

Differing colours of professional learning

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*The question we try to answer in this paper is whether we can develop a learning language (define colours of learning) that fulfil similar functions as the colours of change devised by de Caluwé and Vermaak. A conceptual system of five learning colours (five metaphors of learning) will be proposed. Metaphors of learning as defined for instance by Sfard are included in the system. Apart from her acquisition (blue) and participation (red) metaphor, three other metaphors are proposed: the meaning construction metaphor (white), the copying- the-art metaphor (yellow) and the experimentation metaphor (green). The blue colour of learning refers to transmission and acquisition. The yellow colour of learning focuses on observation and imitation. Red is the colour of participation and communication. The white learning theory emphasizes knowledge construction and understanding. Finally, the green theory is about experimentation and reflection. A questionnaire was devised consisting of ten components of learning 'laden'** on the five metaphors. Subjects for a pilot were 905 teachers, educational managers and support people attending a conference. Results pertain to the reliability and validity of the five learning colour scales. Some relations were found with function in the educational system, age, experience and educational level.*

Introduction

The need for professionals to learn, in order for organizations to compete, expand and innovate is something often described (Bolhuis and Simons, 1999). Training is known as the most widely used form to fulfil this need. Several question marks are placed as to the effectiveness of training (Simons, 1999). Knowing that there are different things to learn, different ways to learn and different contexts preferred to learn in by these professionals, it seems predictable that there cannot be only one way to organize this. So the effectiveness of training, being 10 %, 20 % or more, is not so much the question. The question is which other ways to learn add up to a complete picture. And how to choose a fitting and effective way of learning in a specific situation for a specific learner with a specific need.

Although in science and publications the number of distinctions in kinds of learning is growing, in everyday practice, new ways to organize learning find only limited resonance within management. Listening to HRD-professionals talking to management quite often sounds like a Babel-like confusion. In the eyes of both parties there is alienation. Well, be honest, these new 'learning-messages' are not easy to sell (for HRD) or understand (for non-HRD), take for example; organizing learning by 'not organizing' learning (implicit learning), or the 'complexity' of an action learning trajectory.

And besides the difficulty of understanding, as stated before; no one of these new forms proof to be effective for all employees, and all goals. As a result, disappointed in effectiveness of new forms and irritated by vagueness, operationalizing learning again or still comes down to subscribing employees to training.

In the end, there are still people participating in training, who would be better off observing a senior colleague or talking the problem over with a group of professionals. The resistance shown towards training is often turned down by a trainer or manager telling them: 'Everyone can learn something in a training', 'you get out of it, what you put in to it', or 'There is also an obligation to deliver'. But, let's ask our self; what is the final result of the investment for a training in these cases? How often is there awareness by HRD-advisors, trainers or management of the resistance to training, which becomes a resistance to learning, which in the long run hinders organisational development?

In our work with professionals, we experienced that in case of an explicit need to talk about learning, the everyday learning language is insufficient (for example in a conversation between a manager and an employee preparing a personal development

plan). Due to the limited distinctions made between different ways of learning, learning is often confused with training. When training doesn't fit the way of learning of an employee, difficulties in reaching developmental goals are a consequence. The limitations in learning language therefore are a basic barrier in finding a fitting way of learning for an employee in order to reach a developmental goal.

A similar language problem has been around for 'change'. We observed the effectiveness of the colours of change (a system of five types of thinking on change, by De Caluwé and Vermaak) in communicating about change and decided to develop a similar language for learning.

Our search, of which this paper testifies, is for a system of meaningful distinctions in ways to learn, in order to help professionals and their managers to talk about learning and determine smart and motivating ways to reach personal as well as organizational growth.

