental. There is less agreement, however, with regard to the effects of this learning environment on content learning.

The learning atmosphere is also influenced by the possibility of deliberately choosing this particular school: those parents who decide to send their child to the one-room school in Lindental are clearly in favour of its educational concept, which in turn facilitates intensive co-operation between teachers and parents.

The one-room school in Lindental is particularly successful in integrating children with special needs. The limits of this model of instruction are mainly defined by the large amount of time and effort the teachers have to invest.

A.2 The school system in the canton of Berne²

Schooling is compulsory in Switzerland between the ages of 6/7 and 15/16. The provision and management of public education in Switzerland is the responsibility of the cantons. In the canton of Berne, the first six years of compulsory schooling are on the level of primary school (grades 1 to 6), and the following three years on the level of lower secondary school (grades 7 to 9). In lower secondary school the pupils are assigned to one of two proficiency levels (called *Niveau Real* and *Niveau Sek*), and some municipalities even distinguish a third, even more advanced level (called *Niveau Spez-Sek*)

² Cf. <http://www.erz.be.ch/erz/de/index.html> (28.10.2010)

primarily for those preparing for Gymnasium. After nine years of compulsory schooling, the majority of youths go on to do a vocational training. Most pupils who don't go into vocational training transfer to the Gymnasium (grades 10 to 12). Those attending the Gymnasium graduate with the Matura, i.e. the general qualification for university entrance.

Children with special needs are either taught in special needs classes or integrated in regular classes where they receive a few lessons of special instruction.

Mixed-age classes are not uncommon in the canton of Berne: around 30% of the 4,500 classes in the state schools on the level of primary and lower secondary school are mixed-age classes (not counting the special needs classes). 27.5% of the classes group two or three grade levels together in one classroom, 2.5% group four or more grade levels together in one classroom, and a mere 0.3% of all classes include between seven and nine different grade levels in one classroom (*Amt für Kindergarten, Volksschule und Beratung, Erziehungsdirektion des Kantons Bern 2010*). Lindental is thus exceptional even among the schools that include different age cohorts in one classroom.

The average class size in the state schools in the canton of Berne amounts to 18.5 pupils (grades 1 to 9). On the level of primary school there are 13.8 pupils to every teacher working full-time, and on the level of secondary school this ratio amounts to 11.2 pupils to every teacher working full-time (Swiss Federal Statistical Office HP8).

A.3 Geographical position

Lindental is a hamlet situated in a valley roughly three kilometres from Boll, the closest village. Boll is about seven kilometres to the east of Berne, and while it is still rural, it belongs to the urban catchment of Berne thanks to its public transport connection. Lindental, Boll and six other villages make up the municipality of Vechigen, where there are four more schools apart from the one-room school in Lindental: three primary schools (grades 1 to 6) and one lower secondary school (grades 7 to 9).

A.4 School choice

Pupils in the canton of Berne are normally enrolled in the school of their residential area. Accordingly, the one-room school in Lindental is attended primarily by children living in this hamlet. However, parents who live in the municipality of Vechigen can apply to have their children enrolled in the one-room school in Lindental (I1: 140-146)³. So far every such application has been granted. The parents living in Lindental on their part can apply to have their children enrolled in a different school district – though there haven't been any such applications for more than 10 years.⁴

In most schools in the canton of Berne, pupils are assigned to one of two proficiency levels after grade six. In Lindental, the parents can decide at that point whether their children should stay in the one-room school in Lindental or whether they should transfer to the lower secondary school in Boll, or – depending on their performance level – even to a school in a different municipality that offers the *Niveau Spez-Sek* (cf. section A.2) for those preparing for Gymnasium (I1: 163-164). The pupils usually have a say in this matter, too (I2: 73; I3: 86). If it is a pupil's aim to prepare for Gymnasium, the teachers at Lindental normally recommend the transfer to a different school (I1: 71-73; I2: 59).

At the time this data was collected there were a total of 20 pupils in the one-room school in Lindental, of which 12 either lived in a different school district or were on the level of lower secondary school (i.e. in grades 7 to 9). We therefore conclude that at least these 12 pupils and their parents deliberately opted for the Lindental school.

³ The abbreviations I1-I4 refer to the interviews that were conducted for this case study (cf. sections G.1 and G.2).

⁴ Telephone conversation with Mr. Schibli, 03.11.2010

A.5 Family background of the pupils

At the time this data was collected (between September and October 2010) there were a total of 20 pupils in the one-room school in Lindental. With the exception of one pupil, they all live in a traditional family unit in one household with two parents. The parents' educational backgrounds are highly diverse, ranging from farmers to university graduates.

A.6 Heterogeneity of the pupils

Even though each of the 20 pupils in Lindental is assigned to a grade, they are instructed as one group. Those in grades 7 to 9 are assigned to one of two proficiency levels, like in regular schools (cf. section A.2).

The youngest pupil is 7 years old, the oldest 16. The age distribution is fairly balanced with 8 pupils between 7 and 9, 6 pupils between 10 and 12, and 6 pupils between 14 and 16. The sex ratio is clearly less balanced with 6 girls and 14 boys. A noteworthy feature of the Lindental school is the fact that 14 out of the 20 pupils go to school together with their siblings.

At the time this data was collected there were two pupils with special needs. One pupil was transferred from a special needs class to Lindental where he gets an additional lesson of therapeutic pedagogy taught by the main teacher. The main teacher is qualified for this task due to his training as a remedial teacher (I1: 132-134). Two pupils would probably have to attend special needs classes if they had not been accepted in Lindental (I3: 42, 46), and speech therapy is needed by two out of the 20 pupils (I1: 98-100).

There are no children with a foreign background in the one-room school in Lindental; they all speak a Swiss German dialect as their first language (I1: 135).

As has been mentioned before, the teachers at Lindental normally recommend the transfer to the lower secondary school in Boll after grade 6 if it is a pupil's aim to prepare for Gymnasium (I1: 70). However, there are exceptions to this rule in that some pupils at the Lindental school are specifically supported in their preparation for Gymnasium (I1: 73, 74; cf. section C.1).

A.7 Specific educational objectives

Among the educational objectives prescribed by the Bernese curriculum for all state schools in the canton of Berne, the following three objectives have been identified as particularly important by the Lindental main teacher:

- self dependent working and learning and assuming responsibility
- social skills
- problem solving skills and methodological skills

Teachers and pupils see the inclusion of different age cohorts in one classroom not as a compromise but as an opportunity to better reach these objectives.

A.8 Pedagogical principles

“The one-room school in Lindental is a place for the development of the individual” (from the school’s homepage⁵, henceforth abbreviated as “HP”). The Lindental school is marked by a high degree of individualisation. Weekly plans for every pupil are generated every week and are adapted to the individual learning progress (cf. section B.2). This elaborate procedure allows every pupil to spend the study time he or she needs. And even though every pupil is assigned to a grade, it is still possible for them to learn at their own pace in the various subjects. School 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 (I2: 53 131; I3: 74). Mutual responsibility is not imposed on the pupils for its own sake, but there is a natural role allocation “like among siblings” (from the school’s self description p. 2; henceforth abbreviated as “SB”). These interpersonal dynamics are considered a character building element in the Lindental school (SB: 2).

