COLLECTIVE LEARNING IN SCHOOLS DESCRIBED: BUILDING COLLECTIVE LEARNING CAPACITY

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1. COLLECTIVE LEARNING IN PROFESSIONAL LEARNING COMMUNITIES

This decade has shown a growing interest in so-called professional learning communities. A number of studies make clear that these learning communities of teachers and school ma-nagement, focussing on a collective job-related reflection, positively effect the professional functioning of teachers, the development of the school and, as a consequence, the pupils' outcome (Hord, 1997, 2004; Leithwood, Jantzi & Steinbach, 1998; Bryk, Camburn, & Louis, 1999; Morissey, 2000)

According to Hord (1997:3) a professional learning community refers to a community of learners, in which teachers continuously seek and share learning and act on what they learn. They share, investigate and improve the everyday situation of teachers and school management in order to improve the education of the pupils: *"A professional learning community is a community of continuous inquiry and improvement"* (see also Morrisey, 2000:3, Mitchell & Sackney, 2000:9; Verbiest & Vandenberghe, 2002).

Important characteristics of professional learning communities are (Verbiest 2004):

- A clear, explicit and shared vision towards the pupils' learning and its support by their teachers and school. The pupils' learning, the outcome of this and its improvement, are the focus of attention of their teachers.

- Examination of the individual teaching practice and educational views by the teachers and school leader. Collective learning processes and a reflective dialogue among the professionals about their performance in the classroom and their teaching as such, play an important part.

- Supportive and shared leadership which creates possibilities for co-learning.

- Supportive cultural and structural conditions such as mutual trust and space and time for frequent interaction among members of the group.

The increasing attention for professional learning communities is to be explained from a mixture of influences and motives: for example, the increasing complexity of a teacher's task which requires an intensive co-operation among the teachers (Mitchell & Sackney, 2000:62; Scribner, Hager & Warne, 2002:71); ideas about the so-called *learning organisation* (Senge, 1990; Senge, Cambron-McCabe, Lucas, Smith, Dutton & Kleiner, 2000) and changed views on the learning of professionals which point out the importance of investigation into one's own 'action theories' in a critical dialogue with colleagues (Smylie, 1995; Argyris & Schön, 1996; Verbiest, 2002). Moreover, professional learning communities would offer better conditions for renewal of education, such as a supportive culture (Hord, 1997:1; Dufour & Eaker, 1998; Louis & Leithwood, 1998:276, 279f., 283; Morrissey,

2000:12f.) and professional learning communities could decrease experiences of alienation of pupils and teachers (Louis & Leithwood, 1998:280; Mitchell & Sackney 2000: 2f.; Kruse 2001:360).

In several definitions of professional learning communities there is a common emphasis on sharing and researching the educational practice, with the explicit idea to improve it. In this article this is defined as 'collective learning'. Several authors describe the (critical) exchange between individual and collective knowledge and mental models as the essence of collective learning (e.g. Kim 1993; Dixon, 1994; Nonaka & Takeuchi, 1995; Wenger, 1998; Huysman, 2000)[i]. Collective learning may result into a communal language, in which collective approaches, knowledge and skills are expressed and cultivated. Through collective learning processes a collectivity (a group, a team, an organisation) constructs or reconstructs knowledge.

Two main arguments can be put forward in favour of collective learning processes at schools. The first argument refers to the professional development of educational professionals. A constant aim at a higher quality is a characteristic of a professional. Ideally, professions have a specialised knowledge base. It is this knowledge base in particular which turns out to be the flaw in the professional status of teachers. Job-related work procedures and standard solutions are not in agreement, whereas the pedagogic-didactic knowledge component is said to be poor (e.g. Kelchtermans, 1994a: 65; Kwakman, 1999:28v.). Part of the discussion about the professional character of the educational profession also refers to the nature of this knowledge base. Not only would the knowledge base consist of systematic theoretical knowledge, but also – and to an important extent – of practical knowledge. Practical knowledge, practical wisdom or practical insight is the ability to recognise what is best for a pupil in a certain situation and to realise this as much as possible by an adequate use of experience, skills, expertise and the required measures (Jochemsen, 2003). Practical knowledge refers to a complex of knowledge, ideas and values in relation to the way one performs one's profession; such a complex is gained by a professional based on his own personal and professional experiences and it directs strongly one's professional performance (Verloop, 1992).

Practical knowledge is a teacher's answer to work-related situations which are often complex and ambiguous. However, this does not imply that the quality of the practical experience of the educational professionals is beyond improvement. Practical knowledge is vulnerable knowledge. Teachers work in complex, vague, unstable, unique situations, often full of possible conflicts of value. The development of practical knowledge is a learning process which is frequently an implicit one. Similar to other learning processes, new information and new experiences are interpreted within existing frames of references or mental models. More than twenty-five years ago, sociologist Lortie (1975) launched the idea that the tenaciously traditional character of education stems partly from the fact that teachers often teach the same way as they were taught. As former students, teachers underwent a long 'observational apprenticeship' which taught them the expectations towards teachers and students. Besides, in the development of practical knowledge, psychological processes play a part, such as the influence of the first impression of students or focussing of special attention to unfamiliar events, like dysfunctional students in the classroom. Furthermore, teachers develop routines based on their performance in class and the estimated effects of this. However, routines stimulate the implicit character of the performance and could lead to a one-sided view of the everyday situation at school. However necessary routines may be, in the long run they can become dysfunctional because different circumstances and new possibilities are ignored.

Educational professionals often develop and preserve practical knowledge without realising. This practical knowledge is not critically checked entirely by the teacher and therefore its validity is not fully guaranteed. This is the reason why critical reflection on the practical knowledge, which tends

to be implicit, is important for the professional development of the teacher. This reflection enables the teacher to clarify his or her knowledge base and, if needed, to improve it. Social validation of practical knowledge is to be preferred to self-validation.

There is a growing awareness of the fact that professional development as a learning pro-cess needs reflection of the actual professional performance, in dialogue with colleagues. Making practical knowledge more explicit and the reflection on it, in dialogue with colleagues, stimulate the professional development of teachers. In other words, collective learning pro-cesses of teachers can contribute to the professional development of these teachers by clarification and improvement of their practical knowledge and their performance based on this (e.g. Osterman & Kottkamp,1993; Kelchtermans, 1994; Eraut, 1995; Korthagen, 1998; Day, 1999:226). In this way a contribution is made to a further professional upgrade of the teaching profession and a revaluation of the professional autonomy of teachers which seems to deteriorate increasingly (Eraut, 1997:39, 41; Kruse, 2001:360; Vandenberghe, 2004).