History of differing styles

In the literature, there are numerous theories and studies that focus on differences in learning strategies, learning styles and learning conceptions. Very popular is, for instance, Kolb's learning style approach (LSI), distinguishing four types of learning styles (diverger, accommodator, assimilator and converger) determined by two (supposedly) independent axes: concrete experience – abstract conceptualisation as the vertical axis and reflective observation and active experimentation as the horizontal dimension. Although Kolb's instrument is used a lot in practice, there are, in our view some problems with it, to name a few (see <http://reviewing.co.uk/research/experiential.learning.htm#2>: a) the instrument focuses on individual learning only and has no place for learning in social interactions or collective learning; b) the focus is on implicit learning only, leaving guided and self-directed learning aside, and c) Kolb's abstract conceptualisation would not be seen as a necessary part of the process of learning because it need not be explicit and declarative.

Although there are some variants on the Kolb instrument, such as the ones devised by Honey and Mumford (1982) and Juch (1983), the problems mentioned remain the same. Honey and Mumford, for instance, changed the Kolb approach in the direction of explicit learning, but they forgot about implicit learning.

Other popular approaches to differences in ways of learning focus on learning in educational settings. Examples are the approaches of Vermunt (1992), Entwistle and Ramsden (1983) and Schmeck (1983). Typically, differences in learning refer to deep, meaning oriented, holistic learning versus surface, fact oriented, and serial learning. Besides they distinguish preferences for self-directed and guided learning. These approaches have proven their value in educational settings. They are, in our view however, not very suited for use in work and life long learning contexts. Again there is little attention for learning from and with others, and implicit learning is neglected. The purpose of the research to be reported here is to device and study an instrument that is of use for work and life contexts. Its should focus on both implicit and explicit learning, on both individual learning and on learning from and with others and on self-directed as well as on guided learning.

Where should one start? What are important dimensions to focus on? We decided to take two tracks. On the one hand we looked in the literature for important distinctions in ways of learning (on and off the job). On the other hand we contrasted with the colours of change by De Caluwé and Vermaak. We then propose our system of five metaphors.

Distinctions in ways of learning made in literature

"Theories of learning, like all scientific theories, come and go. Some innovations reach deeper than others. Occasionally, theoretical changes amount to a conceptual upheaval. This is what seems to be happening right now in the research on learning.(...) The recent discussions (...) brings the controversial nature of current theories of learning into full relief. (...) To be able to embrace the whole issue at glance, one has to reach for the most fundamental, primary levels of our thinking and bring to the open the tacit assumptions and beliefs that guide us." (Sfard, 1998)

The existing differences in views between theories are a powerful help in our search for fundamental different views on learning. They help us find the metaphors we are looking for. In this paragraph we explore these fundamental differences.

In her article, on two metaphors for learning and the danger of choosing just one, Anna Sfard (1998) delivers us a first distinction, the one between the acquisition and the participation metaphor. Learning as the acquisition of something is probably the most common view on learning. The Oxford Reference dictionary refers to learning as 'knowledge acquired by study'.

According to Bruner (1996) the basic assumptions of the acquisition metaphor are that

- a) knowledge of the world is treated as the objective truth that can be transmitted from one person to another;
- b) a medium, such as a teacher or a book is needed to transport the knowledge of the one person who "knows" to an other person who does not;
- c) learning has to be institutionalised in a building (school).

The alternative assumptions of the participation metaphor (Sfard, 1998) state that

- a) there is no objective truth and knowledge is constructed in social-interactions between people;
- b) learning should be done by people themselves; at most they can be helped with this; we cannot do it for them;
- c) learning is gradually becoming a member of a community of practice (or a culture, or a profession, or a field of science); this happens for an important part outside of institutions and tacit knowledge and skills play important roles in it.

The participation metaphor examines learning as a process of participation in various cultural practices and shared learning activities. The focus is on activities and not so much on outcomes or products of learning. Knowledge does not exist either in a world of its own or in individual minds but is an aspect of participation in cultural practices (Brown, Collins, & Duguid, 1989; Lave, 1988; Lave & Wenger, 1991). Cognition and knowing are distributed over individuals and their environments, and learning is "situated" in relations and networks of distributed activities of participation. Knowledge and knowing cannot be separated from situations where they are used or where they take place. Learning is a matter of participation in practices, enculturation or legitimate peripheral participation (Lave & Wenger, 1991). Keywords are discourse, interaction, activity, and participation.