“We strive for a learning atmosphere that is free of fear, and we don’t use disciplinary measures” (HP). The “natural hierarchy” (I2: 53) among the older and younger pupils is deliberately used to relieve the teachers of part of their workload: the older pupils not only have the obligation to help the younger ones, but they also have the right to reprimand them if necessary. This rule is usually accepted by all pupils since the younger ones know that one day they will be on top of the hierarchy themselves. From this point of view 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” (HP). The teachers at Lindental respond to every pupil, from the first grader with a learning disability to the high-achieving ninth grader. In other words, the school caters to very heterogeneous learning needs. However, there are two reasons why the Lindental teachers have to set clear limits on the degree of individualisation that can be offered and why they cannot provide specially designed instruction for high flyers or special needs pupils: firstly, because it is assumed that heterogeneity of the pupils is only beneficial for their learning as long as it does not exceed a certain limit (I2: 89), and secondly, because it is impossible to achieve a very high degree of individualisation with only two teachers.

“Our school takes advantage of its small size” (HP). As a fairly small institution the Lindental school is able to react flexibly and unbureaucratically to the changing needs of society. For example, the school introduced Early English classes starting in grade 3 as early as in 1992, even though such classes are not part of the Bernese state school curriculum. Whenever possible, the Lindental school offers such special learning opportunities to suit the pupils’ interest.

A.9 On the history of the one-room school in Lindental

The one-room school in Lindental was founded roughly 300 years ago for the residents of Lindental. At that time, it was common to teach several grades in one classroom, and even in the centuries to follow this model survived wherever there were not enough pupils to separate the grades into individual classes and where mobility was limited.

While the Lindental school has been a one-room school throughout its 300 years of existence, the pedagogical principles have changed considerably. This development is most noticeable on the level of classroom activity. Until the mid-1980ies, one-room schools were generally ill-reputed for being authoritarian. It was said that teachers used strong disciplinary measures to manage the large numbers of pupils of different ages. Furthermore, one-room schools used the same methods as other schools, i.e. mainly traditional lecture-style teaching (I1: 187). While Lindental has kept the structural organisation of the one-room school, progressive education ideas have found their way into this school since the 1980ies.

⁵ Cf. http://www.gesamtschule-lindental.ch/index.php?option=com_content&view=article&id=52&Itemid=83 (04.11.2010)

The current educational model of the Lindental school has been particularly influenced by the ideas of Paul Meyer, who had been teaching in Lindental from 1995 to 2002. Following Pestalozzi's ideal of "head, hand and heart" (SB) he pursued the idea of education that addresses the pupils in their entirety as human beings. Furthermore, he advocated the idea of the Freinet movement that the pupils should have the right to learn at their own pace, and introduced suitable teaching methods. His successor since 2002, André Schibli, honours these achievements and continues to develop the ideas introduced by Meyer.

A.10 Political support: relict or reform project?

From an educational point of view an interesting discrepancy can be observed in the political discussions in Lindental (I1: 163): the one-room school is mainly supported by conservative villagers since they consider this type of school to preserve traditional values and structures. Like in former times, children of different ages are taught in one and the same classroom by a teacher who lives in the school building and who takes part in the daily life of the hamlet. For these conservative circles it is of little importance that the pedagogical principles have changed fundamentally. Contrariwise, there are supporters of political parties that generally sympathise with ideas of individualisation and social learning, but that nevertheless are in favour of centralisation, even if this means closing down the Lindental school. They argue that larger schools with only one age group per class are much better able to create equal opportunities for all children (I1: 163). This controversy between the two political forces has become a constant companion in Lindental.

As a result of socio-cultural and economic changes and the revival of progressive education ideas, the last few decades have seen a renewal of the educational discussion on mixed-age classrooms (cf. e.g. Urech 2010). Given its historical and educational context, the one-room school in Lindental can be seen as a relict from 300 years of Swiss educational history, but with regard to its teaching methods it can just as well be considered an innovative educational project. In the Lindental school, concepts for mixed-age classrooms had been developed systematically long before classes with different age groups were introduced as school projects in individual schools in Switzerland (*Schulprojekt 21*; cf. e.g. Büeler et al. 2001).

B Characteristics and structure of the learning environment

B.1 Instructional format

In the Lindental school, one main topic is chosen for every term (trimester). This topic is represented in an appropriate drawing on the blackboard made by either the teachers or the pupils. For example, the main topic for the winter term 2010 was the Bernese Oberland, i.e. the alpine region of the canton of Berne.

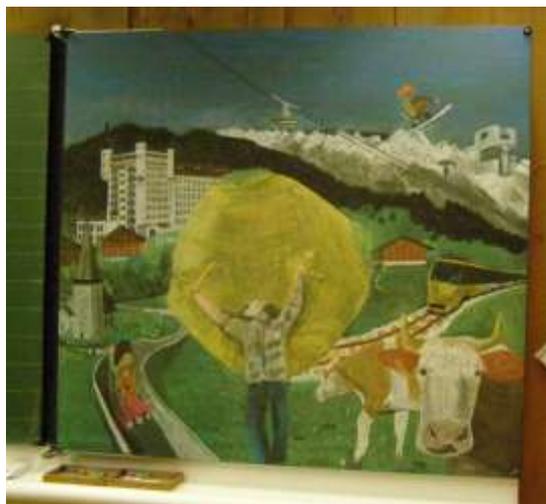


Figure 2: The main topic for the winter term 2010: the Bernese Oberland

Whenever possible the teaching contents are related to the main topic for the term, and every term is concluded with a festive evening where all the parents are invited and where the pupils perform a play or show. The highlight of the school year is the annual school festival which has developed into an important event for the whole hamlet. The parents are heavily involved in the organisation and realisation of the quarterly festive evenings as well as the annual school festival.

Classes normally take place Monday to Friday from 8.00 to 15.45 at the latest, with a lunch break from 11.45 to 13.30.

Although the educational objectives are prescribed by the Bernese curriculum for all state schools in the canton of Berne, this official curriculum still leaves room for the concrete teaching concept. In fact, the teachers are indeed meant to take an active part in

choosing teaching methods and instructional formats. In response to the inclusion of different age groups in one classroom, the Lindental school uses an instructional format that is mainly determined by the following three factors:

- During 20 of the 32 lessons, the two teachers each instruct one group of pupils. Most commonly, the first and second graders form one group and are instructed in a separate group room. Another common situation is when the seventh to ninth graders are taught separately in order to provide them with special learning opportunities in mathematics and foreign languages. During a mere 12 lessons all of the pupils are taught together by just one teacher.
- The lessons at the Lindental school are much more influenced by open and self-directed forms of learning than this is the case in other schools. One example of such an activity is the weekly plan (cf. section B.2).
- The pupils spend most of their time working independently on the tasks designated by their weekly plan. During these phases, however, roughly every quarter of an hour the teacher calls the pupils of a certain grade to join him at a large table at the front of the classroom in order to introduce or discuss new learning content (cf. section B.3).