A second argument in favour of collective learning processes among educational professio-nals refers to school development. The ability of an organisation to develop and apply know-ledge at all levels – this is, the ability of an organisation to learn at all levels – tends to be looked upon as a core competence (e.g. Morgan, 1986: 77f.; Senge, 1990; Nonaka & Takeuchi, 1995). Learning as an organisation is often considered to be desirable and even necessary, also for schools. Schools would increase their effectiveness and their policy-making and innovative capacities, if they learned as an organisation. This would enable them to respond more adequately towards numerous changes and innovations, not only today but also in the future (e.g. Mahieu, 1995; Simons, 1997; Leithwood & Louis, 1998:6). Connected to this, the doubtful effectiveness of many education reforms may be put forward. These reforms are seldom implemented satisfactorily within the classroom. An important reason for this poor effectiveness is found in the fact that there is an insufficient involvement on the side of the teachers with regard to the proposed education reforms and their implementations. A successful development and implementation of school policy which can be found back in class, require learning processes, both from individual teachers and the collectivity (Van den Berg & Vandenberghe, 1999:134v.).

Moreover, in a time of an increasing demand of production of knowledge, the omnipresent model of separate knowledge development (e.g. at universities) and knowledge application (at schools) does no longer suffice at modern schools; another obstacle is that knowledge and skills available are locked up in the minds of individual teachers. Development and application of knowledge ought to be connected more closely; schools need to learn to integrate the intellectual capital of individual teachers into the collective knowledge base of the school, in order to prepare their pupils better for the future. Schools ought to be learning systems (Hargreaves, 2000; Leynse, 2000: 20v.). If schools want to keep up with the times, learning cannot be restricted to the classroom. School development requires collective learning processes.

Thus collective learning is important for the school development and the individual professional development. However, school development and professional development depend on one another. Views on innovation in schools have made clear that development and realisation of policy and reforms in schools need the professional development of teachers. On the other hand, these learning processes only turn out to be successful when they are supported by a development of the school as an organisation. Because professional development as reflection on the personal performance and the mental models or action theories applied, needs a learning process which is embedded in a reflective practice at school (e.g. Van den Berg & Vandenberghe 1999, Van den Berg,

Vandenberghe & Sleegers, 1999; Leithwood, Jantzi & Steinbach, 1999:194f.; Geijsel, 2001; Imants, 2001). Thus professional development and school development tend to be necessarily complementary processes. Processes of collective learning can serve the development of the school organisation and the professional development of the educational professionals simultaneously.

2. COLLECTIVE LEARNING - A FURTHER ANALYSIS

One can learn individually or collectively. Besides, there is a distinction to be made between the process and the outcome of learning (Simons and Ruiters, 2001; Simons, 2003); (see table 1). Simons and Ruiters (2001) allocate the definition of "collective learning" to learning in which both process and outcome are collective.

Table 1. Processes and outcome of learning (Simons & Ruiters, 2001)

Processes	Outcome	Individually	Collectively
Individual		Individual learning	Individual learning processes with collective outcome
Collective		Learning in social interaction	Collective learning

In this article the definition 'collective learning' is used in a less restricted sense: collective learning processes with individual outcome are also typified as a form of collective learning (also see note 1). The distinction between process and outcome clarifies that collective learning processes are not bound to result in individual outcome. According to Simons and Ruiters (2001) it is not imaginary that learning in workgroups or teams may lead to a lack of striving for collective outcome. One can think one learns collectively because the process is one of mutual interaction. Therefore, it is important to find out which intention is prominent in one's participation in collective learning processes. Learning can be mutual (collective process) with the intention or effect to develop one's own professionalism (individual outcome). Mutual learning can also be done in order to stimulate the further development of shared views of education, communal plans, etc.(both professional development and school development). In case of the latter it is a matter of collective outcome.

2.1. Collective learning : processes

Dixon (1994; 1999), following Kolbs reproduction of 'experiential learning', describes collective learning into four phases: (1) generating information all over the organisation, (2) integration of information within the organisational context, (3) collective interpretation of the information and (4) being authorised to act based on the interpreted meaning. The latter phase regenerates information and thus restarts the cycle.

Dixon illustrates these different phases with activities or processes based on a number of organisations that typify themselves as 'learning organisations'. These activities or processes can be implemented to increase the quality of the process of collective learning – considering the specific context of the organisation. To exemplify, a number of activities and processes occurring in these phases, are mentioned:

- Generating information all over the organisation: Particularly primary users collect information and ideas about processes and products from external and internal sources;

information is gathered by means of hypothetical questions (what will happen if we …I …the pupils…the methods…didactics…?); information is collected about complaints and errors.

- Integration of information within the organisational context means that everyone is informed about the others' data whereas the transfer of the information is timely, fully and accurately. Conditions such as openness and trust matter are important. Activities like cooperating with a colleague, introducing people to their jobs or counsel them, would integrate the stimulation of information.

- Collective interpretation of information aims to interpret collectively information which was collected and shared. This requires insight into interpretations which are given to the information by different people, not necessarily to attain similar interpretations but most certainly in order to decrease obscurities. This also requires conditions, such as equality and dialogue skills at organisational level.

- Being authorised to act based on the interpreted significance refer to act on the base of the shared interpretation. Authority to act like this is a requirement, but one must have also the authority to adjust the performance, if necessary, to the circumstances.

Nonaka & Takeuchi (1995) also emphasize the process of collective learning. They consider the creation of knowledge as a collective process of giving meaning to information, so particularly among people and not only inside the minds of people. Nonaka & Takeuchi distinguish four forms of knowledge conversion: from implicit knowledge to implicit knowledge (socialisation), from implicit knowledge to explicit knowledge (externalisation), from explicit knowledge to explicit knowledge (combination) and from explicit knowledge to implicit knowledge (internalisation). Collective learning (organisational knowledge creation) is a constant and dynamic interaction between implicit and explicit learning. This interaction takes place via the forms of knowledge conversion mentioned. Externalisation is looked upon as the core process in which the use of metaphors, analogies and models play an important part. Nonaka & Takeuchi (1995:83f.) distinguish five phases in the model of knowledge creation by an organisation: sharing of implicit knowledge, defining this knowledge (creation of concepts), valuation of those concepts for the organisation and the community: the application of knowledge in a prototype of a new product or service; and finally, distribution of knowledge to the other groups.