Secondly, Paavola, Lipponen, & Hakkarainen (in press) argued convincingly, that the distinction between the acquisition metaphor and the participation metaphor should be supplemented with a third metaphor: the knowledge creation metaphor. They base this on an analysis of three recent theories of knowledge creation, the ones from Engeström (1999), Bereiter (2002) and by Nonaka and Takeuchi (1995). These three theories share, so they argue, six common characteristics that are different from the acquisition and the participation metaphor. A) Learning is understood broadly to involve knowledge advancement in general. In all these models, dynamics of knowledge creation and the pursuit of newness is a focal starting point. B) They focus on bringing *mediating* elements to the process of knowledge creation, such as questions and questioning. In trying to capture the dynamic processes of innovative learning and knowledge advancement mediating elements, questions and various disturbances instigate cycles of innovation. C) Learning is fundamentally social: new ideas grow between individuals and not within individuals. Communities play important roles in knowledge creation. D) Yet individuals play important roles as instigators of innovation. Analysis of individual tacit knowledge is for instance an important start for innovation. E) Tacit knowledge is an essential resource of creative experts. And F) There is a focus on conceptual and theoretical modelling, using symbols and externalisation of tacit knowledge and theory. This theorizing and conceptualising goes with risk-taking, uncertainty, looking for new and promising ways, etc. The focus in the knowledge creation metaphor is on deep understanding and meaning construction, comparable to deep meaning oriented approaches as described in the educational learning styles approaches mentioned above e.g. Vermunt, 1992). In work environments, however, the focus will not so much be on explicit planned and pre-organized learning, but on the processes of innovation and the construction of meaning. Because of the different connotation practice has on 'creation', we call this the 'meaning construction metaphor'.

Thirdly, in our view, there is a need for a metaphor of what Meggison (1996) calls 'emergent' learning, learning not planned in advance, that is much pre-dominant in management learning.

Van der Sluis (2000) describes learning styles of managers that can differ according to two dimensions: before or after learning and focus on learning or performance. These two axes define 4 learning styles: meaning oriented learning, planned learning, emergent learning and instruction oriented learning. Van den Berg and Poeli (2002) describe a study that showed that managers reported to learn mainly from apparently impossible assignments, failures and disappointment, role models, conflicting norms and values, collaboration with employees, personal problems and power politics (pressure from above and below in a political environment).

In our view the main differing focus of this emergent learning is that it occurs mainly through modelling and imitation. Thus, there is a fourth metaphor, which we call the copying-the-art-metaphor, of learning in rather implicit ways from other people through observation and imitation and in practice where one encounters problems and disappointment (see Bolhuis and Simons, 1999).

Finally, we believe that there is a metaphor of learning that resides more in the learning organisation (Senge, 1990) and critical reflection (Freire, 1971) literature.

In learning organisations, not only the organisation as such and the teams in it, but also or even especially the individuals should work on their learning abilities. If individual employees have high learning abilities, the organisation can change quicker than competitive organisations. Senge (1990) proposed five dimensions that together create the ability to learn as individuals and as an organisation. The fifth one is the most fundamental because it underlies all the others. Therefore he called his book "The fifth discipline".

1. Personal mastery: Employees should have a goal-directedness in their work and life and should be ready to learn and develop (as a professional).
2. Shared vision: employees should be able and ready to share the organisational vision. They should be and feel involved in organisational goal(s) subscribed by all.
3. Team learning: employees should be able to learn in teams and as teams.
4. Mental models: people should be able and ready to make unspoken assumptions and norms public and available for others.
5. System thinking: people should be able and ready to think in wholes and in relations by reflecting on the system and all its subsystems. When learning and thinking they should consider the consequences for the whole system.

Especially, the fourth discipline (mental models) relates to critical theory, focussing on critical reflection.

The thoughts on critical and reflective aspects of learning are also emphasized by Van Woerkom (2002) and Freires' critical learning theory (Simons and Bolhuis, in press; McLaren, 1999). Van Woerkom (2002) defined 8 characteristics of critical reflection which are in line with the basic thoughts of Senge: reflection, career awareness, learning from mistakes, sharing critical opinions, challenging group thinking, asking for feedback, experimentation and knowledge sharing.