The teaching structure is mainly determined by the combination of individual work with the weekly plan and teacher input for small groups. Even though the timetable lists four lessons in the morning and a maximum of three lessons in the afternoon, the mornings are usually divided into only two parts with a longish break in between (11: 32).

Since this instructional format entails that the pupils are not confined to working alone at their desks, there are always pupils who are moving around the classroom during classes: the younger ones ask the older ones' advice, some use the internet to find information, or a group of pupils moves to the sitting area in a corner of the room for a group work activity. As long as the noise level doesn't get too loud, this freedom to move round the classroom is not merely accepted by the teacher but is actually considered to be a vital aspect of learning in a mixed-age group: the first and second graders can decide on their own when they need a break. Moreover, the pupils often need additional means like dictionaries or the internet to complete their tasks. It is also part of their weekly plan to go out to the corridor with a Dictaphone and, alone or in groups, read aloud texts, record them and have them assessed by the teacher later on.

One specific characteristic of the Lindental school is the seating arrangement that is chosen to reduce the constant movement in the classroom (cf. section B.4). By deliberately seating lower grade pupils together with upper grade pupils at the same desk, it is often not necessary for them to get up and walk around to ask someone's advice on a learning task.

B.2 The weekly plan

For every term, each pupil has got a weekly diary in which the individual learning objectives are noted down. These objectives – including not only learning content but sometimes also methodological aspects – constitute the pupils' weekly plans and are agreed on with the parents (I1: 43). Every Monday



Figure 3: Remaining tasks from the previous week

the pupils get worksheets that the teacher prepared over the weekend. These worksheets relate to the pupils' individual learning objectives of the term and take into account the learning progress of the past week. The pupils then copy these new tasks into their weekly diaries (I1: 36-45).

The weekly plan contains tasks in the school subjects mathematics, language (i.e. German) and "Natur, Mensch, Mitwelt" ("nature, man and environment"). The pupils work on these tasks independently and can usually choose whether they want to work alone, in pairs or in larger groups. 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. His weekly assessment of the pupils' progress thus forms the basis for the next weekly plan. While correcting the pupils' work he notes down the finished tasks on a control sheet. Every Friday, each pupil completes his or her weekly plan in a one-on-one interview with the main teacher; this setting allows the teacher to address delicate issues if necessary.

If a pupil has not managed to finish the scheduled tasks by Friday, or if there are corrections to be made, the main teacher does not only prepare a new worksheet but also slips of paper containing a list of remaining tasks from the previous week (I1: 38-40). These slips are held together with a clothes pin bearing the pupil's name (cf. fig. 3). In addition to the new tasks outlined on the worksheet, the pupil hence has to finish these tasks from the previous weekly plan.

Both teachers spend a considerable amount of teaching time on the basic skills of reading, writing and numeracy, since these skills form the basis for self-directed learning later on. The first and second graders are taught separately more often than the other grades, and they do not yet work with a

weekly plan. Instead, the teacher assigns them their tasks on a daily basis. The pupils start working with the weekly plan in grade three, but at that time they still have the option of going back to tasks assigned on a daily basis if the weekly plan proves to be too demanding in the beginning (I1: 11-13, 33).

Homework is not set explicitly but is part of the weekly plan. Everything the pupils have not managed to complete by the end of the week needs to be finished at home. It is the pupils' own responsibility to plan ahead and start working at home already during the week if they realise that their tasks cannot all be completed during classes. The first and second graders are again exempt from this rule: their homework is set explicitly by the teachers.

B.3 Teacher input

New learning content is introduced to small groups of pupils (between one and four pupils), typically the pupils of only one grade. Thanks to the teachers' close relationship to the pupils resulting from years of coaching their learning processes, 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 get a glimpse of what the older pupils are currently dealing with (I1: 97).

When introducing new learning content to such a small group of pupils, it is common for the teachers to be repeatedly interrupted by other pupils who either ask questions concerning their weekly plan or who would like the teacher to assess their finished tasks. Though this is a part of the normal classroom activities, it obviously poses high demands on the teachers to perform several tasks at once.

B.4 Joint activities

A large portion of the classroom time is used for individual work with the weekly plan and teacher input in small groups, in other words, for tasks that are carried out either alone or in small groups. In addition, there are a number of joint activities for the group as a whole:

- The main topic for the current term serves as a common thematic basis for a number of subjects such as music, languages, mathematics etc. (cf. section B.1).
- The classes in music and physical education are held with the whole group (cf. section C.1).
- Every Friday a weekly class meeting is held where interpersonal concerns are discussed: the pupils reconcile their differences, agree on social rules within the class, or express thanks (cf. section G.3, P3; I2: 53; I2: 53). It is important to note that the class meeting is chaired by the main teacher, not by the pupils (cf. section G.3, P4).
- In the third or fourth week after the summer break the whole group of pupils goes on a field trip for a whole week. This time in the school year is very important for joint activities, since the group has just said goodbye to the ninth graders and has welcomed the new first graders.

B.5 Facilities and layout of the classroom

The school building in Lindental is an old, not particularly big, timber-framed house; as such it does not differ from the residential houses in Lindental and is not readily identifiable as a school building (cf. fig. 1). On the ground floor there are the main classroom, a corridor used as a cloakroom, and two