2.2. Collective learning: contents and results

The analyses of collective learning which were mentioned before, hardly say anythingabout the contents of learning. What (about what) is learned? To the background of the remarks about the significance and the vulnerability of practical knowledge it is useful to distinguish collective learning aimed at:

- The efficiency and effectiveness of performing to achieve certain objectives and to find more efficient and effective ways of performance (means-goal relation of performing);

- The interpretation of the situation, the research and possible adjustment of performance and the theories of action (mental models) behind this, the search for alternative interpretations of the situation and alternative conduct;

- The values which are implicit to the selected targets and practices; the valuation based on moral criteria of selected targets and practices.

This distinction is based on three knowledge interests, as distinguished by Habermas (1968; also see Van Manen, 1977). Following Habermas we can speak about the technical, practical and critical dimensions of collective learning.

Additional formal results of collective learning are mentioned by Leithwood (1998). He situates collective learning in the context of team learning and thinks that a member of a team should learn two things. On the one hand, a more or less shared understanding of the objectives of the team and the ways in which they can achieve these. On the other hand, what should be done on an individual basis to contribute to the collective learning of the team. It is Dixon as well who examines the results of collective learning, although she strongly emphasises the process. She distinguishes three kinds of outcome: changes to the knowledge of the members of the organisation, changes in the degree of the knowledge being collective and changes in the validity of the knowledge.

## 2.3. Collective learning: conditions

Several times it has been pointed out that there are conditions that could be stimulating for collective learning processes. Little research has been done in the field of collective learning and the conditions for collective learning are highly hypothetical and mainly based on analogies to individual learning and on experience (Bolhuis & Simons, 1999:133).

Much attention for the conditions of collective learning is to be found, not only in learning theory, but also in studies which aim at learning at the workplace, which, to an important degree, is collective learning (e.g. Onstenk, 1997; Bolhuis & Simons, 1999). Also recent theories on educational innovation, namely from the cultural-individual perspective which focuses on supportive conditions for the learning of teachers (e.g. Van den Berg, Vandenberghe & Sleegers (1999), pay attention to the conditions for collective learning. The most important conditions for collective learning at schools refer on the one hand to the learning capacities of a collectivity as a team: collective foreknowledge, views on learning, learning motivation and learning skills. On the other hand, perception of the situation and of te working environment of people concerned play a part: the perception of the context of the school, of organisational conditions in the school and of leadership (Verbiest, 2002). Especially transformative and shared leadership is of vital importance to the reinforcement of collective learning (Mulford, Silins & Leithwood, 2004).

Nonaka & Takeuchi (1995:74f.) also refer to a number of conditions which stimulate collective learning. For instance, the presence of an organisational vision which directs the process of knowledge creation; an abundance of information for those concerned and a creative chaos which stimulates the interaction with the environment.

The collective conditions, learning processes and results, mentioned before, can be presented in the model given below.

Figure 1. Model of collective learning
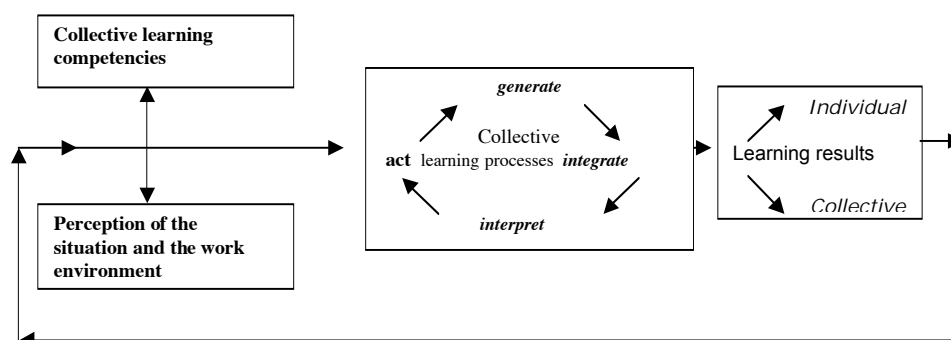
3. GENERAL PROBLEM AND RESEARCH QUESTIONS

Although schools are to be defined as learning-oriented organisations, it cannot be taken for granted that educational professionals learn collectively and learn from each other.

Characteristics of the phenomenon school, such as the isolated position of teachers, norms aimed against co-operation, dividing and sketchy goals, the specific use of time by teachers, the restricted autonomy of schools and its related conditions of employment, the prominent assumption of school learning to be transfer of knowledge, the diversity of clients (children, parents, further education, government) and the unclear mix of services and products (test results, social qualification, pedagogical guidance) do not simplify the development of schools as learning-orientated organisations. (Van Wieringen, 1993; Simons, 1997:50v.; Mulford, 1998:633f.; Lohman & Woolf, 2001). Co-operation between teachers and the realisation of distinct agreements, especially concerning classroom activities have not yet become current. Prevailing learning activities in secondary schools are those activities which can be performed by a teacher personally and which refer to his own teaching in contrast to co-operative activities or activities of a more reflective nature. With regard to reflection and co-operation of teaching, a variety of activities which are advocated in theory, cannot be traced back in the classroom. A range of activities do not seem to be optimised, such as joint preparatory lessons, observations during class visits, communal tests, exchange of material, discussions of new educational strategies, counselling of colleagues, joint reflections, contacts with groups of clients like parents (Reezigt, 1997; Kwakman, 1999). And in spite of increased scientific interest in practical knowledge, clarification of this phenomenon is hard to find (Kennedy, 1992; Zanting, Verloop & Vermunt, 2000; Edwards, 2001; Teune, 2004).

In this light it is essential to stimulate collective learning processes of teachers. Insight gained from the analysis of collective learning processes and of important determiners and effects of these learning processes can support schools and educational professionals in the further development of collective learning. In connection with this the following research questions were formulated[ii]:

1. What are the conditions for collective learning at school (according to the members of the team)?

2. Which recommendations can be made for the improvement of the conditions mentioned?

3. How do processes of collective learning with groups of teachers take place (according to them)?

4. Which part does a co-ordinator or school leader play in this (according to the members of the group)?

5. Which profits will be gained (according to the members of the group)? To what extent does collective learning apply to professional development?