In Freire's view, there is no liberation without transforming practice ('praxis'). Individual and social learning are closely interwoven. Learning in socialisation, as well as the raising of critical consciousness and transforming practice, are not primarily an individual pursuit, but a collaborative process and action.

McLaren, 1999) summarised six learning principles from Freire's work:

1. The world must be approached as something to be understood by the efforts of the learners themselves, grounded in their own experiences, needs, circumstances, and dreams.
2. The world must be approached as a historical and cultural world, being shaped by human deed in accordance with their views of reality.
3. Learners must learn how to actively connect their own lives with the making of reality that has occurred to date.
4. They must learn to consider the possibility of 'new makings' of reality, as a collective, shared, social enterprise.
5. In literacy projects, learners come to understand the potency of print for this shared project.
6. Learners come to understand how the myths of dominant discourses oppress and marginalize them, and how they can transcend these myths and change them.

The fifth learning metaphor, which we call the experimentation metaphor, thus focuses on learning abilities and critical reflection with an active role of the learner who is consciously learning in collaboration with others in order to be able to function in a learning organisation or in order to emancipate.

All in all, we believe that we could deduce from the literature five metaphors of learning: the acquisition metaphor, the participation metaphor, the meaning construction metaphor, the copying the art metaphor and the experimentation metaphor.

Learning and change

Was the first approach to deduce metaphors out of literature on learning, the second approach was to find connections between ways to change and ways to learn. We took a recent book by De Caluwe and Vermaak (1999) as point of departure. In their book they defined five different, implicit theories of change. The most well known theory about change is the *blueprinting* metaphor. The blueprinting idea about organisational change is that organisations or persons change when there are clear goals and clear structures so that everybody really knows where to go to and how to define and operationalise it. But this doesn't create commitments and it creates opposition. What different ways to change are there, so they asked themselves when studying the literature? They organized the ways to think and talk about change in four additional colours. The *yellow* theory is that people and organisations change through coalitions and political force. The yellow way is using power and influence. An organisation changes by forcing people to do things, by organising consortia, by influencing people who will do it. The *red* theory of change is that people and organisations change when there is a supporting and rewarding climate. It is in terms of rewards, in terms of atmosphere. An organisation will change if people have a good feeling, if the climate is good and they get something more out of it, they get more money or more recognition. It focuses on social cohesion and collaboration. The *white* theory focuses on inspiration and flow: people and organisations change in dynamic open situations. The white way is often called the chaos theory. It's a bottom up approach. If you want to change an organisation you have to leave room for people to bring in their own ideas, and give them rights to influence their situation and to develop the ideas from bottom up. If you want to change an organisation don't come with ideas and don't bring anything but leave people room to change in their own way.

The *green* theory is the learning perspective: people and organisations change when learning (ability) is supported and facilitated. The green way is the learning way, it is the idea that an organisation changes when a long-term perspective is taken and a focus on learning abilities of people, as well as learning abilities of the organisation. stimulate the people to be life-long learner.

A basic assumption of De Caluwé and Vermaak in their book is that we need a language to talk about change. Their colour-language proves to work, so is our experience. People recognize the five colours easily and start to think in terms of the change colours almost immediately. It is a new language that helps them to understand their own views about change, their organisations' views and the discrepancy between the two. Furthermore, the colours help people to explicate their implicit mental models about change.

Combining the two approaches

In working with these five colours of change, we encountered often questions about learning in relation to change. Is learning really only *green*?

Could we find parallel learning colours that match the change colours? In experimenting on devising a learning language, we were interested in bridging the colours of change and our metaphors. So what we did was, we took a typical professional in mind of which we knew the change colour (for instance a certain colleague with an outspoken blueprinting vision of change was taken as the example) from which we could deduce a blue learning colour, and asked our self if there was a match with our metaphors?