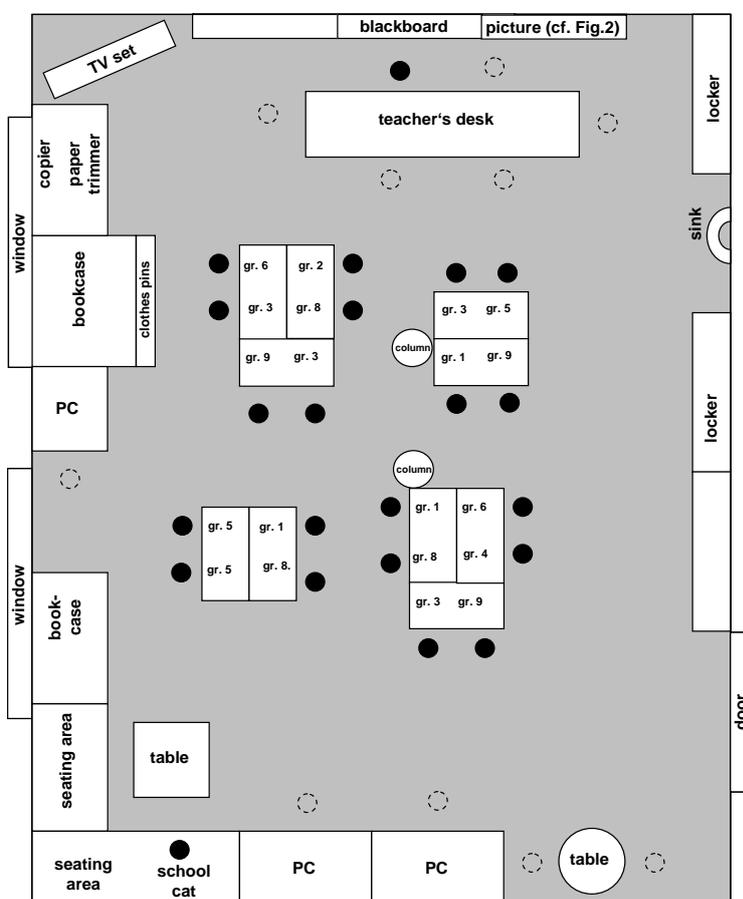


Figure 4: The layout of the classroom

new learning content to small groups of pupils (cf. section B.3). Next to this table there are a copier and a paper trimmer. Furthermore, there are two bookcases and three personal computers at the pupils' disposal. Comfortable seating-accommodation is provided in one corner of the room and is prevalently used for group work. Last but not least there is Max, the school cat, that can move freely around the room and is very dear to the pupils.

bathrooms. The main teacher lives on the first floor with his wife and three children; his children all attend the one-room school.

An external staircase leads to the group room and the craft room on the second floor. The group room is used not only by the pupils but doubles as the teachers' office. The school building is surrounded by a garden, and the surrounding area consists of farmland; there is also a forest to one side. Since there is no gym, a large paved square is used both as a school-yard and a sports ground.

In the classroom, the desks are arranged into four groups of two to three desks each (cf. fig. 4). The seating arrangement follows the idea of mixed-age groups: first and second graders are seated together with eighth and ninth graders. To avoid problems resulting from the difference in size, the younger pupils can use a footstool. The teacher is seated at a large table in front of the blackboard; this is where he introduces

B.6 Marking and assessment of the pupils' learning progress

In the one-room school in Lindental, the individual pupil's development is considered much more relevant than the otherwise common comparisons of school achievement across the pupils of one age cohort. Consequently, marking is limited to a minimum. The teacher assesses the pupils' individual development and their coping with the weekly tasks through observation during the joint activities as well as on the basis of the weekly one-on-one interview and the tasks they have to hand in by Friday every week. In addition, the pupils write little tests every Friday in which they have to solve exercises in the various subjects. These tests are not marked but are used to assess the pupils' individual achievement (11: 85-87).

An important prerequisite for the teachers' ability to reliably assess the pupils' school achievements is professional experience with all age groups represented in the one-room school and a sharpened awareness of developmental processes (I1: 75-81). For example, the teachers have to be able to distinguish pupils who perform above grade level as well as pupils with special needs without the possibility of direct comparison across peers, which is only possible if they know exactly what subject matter needs to be mastered at what age. Since this is only possible with much professional experience, teaching highly heterogeneous mixed-age groups is not recommended for novice teachers (I2: 99).

Even though a large range of standardised tests for monitoring and evaluating progress in the school subjects is readily available, no such comparative tests are used at the Lindental school. However, there is an achievement test organised by the municipality which all the sixth graders have to take. This test provides a possibility of comparison with other pupils of the same age group and can be used as a further basis for the decision whether a pupil should transfer to a different school after grade six.

B.7 Qualifications and professional experience of the Lindental teachers

After he had completed teachers college, the main teacher studied therapeutic pedagogy. He now has 27 years of teaching experience. Before he started working at the one-room school in Lindental he had taught mainly mixed-age classes on all levels of primary and lower secondary school. In addition, he had also taught special needs classes for several years and thus honed his skills as a remedial teacher (I1: 19-26).

The part-time teacher at Lindental also completed teachers college and has been teaching mixed-age classes for 25 years (I4: 21-25).

B.8 Workload of the Lindental teachers

The main teacher is employed full-time and teaches the subjects mathematics, German, "*Natur, Mensch, Mitwelt*" ("nature, man and environment"), physical education and handicrafts. The part-time teacher is employed for 40% of a full-time employment and teaches the subjects French, English (including Early English classes), art and music. In addition, a needlework teacher is employed to teach three lessons a week. The instructional format used in the Lindental school requires a great deal of cooperation between the two teachers, mainly with regard to the preparation of lessons.

Classes in home economics (including such topics and activities as cooking, nutrition and health) and all optional subjects (e.g. playing in the school band) are not offered in Lindental; for these subject the seventh to ninth graders have to go to the lower secondary school in Boll. The two teachers of the Lindental school are furthermore supported by a retired teacher who teaches four lessons a week, though he gets paid for only two of these four lessons (I2: 24, 27).

In sum, the Lindental school has to make do with a little more than 1.5 full-time positions. Considering the number of pupils at the Lindental school, this equals the average teacher-to-pupil ratio in the canton of Berne (cf. section A.2).

B.9 Cooperation with the parents

The Lindental school places great emphasis on intensive cooperation with the parents. They are heavily involved in the planning and organisation of the quarterly festive evenings and the annual school festival, but also in helping their children with homework (I1: 42; I2: 69, 91; I4: 97). As for many parents it was a conscious decision to send their children to the one-room school in Lindental, they generally are in favour of its educational concept and the teachers feel well supported by the parents.

B.10 School board

As the provision and management of public education in Switzerland is the responsibility of the cantons, the canton of Berne prescribes the educational objectives for all state schools in the canton. The municipalities provide and govern the concrete educational opportunities, and the school boards are responsible for the strategic and political guidance of the schools at the municipal level. For example, they are responsible for the infrastructure, they have to ensure that all pupils have access to the school, and they supervise the school headmasters.

Since the beginning of the school year 2010/2011, all the school boards of the individual schools in the municipality of Vechigen have been disbanded and replaced by a single school board responsible for all schools in the municipality (I1: 144).

B.11 Network

The Lindental school aims to establish a network with different relevant actors, motivated by the aim to preserve small schools and to foster mixed-age learning as an innovative educational concept.

- Regarding the network on the cantonal level, the commission for mixed-age classes of the Bernese teachers' union (cf. section F.5, HP4) plays an important role. The Lindental school cultivates its relationship with this commission.
- As a reaction to the disbandment of the school board of the Lindental school, an association called "Pro Gesamtschule Lindental" was founded. The association aims to support the preservation and promotion of the school, especially because the school has repeatedly been threatened by closure in recent times.
- Furthermore, the school keeps in touch with other mixed-age classes in the area.