6. Which recommendations for the improvement of collective learning can be made?

In order to answer these questions a research-project was carried out at a number of primary schools. In close co-operation with the school management and teachers, information was gained about the school and about their collective learning efforts. The information gained in this way and recommendations based on this was discussed with the school management and the teacher involved in the project, in view of the enhancement of collective learning at those schools.

The project lasted from September 2002 until December 2004. The first two questions be central in the initial phase (till about September 2003). The following phase was used for the

remaining questions. This paper will be restricted to the three schools which participated in the first phase as well as in the second phase. We go into question one and two only briefly (phase 1) and go more detailed into the remaining questions (phase 2).

4. PHASE 1: CONDITIONS FOR COLLECTIVE LEARNING

4.1. Design of the research

Initially, schools were selected to participate in the project. An important selection criterion was that each school would work at an innovative project. This project could be the starting point for collective learning processes. One school had been involved in the introduction of adaptive learning (independent learning) for some time. The two other schools had started off as so-called *professional development schools*. These are schools which co operate intensely with a teacher training institute, aimed at collective and mutual professional development of (potential) educational staff. Learning at the (future) workplace play an important part in this *professional development schools* (Kenniskring Schoolontwikkeling en schoolmanagement, 2003; Roelofs, 2002). At these schools collective learning processes of teachers also concern the training of student teachers.

The selection of schools implied some counter indications for the participation in the project.

One may think of a negative approach at school towards innovation in general or strongly conflicting relationships at school between members of the team or between the team and the school management.

During the first phase of the research, after contacting school and gearing mutual expectations between school and researchers, the following was realised:

- The general school situation was described (background information such as the size of the school, the school concept, and its history of innovation) (based on discussions with school management and analysis of documents);

- The perception of the innovation project at school by school management and members of the team was worked out: what is looked upon as the core, what has already been achieved, how do the participants experience the approach of the innovation project, what is difficult, what might be helpful? (interviews and questionnaires); (research questions 1 and 2);

- It was concluded how far the innovation project at school was institutionalised (questionnaire);

- The measuring of the perception of the members of the team concerning the conditions of collective learning at school (questionnaire); (research question 1)[iii].

4.2. Some results

Something can be said about the perception of the conditions of collective learning in these three schools (research question 1). As already stated, the perception of the members of the team of the conditions of collective learning in these schools was concluded by means of a questionnaire. It concerned seventeen different conditions. In the table on the next page average scores and the standard deviation on the different scales of three schools can be found. Moreover these scores of a large group (= reference group) on the various scales were stated[iv]. As the scores on a number of scales sometimes approached the averages of the reference group the percentile ranking score on the various scales of the three schools was also mentioned. This offers a more accurate indication of the significance of the

scores in relation to the reference group. Thus school 1 scores on *participation in decision-making* a little below the average of the reference group (3,1 respectively 3,32). However, over 70% of the schools of the reference group score higher than school 1.

The information which was collected during this phase was reported specifically for each school. Besides a number of recommendations were formulated (research question 2)

Based on this information schools were advised to organise groups of teachers (and in the two professional development schools to include in the group also student teachers) so that they realise collective learning processes. It was proposed to form small groups of teachers supervised by a co-ordinator or school manager. The way in which this collective learning could be embodied was described depending on the specific school situation. The report including the recommendations was discussed with the school management.

From the table it may be deduced that learning competencies are estimated relatively low by team members at school 1. The same applies to the conditions in the context of the school. The organisational conditions are just below average with the exception of *participation in decision-making*, which is estimated relatively low. Most conditions on leadership are estimated above average, with the exception of *care for people*. The learning competencies at school 2 are estimated above average, with the exception of *agreement of goal-orientation,* which is estimated relatively low and *skills to reflect collectively* which is estimated about mean. The conditions in the context of the school are estimated low. The organisational conditions are estimated above average, with the exception of *participation in decision-making*.

Table 2. Conditions of collective learning

Variables	Reference group		School 1 N = 25; n = 23			School 2 N = 41 ; n = 29			School 3ᵛ N = 27 ; n = 12		
	average	standard deviation	average	standard deviation	percentile rank score	average	standard deviation	percentile rank score	average	standard deviation	percentile rank score
Learning competencies											
Transparency of vision (4)	3,02	0,51	2,48	0,55	16	3,31	0,38	69	3,46	0,46	81
Agreement of goal-orientation(6)	4,44	0,68	3,48	0,45	10	3,96	0,45	22	4,24	0,38	34
Learn from work(4)	2,95	0,50	2,39	0,50	12	3,27	0,37	69	3,5	0,54	85
Skills to co-operate in educational matters (4)	3,33	0,50	3,02	0,60	36	3,66	0,41	67	3,67	0,46	67
Skills to reflect collectively (4)	3,04	0,62	2,49	0,72	14	3,02	0,65	58	3,44	0,36	70
Contextual and organisational conditions											
Context											
Involvement of the superintendence (4)	2,79	0,70	1,89	0,84	9	1,98	1,09	9	2,5	1,47	31
Relation with parents (4)	2,72	0,62	2,58	0,60	35	2,26	0,59	20	3,11	0,69	78
Organisation											
Professional support of colleagues(4)	2,74	0,49	2,73	0,51	47	3,62	0,50	96	3,63	0,35	96
Participation in decision-making (4)	3,32	0,48	3,1	0,48	29	3,04	0,41	27	3,61	0,36	70
Opportunity to co operate in educational matters (4)	2,63	0,63	2,54	0,73	42	2,91	0,59	69	2,91	0,64	69
Systematic goal-orientation (4)	2,96	0,67	2,89	0,55	44	3,14	0,44	59	3,14	0,52	59
Leadership											
Inspiring leadership (6)	4,40	0,96	4,48	0,56	49	4,43	0,59	48	4,85	0,55	69
Care for people (6)	4,77	0,84	4,38	0,64	27	4,62	0,45	41	5,38	0,49	83
Organisational efficiency 6)	4,32	0,89	4,6	0,48	60	4,14	0,62	47	4,91	0,72	74
Educational leadership(6)	4,11	0,97	4,61	0,58	67	4,3	0,54	55	4,77	0,59	78
Leadership: vision (4)	3,06	0,65	3,21	0,46	59	3,29	0,52	64	3,56	0,45	78
Leadership: intellectual challenge(4)	2,98	0,63	3,2	0,41	64	3,15	0,54	63	3,64	0,37	86

N = number of members of the school team n = number of questionnaires incorporated

(4) or (6): The variable was measured on a four point ranking scale respectively a six point ranking scale.