This finger exercise (matching the five metaphors deduced from the literature and the five colours of change with observations of learning of professionals) provided a meaningful way of deepening and sharpening the metaphors into a logical learning language.

Then what do the five metaphors/colours of learning look like in practice?

Yellow – Copying the art metaphor

“Not everyone learns in the same way and not everyone learns under the same conditions. Even the assumption that you can only learn in a peaceful and harmonious atmosphere does not hold true for everyone. Yellow oriented learners learn well under pressure. They learn best in a hectic, relatively unpredictable and constantly changing work environment. They look for situations that will teach them something. They often have a talent for spotting an expert in a particular field and learn by example and good observation. They are very interested in tales concerning best practise and what works. It is probably obvious that yellow learners are not exactly keen on situations involving role-play and exercises. They will soon come to regard this as ‘childish’. They prefer to learn in the real world (instead of a learning world) where they are challenged to perform and achieve in a complex environment. Part of the challenge here is to avoid mistakes or to turn a disadvantage into an advantage.”

Red – participation metaphor

“In the past, learning was often regarded as a solitary process. Increasingly, however, the social side of learning is being emphasised. You learn with and from each other. Knowledge is not an objective concept, everyone has their own interpretation of what it is, but by communicating with others you can arrive at a joint meaning.

We typify people who learn best with others as red learners. They learn by participating and communicating. Interaction is essential to them. They need the cut and thrust of discussion to sharpen and clarify their ideas. You are forced to explain your thought, which, in turn, gives you feedback in the form of reactions and ideas from others. Win-win situations all round.

Learning is easiest for red learners within a group where the members are interested in and trust each other. There is strength in numbers and you can avoid mistakes.

Support in the form of a team coach can be useful, someone who can guide the group process. But members dividing tasks within the group themselves and rotating chairmanship are a good alternative. “

Blue – acquisition metaphor

Although many trainers and teachers are trying to find ways to bring theory and practise closer together and to escape the restraints of the classical system, there are people who really prefer this way of learning. They attach great importance to the transfer of knowledge and the learning of skills. They often learn well when goals are set and learning processes are defined. They like to be taught by ‘experts’, teachers who know their subject. After all, knowledge is objective and it is important to gain knowledge in an unsullied environment. Mistakes should be avoided. Making them is a sign of planning errors, sloppy preparation or inadequate knowledge.

Blue learners know what they want to learn and target their learning to achieving a concrete result. Regular testing is part of this learning process. After all, knowledge can be measured. Examination results give a clear indication to what extent the result has been achieved.

Green – experimentation metaphor

Together with blue, green is perhaps the most well known learning colour. Time and time again, green seeks to bring learning closer to the work place, consider on-the-job training, work experience and role-play. The greatest concern is whether that learned can be applied in practise. For this reason, wherever possible training is carried out in realistic situations, situations that reflect every-day practise as closely as possible.

The core of this approach is that it is a ‘learning situation’. This means that the environment must feel safe enough to dare to make mistakes in and be

uncluttered enough not to detract students from their primary goal. Moreover, it must be peaceful enough to allow students to reflect on what they have learned. In short, learning requires a peaceful, safe, not too complex, but realistic environment where students have the freedom to experiment, ask questions and have the opportunity to reflect. Learning can be supervised by someone from the work environment or an experienced teacher. The important thing is to have someone who can simplify situations, point things out or can pass things on that will bring you a step closer to your goal. With him, you can also discuss mistakes, because mistakes contain a wealth of information that help you learn.

White – meaning construction metaphor

White oriented learning is based on the premise that life and learning are synonymous. You don't just learn during a course, you are always learning. There is no such thing as not learning. Learning means finding your way through and understanding situations. Being conscious of this teaches you a great deal about daily life and those unexpected events that confront us all. An important prerequisite is a large degree of freedom. White learners like to go their own way. This doesn't necessarily have to be the most efficient path, as long as it's the most interesting one. The white learner searches for inspiration and meaning and finds these in his or her environment, friends and the people around him or her etc. Knowledge is what you yourself construct. The white learner doesn't really require their learning process to be supervised, but an inspirational 'teacher' or 'supervisor' will be taken seriously. White learners are often recognised by their creative drive and their urge to discover things for themselves. Initially, they can appear to be chaotic. But mistakes are all part of the game and keep you alert. If something takes too much time and effort you know you have to try another tack.