C The nature and quality of the learning

Prior to an analysis of the specific types of learning found in the Lindental school, this section provides a description of the interplay of the main characteristics of the learning environment and of the learning experience and shows how they influence the quality of the learning.

With regard to the social structure of the learning community in the Lindental school, the main teacher made the following statement: "In my opinion, the biggest plus is the naturalness of it all" (I2: 131), thereby referring to the fact that the mixture of age groups in the learning community is an element also found in society at large. Over the course of nine years, the pupils become integrated members of this small community and they learn to learn as well as to teach. When some of the older pupils were asked about the changes resulting from the enrolment of first graders, who are so much younger than them, one of the older pupils answered: "Well, previously we had been the little ones (all four seventh to ninth graders smile), and when the new first graders came, we belonged to the 'big ones'" (I3: 74). There was a hint of pride in this utterance, and the pupils' smiles showed their agreement. The teachers as well as the pupils repeatedly stressed that a 'natural hierarchy' is inherent in this kind of learning community, and not only in terms of discipline, i.e. by the older pupils reprimanding the younger ones if needed. In fact, the combination of mixed-age teaching and self-directed learning unleashes the new first graders' motivational potential. Some of the statements made in the interviews clearly show that it is of great importance for the pupils to develop from the 'little ones' into those who actually accept responsibility for the younger pupils over the course of nine school years. The seventh to ninth graders are very much aware of this development and of the transitions from one social role to another, and their desire to belong to the 'big ones' motivates them to acquire strategies for self-directed learning. Hence, in mixed-age classrooms the pace at which newly admitted pupils realise the significance of self-directed learning depends not only on the teacher. Furthermore, sharing the classroom with older pupils who are able to learn more self-dependently raises the younger ones' intrinsic motivation; the teachers use these mechanisms in the instructional design, e.g. in the mixed-age seating arrangement (cf. section B.5).

In the Lindental school the social development of the pupils is valued higher than the commonly used comparisons of school achievement across the pupils of one age cohort. The pupils appreciate this approach; one pupil who had attended a different school for several years before transferring to Lindental said in the interview that "if you have a problem in this school you can simply talk to the teacher. That was different in my old school: there you had to figure out things for yourself, or else you were in trouble" (I3: 96). Statements like this show that the teachers indeed manage to shape the learning environment by their attitude of fostering the pupils as individuals.

In what follows, we will distinguish five types of knowledge and skills acquisition in the Lindental school:

- C.1 Individualised learning
- C.2 Social learning
- C.3 Self-directed learning
- C.4 Content learning
- C.5 Collective learning over a period of nine years

C.1 Individualised learning

While individualised teaching methods are not exclusive to the Lindental school, they are certainly one of its characteristics. Those pupils who perform below grade level do not have to repeat the grade but can adjust the learning objectives for the term. Consequently, there are no repeaters in the Lindental school. The pupils who perform above grade level, on the other hand, can adjust upwards their learning objectives (I1: 34-35; I2: 120).

Adjusting the learning objectives for the term or for the school year is just one possibility for individualisation. There is, furthermore, the possibility to cater to individual needs in those phases when the teacher introduces new content to a small group of pupils. As has been described above, pupils of other grades may join the group either because they have to catch up on a topic or because they can already be introduced to advanced learning content.



Figure 4: Geometry class (9th grade)

There are a range of strongly personalised methods for assessing school achievement, such as examining the pupils' work with the weekly plan, the weekly one-on-one interview with each pupil, or the little tests the pupils have to write every Friday (cf. section B.5). Indeed, the seventh to ninth graders feel that their individual learning efforts are appreciated by the teachers (I3: 96). The limited possibilities for comparing learning achievement with pupils of the same age group is considered problematic at least by those pupils who aim to go to Gymnasium later on (I2: 73; I3: 234).

Whenever the possibilities for individualisation are limited, the large differences in the pupils' cognitive and physical development become immediately apparent. This is typically the case in music and physical education, where all the pupils are taught as one group in order to be able to sing part songs and play team games. This is also where older and younger pupils come into conflict with each other sometimes, e.g. over choosing a team game (I3: 191) or a rock song versus a nursery rhyme (I3: 349). The fact that

such conflicts come up from time to time is no big surprise, however, since there are large differences in development between these 7 to 16 year old children and youths. Besides, according to the two teachers these conflicts are relatively small compared to those occurring at other schools (I2: 53).

Pupils who want to prepare for Gymnasium normally transfer to the lower secondary school in Boll after grade 6. This is not a hard and fast rule, however, but the teachers at the Lindental school sometimes go to great lengths to support some of these pupils in their preparation for Gymnasium. For example, one pupil had additional lessons in physics and chemistry, and a retired historian was hired to teach extra history classes to her as well as to some other interested pupils (I1: 73-74).

The limits of this individualised approach of teaching are mainly defined by the considerable amount of time and effort the teachers have to invest, as it is impossible for two teachers to offer 20 individual learning programmes. As a deliberate and self-imposed restriction, the part-time teacher usually prepares courses for merely five groups and provides further individualisation only if a pupil has difficulties keeping up with his or her group (I4: 63).

Both teachers point out that the additional work resulting from the use of individualising methods is at least partly outweighed by easier classroom management: because the pupils are attended to individually they feel over- or under-challenged less often than in regular schools, and consequently they disrupt the lessons much less frequently (I2: 53; I4: 43).

C.2 Social learning

One of the eighth graders describes his impressions upon his transfer to the Lindental school as follows: "I like the way everybody helps each other. I mean, the older ones help the younger ones. And the program is totally different here; you can organise it yourself. We don't always work on the same task. And the teacher does not just stand in front of the class and you have to copy from the blackboard" (I3: 70). Apart from individual work with the weekly plan this pupil thus mainly remembers so-

cial learning situations that included both older and younger pupils. In the group interview, the seventh to ninth graders name the cooperation among the pupils as the most characteristic element of their one-room school. They have clearly developed an understanding of the purpose and the advantages of learning through teaching and have come to appreciate these particular opportunities to consolidate their knowledge in the various subjects (I3: 70, 230).

Even though social learning is usually understood as “learning through helping others”, classroom observations show that social learning is not misunderstood as a self-sacrifice (cf. section G.3, P2, P3). It is also part of this heterogeneous learning setting to learn to say no: for the sake of their own learning progress the older pupils need to learn the limits of their readiness to help others, because helping the younger pupils usually is a time-consuming task and keeps the older pupils from working with their own weekly plan. As a result, they sometimes have to invest a lot of time at home to catch up on their scheduled tasks (I3: 219).



Figure 5: Tying shoelaces

The main teacher points out that there are gender-related differences in the social behaviour of the seventh to ninth graders: while the girls help willingly and spend a lot of time “learning through helping”, many of the boys take a more critical stance towards social learning and sometimes need to be reminded of their duties towards the younger pupils (I2: 75).