The conditions on leadership are estimated above average, with the exception of *care for people* and *organisational efficiency*. In school 3 all conditions are estimated above average, except for *agreement of goal-orientation* and *involvement of the superintendence*.

It may be said that the schools, as far as the conditions of collective learning are concerned, are perceived differently by the members of the teams. School 1 scores below average on 13 out of 17 conditions, whereas the percentile score on variables is under 50, with the exception of four conditions on leadership. School 3 scores above average, apart from a condition in the learning competence and a situational condition. Apart from these two conditions, all percentile ranking scores are above 65. School 2 occupies a place in between and scores above the average on most conditions (9 out of 17), although below-average scores occur in each group. Ten out of 17 percentile ranking scores are above 50.

5. PHASE 2: PROCESSES, RESULTS AND THE PART OF THE SCHOOL LEADER OR CO-ORDINATOR

5.1. Design of the research

In the second phase we tried to gain more insight into collective learning processes of the participating schools, with a view to enhancement. From the dual objective of improving and researching, we are particularly interested in the process of collective learning as well as in factors which may contribute to the improvement of that process, specifically the part of the school manager, and in the results of this process (research questions 3 to 6).

During the second phase each of the three schools formed a group of teachers who would learn together about some subject. The groups functioned for about three up to four months. We advised some tuition in advance for the participants of these groups in order to stimulate the process of collective learning. We also referred to the important part of the school leader for the guidance of the collective learning process. The culture of learning, the organisational conditions and leadership conditions could all benefit from this and thus be enhanced. Two schools started work without any guidance. In a third group (group 1) the principles of collective learning were discussed with the school leader. He was the only school leader who guided the group at school. The two groups in the remaining two schools were guided by a member of the management team.

The table 3 given below shows an indication of the different groups: the schools they work at, the subject they learned about and the number of group sessions in phase of the research.

Table 3. Overview of the different groups "Collective learning" and number of interviews

Group (School)	Subject	Size (number of pp)	Frequency of meetings	Number of people interviewed
1	Working independently	7	4	4
2	Thematic arithmetic in elementary classes	5	5	5
3	Working independently	5	5	5

In order to get an insight into the collective learning processes in the various groups individual, semi-structured interviews were held with a number of participants in each group.

Depending on the schools, these interviews took place 3 to 4 months after the start of the various group sessions. In total 14 people were interviewed (see table 3).

The interview questions are based on the analysis of collective learning as described before (see Figure 1). The conditions for collective learning had been investigated in the first phase of the research. In the second phase interview questions were asked about the various phases of collective learning, as described by Dixon (1999) and Nonaka & Takeuchi (1975). We also included a number of questions which refer to the contents of collective learning processes. Finally we asked for the outcomes of and the part of the school manager or co-ordinator in the process of collective learning.

The interviews were tape-recorded. They were summarised extensively, complete with literal quotations. A so-called "*template approach*" (Robson, 2002 :457 f.) was selected for the analysis of the interviews, in which key codes are used as a mould for the data analysis. The key codes were composed prior to the analyses of the texts. On the one hand this a priori composition of the codes was chosen to increase the comparability of the interviews. The use of a similar mould simplifies the comparison of various data of the members of the same group and those details of the various groups (schools). On the other hand this a priori assessment of the codes was selected to increase the opportunity to trace activities or the lack of activities which play an important part in collective learning processes.

The key codes have been assessed through a version of collective learning as mentioned before. In total there are 40 codes, excluding a number of sub-codes

An example of such a code follows:

Code 15:   Integration of information into the group related to

15a   technical aspects of the job

15b   practical aspects of the job

15c   critical aspects of the job

The various interviews were analysed according to the codes, relevant passages of texts were coded and ranked per code. In support of these qualitative analyses a quasi-statistical analysis was carried out (Robson, 2002:457). It has been determined how often a particular code occurred in an interview and by how many members of the group something was said which was coded in a particular way. Such information indicates the relative significance which is attributed to the diversity of activities and elements.

For the benefit of the feedback a specific form of data reduction was applied. Passages of text, belonging to a number of different codes, have been grouped. Based on the theoretical analyses of collective learning a number of categories and subcategories were used (see Table 4).

Table 3. Overview of categories and subcategories used in feedback to the schools

CATEGORIES	SUBCATEGORIES
Generating information	Variety of people who collect information Variety of sources used by members of the team to collect information Variety of subjects about which members of the team collect information Degree of systematic and constant collection of information at work by team members The way in which the co-ordinator or school manager played a part during this phase, according to interviewees
Integration of information	Degree of which team members spread information widely and fully within the group Variety of subjects on which the team members contribute information

	Extent to which team members define explicit knowledge by means of metaphors or analogies The way in which the co-ordinator or school manager played a part during this phase, according to interviewees
Collective interpretation of information	Extent to which team members strive for critical analysis and collective interpretation Variety of subjects on which the team members speak The way in which the co-ordinator or school manager played a part during this phase, according to the interviewees
Being able to act based on acquired insight	Degree to which team members act based on collectively shared interpretations and are authorised to do so Extent to which team members are authorised to make necessary alternations Extent to which team members collect and share information about this new acting (new cycle) The way in which the co-ordinator or school manager played a part, according to the interviewees
Outcome	Degree to which one has learned individually Degree to which one has learned collectively Degree of change in knowledge (interpretations) Extent to which there is a better co-operation and co-learning in the group among the team members Degree to which knowledge has been made explicit and systematised Alternation to which knowledge is collective Degree to which one has a shared understanding of the goals and the way in which they can be achieved Degree of alternations in validity of knowledge

In the feedback of the outcome of the questionnaires, one was asked initially for their expectations regarding the group work. Consequently, the results were submitted per phase.

This also offered the opportunity to clarify the background theoretical notions on collective learning, which were used in the presentation of the questions of the interviews and the analyses of the data. Group members were asked how the results mentioned, agreed to their experience of working in groups. Possibilities to improve collective learning processes of teachers were also discussed.