Table 1 summarises the colours, metaphors and key words.

Table 1: summary of metaphors and colours

Colour	Metaphor	Key words
Blue Learning	Acquisition metaphor	Objective facts, transmission, knowledge, from experts, explicit learning
Red Learning	Participation metaphor	Dialogue, with others, enculturation, collaboration, discourse
Yellow Learning	Copying the art metaphor	Role models, imitation form, best-practice, real-life, pressure, competition
White Learning	Meaning construction metaphor	Meaning, deep understanding, inspiration, design based learning
Green Learning	Experimentation metaphor	Critical reflection, safe, experimentation, emancipation, explicit learning

Sharpening the five metaphors

One final addition to our system was that we tried to define ten different components / aspects on which learning metaphors could differ. Not that we expected all five colours to be without any overlap on all these dimensions. No, on the contrary, we looked for possible overlap between the colours and metaphors. We considered the five colours to be metaphorical in a true sense, meaning that they had a holistic nature with various kinds of overlap on dimensions of learning (Blue and green overlap, for instance, in their emphasis on explicit learning. Red, and green overlap in their focus on learning with others in a good climate. Yellow and white overlap in their focus on complexity and real life, etc. Table 2 presents the differences and overlap.

The ten components we deduced from the literature and practice were: a) situations in which one learns; b) learning with others; c) dealing with mistakes; d) the role of emotions; e) from whom do you learn; f) what is knowledge; g) acquiring knowledge; h) guidance; i) where learning takes place; j) why learning. (see appendix A for the results of this exercise).

Table 2: overlap and differences between colours

	<i>overlap</i>	<i>difference</i>
<i>Yellow and Red</i>	the need for others	observing versus participating
<i>Yellow and Blue</i>	focus on goals, results	experience or expertise
<i>Yellow and Green</i>	respecting experience	tension / complexity versus safety / transparency
<i>Yellow and White</i>	learning in the real world	goal oriented versus free flow
<i>Red and Blue</i>	avoid mistakes	process versus content
<i>Red and Green</i>	safety and trust	collective learning versus learning with others
<i>Red and White</i>	importance of meaning construction	collective meaning versus personal meaning
<i>Blue and Green</i>	explicit focus on learning	knowledge versus experience
<i>Blue and White</i>	focus on content	objectivity versus subjectivity of knowledge
<i>Green and White</i>	focus on personal growth	guided versus self-directed

Research questions

This is the first in a series of empirical studies with the learning colour instrument devised on the base of the theory described above. It aims to find information about the reliability, validity and face validity of the instrument as well as to find suggestions for improvement of the instrument and the theory behind it. The study reported here tries to find answers to the following questions:

- a) Are the five learning colour scales reliable?
- b) What are the dominant learning colours of people in an educational setting?
- c) Are there meaningful relations between the learning colours and function in the organisation, age, experience and educational level?
- d) How can the theory and the scales be improved?

Method

Subjects

In total 923 people from 39 elementary schools and related organizations in Eindhoven who will attend a conference in the fall of 2003 participated in the study. 872 questionnaires proved to be usable (see below). There were 92 managers, 715 teachers, 33 support people (counsellors, ict support) and 42 with other functions (parents, researchers, outsiders, etc). The ages ranged from 20 – 65 and experience from 0 – 40 years. 48 had a university degree, 746 had a degree in higher professional education and 64 had middle or lower education as highest degree.