It is a responsibility of the older pupils to support the teachers in educational and disciplinary matters and oftentimes also to take on classroom management duties. They reprimand the younger ones if they adopt the wrong tone or if it gets too noisy in the classroom. They tend to the younger

children quite generally, e.g. by tying their shoes before physical education classes (cf. fig. 6) or by watching out for danger (I2: 53).

Due to the fact that some pupils leave the learning community after grade 9 and new first graders enter the school every year, the social dynamics within the class is softened. In regular schools, social roles within the class are usually fixed after some time. Over the course of their nine years in the one-room school in Lindental, however, the pupils take on different social roles (I2: 131; I3: 74).

A difficulty repeatedly pointed out in the interviews is the noise and disturbance caused by pupils helping each other during the lessons. For many pupils this makes it difficult to concentrate on their tasks (I3: 216). The upper grade students can even tell by the noise level whether the first and second graders are taught separately in the smaller group room.

The concept of “learning through helping others” is not only demanding for the pupils but for the teachers as well, since they have to be multitasking most of the time. For example, when they introduce new learning content to one group of pupils they still have to monitor the pupils doing group work to determine whether they are really working on the assigned tasks or whether they are fooling around and need to be reprovved (I3: 351).

C.3 Self-directed learning

It is evident that self-directed learning is both means and end in the Lindental school: on the one hand, both pupils and teachers value highly the ability to work self-dependently, and on the other hand the teachers stress the impossibility of teaching such a mixed-age group without self-dependent work of the pupils.

The interviews and classroom observation protocols abound with concrete examples of how the pupils initiate or manage learning processes on their own. For example, one day the main teacher

needed to attend a short-notice meeting with a municipal worker. Upon his return to the classroom he found that the pupils had taken over the organisation of the lesson as one group and were singing a song together (I2: 55). At another time during a music class, all the pupils were singing a part song. When one of the ninth graders realised that the second voice had intonation problems he got up – without being asked to by the teacher – during the song, fetched a xylophone and helped the second voice stay in tune by playing the difficult notes to them (cf. section G.3, P3; I4: 68-69;).

In the teachers' opinion, individual work with the weekly plan not only fosters the pupils' self-reliance and independence, but it furthermore relieves the teachers from bearing the sole responsibility for classroom management. "Learning through helping" offers the same advantage, though it needs to be added that this positive effect is only achieved once the pupils have become familiar with this kind of work. The part-time teacher states that "if everyone has got something to do, then everything runs smoothly. In this regard, the weekly plan even has a self-regulating function. It takes more time preparing the lessons, but I don't need that much energy to settle disputes. The lessons are much less disrupted because the pupils always know what to do, and that keeps them from being bored" (I4: 43).

Over the years, the pupils get to know many different exercises and methods which the teachers can then use to keep them busy alone, in pairs or in groups. One example for such pair work would be the exercise cards the pupils use to train logical reasoning or mental arithmetic: each card contains a question and the respective answer, and the pupils can not only ask each other these questions but also check the answers without the teacher's help (I4: 73).

One drawback of the weekly plan becomes apparent with children or youths who are not very self-disciplined and who develop this character trait only slowly over the years. As has been explained above, if a pupil has not managed to finish the scheduled tasks of the weekly plan by Friday, he or she has to finish these tasks during the next week. However, there is a limit to the workload that can be moved to the next week. If too many tasks are unfinished at the end of the week, the teacher may decide to exclude the pupil from physical education classes and have him or her work on the unfinished tasks instead. The pupils perceive this decision differently: while some see it merely as a punishment, others accept it as a self-inflicted opportunity to catch up on the subject matter (I2: 51).

The main teacher basically assumes that children are naturally curious and have a strong urge to learn new things. He is aware, however, that for some children this is merely wishful thinking. Time and again there are situations that require special supervision (I2: 69). No age-group is exempt from occasional non-productive group work. By checking up on the completion of the weekly plan by Friday the main teacher is able to gain insight into the efficiency of the individual workgroups and can request the respective pupils to deal with their tasks more thoroughly (I2: 23). In a self-critical vein he also mentions possible weaknesses of his teaching methods that may result from the huge demand put on his power of observation by the challenge of multi-tasking in a mixed-age classroom. With regard to listless pupils he acknowledges that "for a child who refuses to comply it is easier to elude his or her tasks in Lindental than in a regular school" (I2: 67).



Figure 6: Group work using the computer

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Especially for the younger pupils every effort is made to introduce them to modes of independent work. For example, in one case the parents of a particularly listless pupil had to be involved: it was agreed that the pupil should do homework assigned to him by the main teacher for half a day every week under the supervision of his mother instead of at school. The teacher and the pupil's mother had previously discussed strategies that should enable the child to develop his own methods of working independently and of organising his time (I2: 69). This example also shows that the teachers at Lindental depend heavily on the cooperation with the parents.

If pupils manage their own learning, this involves a certain amount of noise and disruption in the classroom, similar to "learning through helping" (I2: 81). Therefore the additional group room is very important as an alternative space for group work, as are the corridor and – in summer – the front yard, provided that the pupils use these spaces sensibly (I2: 59). Especially the younger pupils need to be instructed by the teachers in this regard.

The pupils as well as the teachers think that the pupils normally have no difficulties working with their weekly plan. As with most other instructional formats, however, some pupils find ways of avoiding this particular type of work. For example, in the interview some of the older pupils report a case when a pupil had copied the solutions from the teacher's solutions manual (I3: 271, 280). Yet, the relation between teachers and pupils at the Lindental school is generally based on mutual trust, and both teachers stress that the vast majority of pupils highly appreciate and make use of this opportunity of responsibility.

In earlier appointments in other schools the main teacher had made the experience that disciplinary problems, especially of older pupils, can become so severe as to make knowledge transfer in the classroom virtually impossible. In comparison to such serious situations found in other schools, he considers the disciplinary problems in the Lindental school to be very small. The odd schoolyard fight can usually be settled by talking to the involved pupils or in the weekly class meeting (cf. section B.4) (I2: 53).

C.4 Content learning

Opinions differ on the efficiency of content learning at the Lindental school. In one of the group interviews the question was asked whether pupils in Lindental learned more than in other schools. This question triggered the following discussion between an eighth grader (A), a rather weak ninth grader (B) and a ninth grader who aims to go to Gymnasium after graduating from Lindental (C):

B: "Well, I learn more in this school. In my old school we were just cramming for one lesson, then we had recess, and after that we had already forgotten everything we had done in the previous lesson. Here I have some more time. I have more time to think things over."

Later in the discussion the topic of content learning was taken up again:

C: "But are you sure that we get to learn more here?"

A: "Nope, I'm not really sure we learn more here. I mean, content-wise. But I think we learn more social stuff."

B: "OK, maybe not content-wise..."

C: "You learn to work together, and working methods. But not more content, I don't think so..."