5.2. Results

Summarising, the following picture of collective learning in three groups of different schools can be described. Information was *generated* wide-spread in all groups concerned. Information in group 1 was gathered by the majority of group members. Information in the two remaining groups was collected by everyone. A diversity of sources was used, consisting of internal and external ones and formal and informal ones. Not all sources were used by everyone. For sources one may think of literature, information gained from colleagues, one's own experience, class visits to a colleague's class, error analyses and test scores, talks with children, internet, courses or workshops and visits to other schools. The enquiries were mainly restricted to technical subjects: how to achieve goals, how to use a certain method, how to teach writing to children, how to adapt time-management with independent working. Practical and critical information (about the aims as such, more implicit ways of thinking about education and implicit values) was hard to find. Somebody in group 3 explicitly reported that this kind of information was not collected. Only one individual in group 1 offered information of the practical and the critical dimension. The method of collecting information was not very systematic and the information was mainly gathered on one's own initiative and in one's own way. The co-ordinator of group 3 did collect systematically. Some members in this group made clear that they had no idea how others managed to collect information. The co-ordinator's part in this phase was mainly to spread selected information. In group 2 and group 3 (where the school leader was not the co-ordinator of the group), there was some influence of the school leader by propagating the vision of the school (school 2) or by bring in some literature and by discussing the process with the co-ordinator (group 3).

The main meaning of *Integrating* for the people in the groups was to inform the others: sharing experiences and listening to others. In group 2, there was a wide spread of information, without

restrictions, although one member said that she was not fully clear about the goal of the meetings. In the two other schools there were some restrictions in the integration of the information. In group 1 one do not spread the information to everybody. Some people in this group point out that a lot of information was spread outside the group. As a consequence, some people were ignorant of relevant information. There was the impression that some matters were arranged outside the group. In group 3 some people select the information before bringing in the information in the group. Especially information about what happens in the own class was filtered out. The co-ordinator of this group confirms this. According to here, it was owing to some fear for the consequences of the known information for the acting as a teacher in the future. The integration was restricted to the spread of technical information. In two groups (2 and 3) one try to record in a summarised way the information. The role of the co-ordinator in this phase was described by everybody as leading the conversation and stimulating participation. In group 3 the co-ordinator was seen also as somebody who bring in information from the management. For one person that means also that the co-ordinator was decisive in setting the agenda. In group 1, one saw the school leader also as the person who align the different ideas in the group.

Interpretation was described by almost everybody as the exchange of experiences and ideas. Sometimes integrating implied looking for a compromise (school 3). It did not often occur that information was investigated systematically. Some people in group 1 made clear that not everybody was straightforward. The subjects which were discussed were mainly of a technical nature. Nothing in the interviews of groups 2 and 3 referred to the sharing of information about the goals as such, or the more implicit way of thinking about education and implicit values. It was pointed out in group 1 that information on background educational views, subjective concepts and moral considerations, was exchanged. But, according to the interviewees concerned, this did not happen within the entire group: this was restricted to some participants. One member of this group also thought that the chosen theme did not live up to its promise. The co-ordinator's part in this phase was mainly defined by the participants as panel chairman: to conduct a discussion, provoke reactions, summarise, and involve every-one in the discussion. One individual looked upon the school leader in group 1 as someone who comprised ideas into a vision, whereas someone else thought the school leader should direct more. Some people in group 3, including the co-ordinator herself, described the part of co-ordinator as being rather controlling. This resulted into some friction, after which there was more space for a more open-minded exchange of thoughts. The school leaders who did not co-ordinate a group, were at a distance: they received the reports of the sessions.

Most participants indicated that they tried to *act* based on the insight acquired, but the degree to which this takes place, varies. Some people in group 1 pointed out that occasional changes of approach occurred based on the group discussions. But not everybody introduced these changes and it did not happen in the same way. The participants had their own freedom to act according to their own insight. It was an individual choice to implement the new ideas or leave them be. Some did not carry out the ideas because they "were not like them", because they did not fully back the ideas or because they were still looking for the right way of execution. Most participants in group 2 stated that they tried to act based on the insight achieved; though the remark was made by a participant that after discussion of the information which had been distributed, no action whatsoever followed. An individual in group 3 restricted acting based on acquired insight to "if I agree to someone's opinion". The majority of participants collected information about actions like these in order to have further discussions, but differences arose here, too. Almost everyone in groups 1 and 2 collected information. The school leader in group 1 collected the information by having a look around during the classes. Some group members of group 2 attended each other's classes to collect this information and

consequently discussed it. Some members in group 3 said they occasionally collected information. A member of this group only introduced experiences when he tried out external ideas, (e.g. colleague's ideas). However, he had no input about his own attempts to improve something. The co-ordinator in this group made the point that little use was made of the opportunities to observe colleagues at work in the classroom. The part of the co-ordinator in this phase has not been described very explicitly and ranges from informal talks to observation of the classroom situation. The co-ordinator in group 3 points out that she tries to organise the performance more systematically. This is confirmed by another member of the group. Some other group member in group 3 defined the part of the co-ordinator very pragmatically: organising the planning and ordering the materials needed.

The majority of participants in all groups reported individual *outcome*: insight into one's own performance and being aware of alternative possibilities to work in the classroom. Group members from various groups thought that the conversations in the group resulted in much insight into one's individual acting; or that the meetings and the discussion of a working plan led to the insight and application of alternative didactic possibilities in the classroom. Insight was gained into useable approaches by using the views of other members: people realised it could be done differently. Some members pointed out they thought more about the goal of their work and they were more aware of the theme concerned. It was also a matter of changes in knowledge or interpretations although this was not entirely due to the group work; other factors also came into this: television programmes, changes in society and literature.

Several teachers adapted their original ideas on account of the other members' input. It was put forward in group 1 that the acquired outcome mainly referred to subjects of a technical nature.

Collective learning results were recorded less extensively. Some members in group 1 made clear that the general attitude is one of "every man for himself", without a co-ordinated approach. The majority of group members in group 2 stated that there is more harmony. The majority of group members in group 3 described that their ideas have equalised more now and the pupils experience more continuity. Groups 2 and 3 also recorded outcome in the form of a better co-operation and co-learning. Some members in group 2 mentioned an increase in solidarity and teamwork. Some group members in group 3 stated there was a stronger tendency to ask for help and advice. The co-ordinator of this group also thought there was more unity in the team now. Results in groups 2 and 3 were put into writing. Group 1 only had the minutes of the sessions. Statements on alterations concerning the validity of the interpretations were not to be traced back in the interviews. All groups put forward there had been no clear effects for the school up till now.