The ninth grader who aims to go to Gymnasium (C) doubts whether he gets to learn more content at the Lindental school than at a different school; his needs hit the limit of what the Lindental school is able to offer. Since he is the oldest and most advanced pupil in the school, we can assume that he lacks the possibility of asking other pupils for help if the teachers are not available. However, even he admits that there are advantages to the Lindental school, notably with regard to working methods and social skills. In contrast, the weak ninth grader considers it an advantage to be able to learn at his own pace.

Later in the discussion, A made a contribution which seemed to sum up the opinion of all three pupils. With regard to their future work life he argued why he considers the large share of time spent on self-directed learning to be an advantage:

A: "Later on in our work life we'll have to organise our work, too, for example, if your boss tells you 'this or that has to be ready by Friday!' That's why I think that our teaching model is better than the other one."

The main teacher points out that several youths (four during the past eight years) successfully attended upper secondary schools after nine years of compulsory schooling in Lindental (I1: 168). Though he acknowledges that they may have had some gaps in certain subjects (like, e.g., physics or chemistry) when they entered upper secondary school, he also asserts that their working methods and working morale enabled them to catch up rapidly. He furthermore reports that parents and vocational instructors testify that the youths' gaps in content knowledge are compensated by their methodological and social skills as well as their willingness to assume responsibility (I1: 176). Still, both teachers admit that they have to make concessions regarding the pupils' preparation for upper secondary school, as this represents yet another request for individualisation that makes too great a demand on the teachers' time and energy (cf. section A.4).

When asked how they deal with the fact that the teachers usually have only little time to introduce new learning content, the seventh to ninth graders confirm that there is sometimes very little time indeed to grasp the teachers' explanations of a new task, and that they sometimes have to resort to asking the best pupil in the class to explain the task once more (I3: 249, 254).

The characteristics of content learning at the Lindental school vary according to the school subjects:

- In the primary school years, a considerable amount of teaching time is spent on the basic skills of reading, writing and numeracy, in order to provide the pupils with the primary skills required for self-directed learning.
- Compromises with regard to contents have to be made in the subjects music and physical education since this is where all the pupils, from seven to 16 year olds, are taught as one group.
- In the language classes it proves difficult to provide the pupils with sufficient opportunities for oral practice. This is a problem especially for the foreign language classes: working in pairs or groups is hardly an option here because the pupils are usually not able to correct each other's pronunciation, morphology and syntax. Although the use of media such as Dictaphones or interactive PCs may help the learners greatly, every recording that is made in class means an additional effort for the teachers since they have to check and correct these recordings after class (I4: 29).

C.5 Collective learning over a period of nine years

The learning environment offered by the one-room school in Lindental stands out not only due to the mixed-age classroom but also due to the fact that the main teacher supports his pupils' development over the whole nine years of contemporary schooling. This long period of time spent together allows the main teacher to develop a deeper understanding of the pupils and he consequently claims to understand his pupils better than an outsider would. Over the course of nine years he can not only revisit certain topics and methods, but this model of cyclical learning has yet an additional quality: the common background and context knowledge enables him to assist each pupil individually in linking new learning content with past learning situations and shared past experiences (I2: 62-63).

D The impact and effectiveness of the Innovative Learning Environment

D.1 School choice

The one-room school in Lindental competes with the other schools in the area insofar as the parents can choose between the educational concepts of the different schools (cf. section A.4). The fact that Lindental was a deliberate choice for 12 out of the 20 pupils could therefore be seen as evidence of the school's quality (I1: 164-165; KL)

D.2 Successful integration of children with special needs

The one-room school in Lindental is particularly successful in integrating children with special needs, be it children who previously attended a special needs class or who were about to be transferred from a regular school to a special needs class. Concrete cases are documented for a child with learning disability (I3: 42-46) and a child with severe disciplinary problems (I1: 135). Both children successfully completed compulsory schooling at the one-room school in Lindental.

D.3 Moving on to vocational education or upper secondary schools

Since 2002, a total of four pupils have left the Lindental school after grade six and transferred first to a lower secondary school offering special preparation for Gymnasium (*Niveau Spez-Sek*) and later to Gymnasium (cf. section A.4). One pupil transferred to Gymnasium directly from Lindental after grade 9 (I1: 169-175). Although these numbers are too small to allow any conclusions regarding the efficiency of the particular learning environment in the Lindental school, they still demonstrate that it is by all means possible for former Lindental pupils to attend upper secondary schools.

The majority of the Lindental school leavers go on to do a vocational training after grade 9 (I1: 177), and the vocational teachers mainly testify to the youths' highly developed personal and social skills.

E Considerations on the transferability of the Innovative Learning Environment

The past years have seen a great deal of discussion on the educational benefit and adaptability of certain elements of instructional models, such as the integration of children with special needs or mixed-age classes (cf. Urech 2010; Dietl et al. 2008). In the interviews conducted in this case study a number of factors are mentioned that seem to have contributed to the success of these elements, all of them relating to the Lindental school culture that has developed organically over the past 300 years:

1. *Educational attitude of the school and the teachers:* In order for the mixed-age classroom to be an effective resource for the pupils' learning, it is not enough to use specific teaching arrangements and methods, but this also requires a corresponding, perceptible educational attitude of the teachers: Individualisation is not a tool that is employed for economic reasons in order to be able to teach different grades in one classroom, but it is used out of the belief that the overarching goal of learning is each pupil's personal development. Hence, the focus is on individual feedback rather than assessments by means of marks. Furthermore, the primary aim is not school achievement but the pupils' development into considerate, caring, responsible and also capable members of society. Apart from knowledge transfer, the school aims to develop the pupils' social, methodological and self-organisational skills.
2. *Teaching arrangements and methods:* The mixed-age setting requires teaching arrangements and methods that are adapted to the pupils' highly heterogeneous needs. Instruction in the Lindental school is purposefully geared to the cooperative learning of younger and older pupils, for example, by way of a mixed-age seating arrangement or by the constant alternation between input in small groups and work with the weekly plan (cf. sections B.1 to B.5).
3. *The limits of heterogeneity:* The variation in the pupils' age, learning pace, giftedness, first language, social behaviour etc. must not be so large as to outweigh all similarities which instruction normally has to rely on (I2: 89; I4: 63).
4. *Class size and workload:* The degree of individualisation that can be achieved depends heavily on the class size and on whether teachers work full time or part time (I4: 41, 44-45).
5. *School choice and cooperation with the parents:* Parents who get heavily involved with their children's education are an important resource for a one-room school (I2: 89, 91, 111; I4: 47; 59). Therefore, the option of choosing a school with a specific educational concept enhances the parents' support of the school.
6. *Identification with the school:* Teaching at a one-room school generally requires more time and effort than a regular school. Teachers not only have to identify with the school, but they must be motivated enough to work long hours (I2: 24-25, 96-97, 101; I3: 310; I4: 41, 45).
7. *The teachers' qualifications and professional experience:* teaching at a one-room school requires a lot of professional experience with as many age groups as possible; it is therefore not recommendable for novice teachers (I2: 99; I4: 61). Ideally, the teachers at one-room schools should be all-rounders rather than subject teachers because they have to teach the school subjects to nine different grades (I2: 105, 107).
8. *The staff costs are decisive for a school's finances.* The staff costs of the one-room school in Lindental do not exceed the cantonal average. The Lindental school model could thus also be funded elsewhere.