Although there were differences of views on details regarding the record of the results, various group members wholeheartedly agreed to the report during the feedback. Furthermore it came to light during the feedback that the teachers and co-ordinators concerned know next to nothing of a method of working, such as one based on the Dixon (1999) model. They had never worked in a way like this in the school

6. CONCLUSIONS AND DISCUSSION

To start with, we formulate a number of conclusions in this paragraph related to research questions 3 up to 6. We also attempt to formulate some recommendations for the benefit of the reinforcement of collective learning. Preceding the formulation of the recommendations, we give a

moment's thought to a number of factors which may play a part in the course and outcome of collective learning in schools.

6.1. Processes, results and the part of the school leader or co-ordinator

In all groups the process of collective learning as described is recognisable in the different phases. But this does not mean that all activities which may contribute to collective learning in the various phases, will be realised. This definitely concerns the phases of integrating, interpreting and acting. Information is collected at quite large scale although without hardly any system. But the integration of the information in the collectivity and the collective interpretation of this information is largely restricted by a selective input of information (in groups 1 and 3) and by a restricted critical research of the information (in all groups). Furthermore the participants have a free choice to put the newly-acquired insight into practice or leave it be (in all groups). And as far as this happens, it refers to insight which was achieved based on restricted information and a restricted critical application of this information.

Furthermore we conclude that the contents of the collective learning process is almost exclusively restricted to the so-called technical dimensions (in all groups). It is hardly a matter of inquiring and adjusting of the performance and the underlying theories of acting and of the search for alternative interpretations of the situation and alternative behaviour. It is only a matter of finding more efficient and more effective ways of performing. There is no or hardly any matter of testing of the chosen goals and practices based on moral criteria. Almost no proof can be found for generating, integrating, interpreting or acting based on information and insight which expand to practical and critical dimensions.

The outcome of the collective learning process is mainly described as individual outcome.

The results are recorded rather detailed and mainly refer to the realisation of alternative didactic possibilities and the increased awareness of the personal performance and the the educational objectives. It seems to be the case that outcome has been achieved related to the practical dimension of the teaching job, without explicit mentioning of this in the group.

Also collective results are mentioned, especially in group 2 and 3. In particularly, it concerns a supposed growth of unity of ideas and better co-operation and co-learning. The collective character of these results is not discussed in the group and as far as the realisation of acquired insight is concerned, there is a strong individual diversity.

Kasl, Marsick & Dechant (1997) describe four levels of collective learning depending on the degree of critical sharing of information:

1. *Fragmented learning :* the individuals learn individually, the collectivity does not learn as a unity, the group members stick to their views, there is hardly any sharing of information, experimenting is done on individual level and not so on the level of the collectivity, there is little integration of views because these views are not shared and there is little interest for the views and information of other people;

2. *Co-learning* : subgroups of individuals start sharing information, particularly when they see a clear relation between the task they have to meet as a group, considerations of effectiveness and efficiency play a part in this; some integration of views takes place but as there is no open discussion on the differences of opinion, this does not frequently occur ; there is hardly any group experimenting left;

3. *Synergetic learning*: the members of the collectivity share information on request and spontaneously; there are integrated views, both on individual and collective level; there is much individual and collective experimenting and there is an open discussion about differences in views;

4. *Constant synergetic learning*: the way of learning mentioned before (synergetic learning) has become customary to the collectivity.

Although there are differences among the three groups and in the groups themselves, the collective learning which became visible in the various groups, based on the outcome mentioned and the related conclusions, is mainly to be situated on the second level. There was a start in sharing of information, but this does not occur in a synergetic way, considerations of effectiveness and efficiency play a part; there is some integration of views. However, there is little open discussion about differences of views which prevents further integration of views. With some caution it may be said that group 2 in particular, by sharing and discussing views more openly, moves towards level three.

The significance of collective learning was pointed out in the first and second paragraph. Collective learning is the key to professional learning communities. Collective critical reflection by teachers on their performance, their implicit practical knowledge and their views on good teaching, is important for school development and professional development. Not only the significance of collective learning processes was underlined, but also the significance of collective learning results. It may be concluded that the schools involved could improve both the conditions for collective learning and the collective learning processes in order to improve the results of collective learning (and the results for the pupils).

Contemplating the improvement of the quality of collective learning processes, it is useful to consider a number of conditions and factors which may play a role in the quality of collective learning, as we have come across. To begin with, some observations can be made on the relation between the perception of the conditions of collective learning on the one hand, and collective learning as we described in the interviews at the other hand. Considering the moderate number of group members that filled in the questionnaires, school/group 3 has not been taken into consideration.

As far as the process and outcome are concerned, collective learning is described more in group 2 than it is in group 1, according to the ideal type of collective learning as stated before. Group 1 turns out to have more restrictions in the field of sharing and interpreting information. Acting based on acquired insight is more restricted in group 1 than group 2. Moreover, more collective results are recorded in the latter group. The conditions of collective learning, as measured via the questionnaire, also differ in group 1 and 2. Learning competencies in group 1, in particular, are estimated lower than those ones in group 2. The learning competencies in group 1 are also low in comparison to the reference group, whereas the scores in group 2 approach the average of the reference group more. Most organisational conditions in school 2 also score higher than school 1 and the reference group[vi].

Thus there are indications that the quality of collective learning in schools varies with the conditions of collective learning, as mentioned before. This is very likely a matter of circular causality (e.g. professional support from colleagues stimulates collective learning, which consequently enhances the professional relationship among colleagues). However, it is advisable to pay attention to the improvement of the conditions in the reinforcement of collective learning in schools.

More specifically, for the schools concerned, a number of conditions needing focussed reinforcement can be mentioned. The execution of the process of collective learning points to the possibility to improve the conditions in which collective learning skills and motivational (why do we learn) and emotional (mutual trust) aspects play a part.

This concerns conditions (quoted examples from the questionnaire in brackets) like agreement of goal-orientation ('have the same opinion on what is important to the school'), learn from work ('to talk openly about different views'), skills to co-operate in educational matters ('to analyse a lesson into strong and weak points'), skills to reflect collectively ('able to reflect together') and, specifically in schools 1 and 3, professional support from colleagues ('get help from colleagues for questions and problems').

It cannot be excluded that the relatively low competence of the educational professionals concerned to learn collectively, is also influenced by a traditional learning conception. A learning conception is a relatively stable and coherent unity of views, convictions, (meta-)cognitions and affections in relation to learning: what is learning about, what is the best way to learn and what should be the purpose of learning or what must be the purpose of it (Schellings, Lodewijks and Van der Sanden, 1999). In a traditional learning conception learning is mainly looked upon as transfer of knowledge and reproduction (Bakx, 2001). From this learning conception collective learning can be considered to be an exchange (transfer) of information and experiences. Less importance is given to the personal practical knowledge and the critical research and improvement of this practical knowledge. This assumption is supported by studies which show that students often enrol in teacher training colleges whereas they have traditional learning conceptions which, besides, are difficult to change (Kennedy, 1999; Teune, 2004). Other studies make clear that mentors also tend to have rather traditional learning conceptions and often guide their students in traditional ways (Edwards, 2001; Teune, 2004). It is true that these studies concern secondary education in particular. But there are also some indications that primary school teachers still use a mainly traditional learning conception. It became clear from small research among four professional development schools (among which school 2 and 3) that the training of teachers is chiefly considered to be a matter of achieving practical experience and getting familiar with the vision of the school. They do not mention collective critical research and improvement of practical knowledge as part of learning and professional development (Verbiest c.s. 2004). When asked for the expectations towards working in groups as mentioned here, the group members concerned hardly showed any inclination for collective critical research of the practical and critical dimensions of a teacher's performance. They have little or no theoretical know-ledge or practical experience with collective learning.

By the way, reinforcement of learning at the place of work, as momentarily is put into practice in the so-called 'teacher training at school'' projects (in professional development schools), but without the necessary attention for practical knowledge of mentors and students which implicitly and importantly determines a teacher's performance, may lead to underestimation of this practical knowledge and theoretical knowledge in general (Tuomi-Gröhn & Engeström, 2003; Teune, 2004).

The presence of a former traditional learning conception may also influence the perception of learning conditions. From such a learning conception a skill like mutual reflection e.g., may be looked upon as an exchange of views, without much critical reflection on these views. The valuation of the skill experienced like this may vary from the perception from a learning conception which highly values personal practical knowledge and critical research and improvement of this practical knowledge. From this line of reasoning it is important to revise critically the significance of the

validity of the operationalisation of some variables, in particular those variables which refer to a learning conception.

Schools willing to reinforce collective learning need to pay attention to the conditions which influence this. Some training on collective learning is to be recommended. This training should focus on the concept and ratio of collective learning for the professional development of educational professionals and schools. Within this context the learning conceptions of those concerned should be a theme. School leaders can play an important part in this. Furthermore, it includes that training institutes of school leaders should also create enough room to achieve the concepts and skills related to collective learning and the guidance of these learning processes. Finally it is advisable for Teacher Training Colleges to pay attention to collective learning, both in a conceptual sense and in the focus on reinforcement of the required competencies. It seems as if the extraordinary attention for reflection currently noticeable in the training of teachers, is restricted to processes of individual reflection. It is also vital here to pay attention to learning conceptions of mentors and students.

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[i] Dixon (1994:5) defines collective learning as the intentional use of learning processes on individual, group and system levels in order to transform the organisation constantly in the direction chosen by those concerned. Dixon (1994:134f.) collected another ten definitions of *organisational learning*. The main similarities in all these definitions concern the link of increased knowledge to improved performance; the openness of the organisation to the environment; the idea of solidarity of collective thinking and a proactive attitude in the transformation of the organisation. Differences in definitions refer to the emphasis of the environment of the organisation versus the internal organisation; emphasis on adaptation versus proactive change; learning of individuals versus learning of bigger organisational units and emphasis on management versus members of all organisational levels as key figures of collective learning. According to Sun (2001:94) many definitions of *organisational learning* emphasize the process character of knowledge acquisition, aimed at better performance. Leithwood (1998:209f.) defines collective learning in terms of mutual adaptation of individuals and organisation.

[i] Huysman (2000:134) distinguishes two approaches of learning in organisations. The concept of the learning organisation matches an intervention approach, in which there is a strong focus on the management of learning in the organisation, in particular, on the results desired by the organisation. Organisational learning (collective learning) matches the process-approach in which the process of learning is the essence. Learning is inherent to the participation in a practice. The results of learning withdraw themselves from control by, the management e.g. Research into the intervention approach aims at the development of effective interventions for the reinforcement of learning. In the approach of the process research is aimed at theorising. In the concept of professional learning communities there is a certain integration of both views to be seen: from the description of the processes one also attempts to derive desirable characteristics of the organisation (Bakkenes, Vermunt and Wubbels, 2004).

[i] The questionnaire is an operationalisation of conditions for collective learning which were mentioned before. For a start, the questions concern the collective learning competencies: mutual foreknowledge (mutual vision and agreement in goal-orientation), learning conception (to consider work as a source for learning), learning motivation (show one's vulnerability) and learning skills (skills in collective learning and in carry out a dialogue). Furthermore, the questions concern the perception of the situation and the working environment of those concerned (support of the superintendent, relation with parents; professional support from colleagues; participation in decision-making, opportunity to learn collectively, methodical goal-orientation. Finally, there is a number of questions which refer to the perception of leadership: the school manager as the cultural architect and culture bearer, care for people, organisational efficiency, strategic feeling, vision, and intellectual challenging of members of the team. A number of these conditions were measured via questionnaires developed by Geijsel (2001),Vandenberghe, (1988) and Staessens (1991).

[i] These scores were calculated on basis of research of 114 schools. At least 50% of the total number of the team members at all the schools filled in the questionnaires. The calculation of the percentile ranking scores was also based on these data.

[i] Only 12 out of the 27 team members filled in the questionnaire. The reuslts form this school must be used with reservations.

[i] It is true that school 1 mostly scores higher on the leadership conditions than the reference group and on some of these conditions also higher than school 2, but because the school leader did not guide group 2 in school 2, a comparison between school 1 and school 2 on these conditions is not very useful.