An important result of this case study is the insight that one-room schools must be understood as 'delicate ecological systems' since their well-functioning depends on the interplay of a host of factors: the political climate, professional experience, the teachers' qualifications and their identification with the school, cooperation with the parents, the amount of heterogeneity in the class etc. Therefore, it is to be assumed that for any attempt of copying the Lindental model – whether in whole or in part – in

other schools, two important factors have to be kept in mind: firstly, it is not enough to introduce isolated instructional innovations, but it is crucial to implement an integrated concept that accounts for the interplay between the factors mentioned above. Secondly, it must not be forgotten that an educational reform based on the Lindental model takes a great deal of time if a stable balance in the complex interplay of educational, institutional and social elements is to be created.

The Lindental school represents one of those rare cases where children and youths from 6 to 16 years of age are taught together in an institution that gives the impression of a well-honed system that has developed organically and has been educationally successful for several decades. The quality of the Innovative Learning Environment offered by the Lindental school seems to be based mainly on the favourable conditions resulting from the above mentioned factors 3 to 5 (cooperation with the parents, identification with the school, and the teachers' qualifications and professional experience).

Based on these considerations, the opening or relocation of a one-room school or even just the introduction of the above mentioned instructional elements appear to be particularly demanding. However, from an educational point of view it is of great interest to analyse which of the elements of the educational model presented in this case study can be fruitfully integrated into other school systems. In the canton of Berne, steps have been taken in this direction for example with the educational pilot project called *Basisstufe*⁶ (cf. section F.5, HP6) or with the Lindenfeld school⁷ that is also part of the ILE 'universe' of the OECD (cf. section F.5, HP7).

⁶ With the pilot project *Basisstufe* (basic level) of the canton of Berne, school entrance age is made flexible: kindergarten as well as the first and second grade are merged into one basic level that can be attended by four to eight year olds for a period of three, four or five years, depending on their ability and individual development. This pilot project runs from 2005 to 2010.

⁷ In this school, the pupils on the level of primary school are instructed in mixed-age classes combining three grade levels.

F Methodology and references

F.1 Project team

Project leader: Prof. Dr. Erich Ramseier

Researcher: Dr. des. Anne von Gunten

Translator: Dr. Lukas Rosenberger

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F.2 Methodology

- *Guided interviews*: Based on the specifications of the ILE project, guidelines for four interviews of roughly one hour each were developed. Two interviews were conducted with the main teacher of the Lindental school and one with the part-time teacher. In addition, a focus group interview was conducted with three students of grade 8 and two students of grade 9 (i.e. all the students of grades 7 to 9 who were present on that day). All interviews were digitally recorded and transcribed in standard German instead of the Swiss-German dialect (cf. section G.2). For analysis and interpretation, the transcripts were thematically coded.
- *Telephone interview*: A telephone interview was conducted with the president of the former school board of the Lindental school. Due to lack of time, this telephone call could not be transcribed. Only the most important points were included in the analysis.
- *Observations*: On four different days, a member of the research team observed the classes at the Lindental School and recorded the observations in a written protocol (cf. section G.3).
- *Document analysis*: Several documents and internet sources on the one-room school in Lindental (cf. section G.4) were compiled and used in the analysis.

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- HP2 Website of the municipality of Vechigen: <http://www.vechigen.ch/> (2010-11-26)
- HP3 Website of the association in favour of the one-room school in Lindental (Verein Pro Gesamtschule Lindental), part of the Lindental school website: http://www.gesamtschule-lindental.ch/index.php?option=com_content&view=article&id=55&Itemid=77 (2010-11-26)
- HP4 Website of the commission for age-mixed classes, teacher union of the canton of Berne: <http://www.lebe.ch/lebe/de/kommissionen/fk-koma.html> (2010-10-29)
- HP5 Educational system of the canton of Berne: <http://www.erz.be.ch/erz/de/index.html> (2010-10-28)
- HP6 Basisstufe (basic level): http://www.erz.be.ch/erz/de/index/kindergarten_volksschule/kindergarten_volksschule/projekte/basisstufe.html (2010-11-25)
- HP7 Website of the Lindenfeld school: <http://lindenfeld.kibs.ch/> (2010-11-26)
- HP8 Swiss Federal Statistical Office, educational indicators (school year 2008/09): <http://www.bfs.admin.ch/bfs/portal/de/index/themen/15/02/key/ind5.indicator.51312.513.html> (class size)
www.bfs.admin.ch/bfs/portal/de/index/themen/15/02/key/ind5.indicator.51311.513.html (student-teacher-ratio)

G Appendix

G.1 Notes on the references

The case study includes many references to data sources. These references include the shorthand symbol for the source and the number of the clause within the source. For example, (I2: 35) refers to clause 35 in Interview 2.

G.2 Interviews

- I1 Interview 1: September 15, 2010; interviewee: main teacher
- I2 Interview 2: September 23, 2010; interviewee: main teacher
- I3 Interview 3: September 17, 2010; group interview with students of the one-room school
- I4 Interview 4: October 1, 2010; interviewee: part-time teacher
- I5 Interview 5: November 4, 2010; interviewee: president of the former school board of Lindental

G.3 Observations

- P1 Observation 1: April 29, 2010; observer: Erich Ramseier
- P2 Observation 2: September 15, 2010; observer: Anne von Gunten
- P3 Observation 3: September 17, 2010; observer: Anne von Gunten
- P4 Observation 4: September 24, 2010; observer: Christoph Gautschi

G.4 Documents on the one-room school in Lindental

- SB Self-description of the one-room school in Lindental, as submitted to the ILE-project
- SP Lesson plan of the one-room school in Lindental, school year 2010/11
- KL Student list of the one-room school in Lindental, school year 2010/11
- RS School and Kindergarten Regulations for the municipality of Vechigen
(*Reglement über das Schul- und Kindergartenwesen*)

Publications by the former main teacher at Lindental:

Meyer, Paul Michael (1993). *Liebe Eltern, die Schule ist nicht so*. Bern: Zytglogge.

Meyer, Paul Michael (1994). *Die biografische Schule*. Bern: Zytglogge.

Meyer, Paul Michael (2009). *Lehrer sein*. Bern: Zytglogge.

G.5 Visual Data

Miscellaneous digital pictures and films of the one-room school in Lindental are available. Written permission has been granted by the Lindental teachers and the involved parents to use this material in project publications.