Materials

A questionnaire was developed in several circles of test and change. Experts were asked to look at the formulation of the questionnaire. Moreover, they were asked to help us find typical learning styles that match the change colours of which they had knowledge. The test had one question per component (see above) with 4 alternatives per question. One alternative loaded on two of the colours. This was done in order to give room for the overlap between the colours as described. Respondents had to divide 7 points over the four alternatives. They could give all 7 points to one alternative or divide in other ways such as 5 2 0 0, 0 0 4 3, 0 3 3 1, 1 1 4 1, 2 1 2 2, etc. The points given to the overlapping alternative counted for both colours. At the end of the form respondents could see the scores for the five colours in percentages. The first question was for instance “in which situations do you learn best?”. The four alternatives were: When there are clear goals and structure (blue), During inspirational meetings with others (red, white), In complex situations and under pressure (yellow), In a conducive learning environment (green). Participants were furthermore asked to answer questions about their function in the organisation, the school they work for, their age, their years of experience and their

highest educational degree. Finally they were asked to choose their preferred saying, choosing between a) Two heads are better than one; b) Knowledge is power; c) Practise makes perfect; d) Life is learning; e) Go and teach.

Procedure

All participants of a conference were obliged to fill in an internet version of a 10-item questionnaire. It was presented as an aid to find out which sessions were fitting their learning preferences (the sessions where also colour-coded). People who answered all questions with the fixed pattern 7 0 0 0 or 4 3 0 0 were removed from the data set.

Data-analysis

In a first reliability analysis the scales had disappointing low values. We thought that this could have to do with the dependency between the alternatives introduced by the division of 7 points over the alternatives. Therefore, we recoded the values in such a way that a kind of non-relational scoring was introduced. This was done as follows: All zero's stayed zero, because the meaning of this was clear; 'I do not recognize or use this item'. All highest scores where coded 4. If there was one more choice made, this became 3. If there were 2 more choices, these became 2. So a pattern like 5110 became 4220, patterns with 2221 became 4443 and patterns with 3310 became 4430. Now the reliabilities were better (see below). The analyses pertained to Oneway Anova's and Pearson correlations.

Results

Experiences with the learning colours in previous settings proved that people recognize their profiles and that they find it quite easy to answer the questions.

After the recoding of the variables as described above, as a first step, we created five scales with acceptable coefficients alpha. For each of the scales we had to leave out one item (the one with the lowest (often negative) item rest correlation. The resulting alpha' are presented in Table 3. They range from .50 to .64.

Table 3: Alpha coefficients for the five colour scales

	Number of items	Alpha
Yellow	9	.57
Red	9	.55
Blue	9	.64
Green	9	.52
White	9	.50

Then, we looked at the average scores on the five colour scales for the total sample (see Table 4). In this work environment in and around elementary schools, there was a dominance of the red (dialogue and collaboration) and the green experimentation and explicit learning) colours, whereas the scores on the yellow scale (learning from superiors and under pressure) were rather low.

Table 4: Means and Standard deviations for the five colours

	N	Mean	Sd.
Yellow	872	14,78	6,32
Red	872	23,10	6,09
Blue	872	19,56	6,92
Green	872	23,88	5,82
White	872	20,73	5,74

Table 5 presents the correlations between the learning colour scales and with age and experience. The colours correlate moderately, but significant with each other. We consider these correlations to be not too high. There are negative correlations between age and experience with Yellow and Green and positive with Blue. The older and more experienced people are, the more they choose blue and the less they choose yellow and green. Although these correlations with age and experience are significant, their absolute values are rather low (around .10).

Table 5: Correlations between the colours and age and experience

	Age	Experience	Yellow	Red	Blue	Green	White
Age	-	,81**	-,11**	,03	,09**	-,11**	-,06
Experience		-	-,09*	,04	,10**	-,07*	-,03
Yellow			-	,28**	,45**	,33**	,53**
Red				-	,21**	,36**	,33**
Blue					-	,39**	,22**
Green						-	,21**
White							-

** significant at the 0.01 level (2-tailed).

* significant at the 0.05 level (2-tailed).

Next we looked for differences between the colour scores as depending on the educational level of the respondents (see Table 6). There were significant differences for Yellow ($F=4,208$; $p=,02$) and Green ($F=3,072$; $p<,05$). People with a university degree scored higher on yellow than the other two groups. The higher the educational level, the lower the scores on green were.

Table 6: Differences between educational levels and the colours (Oneway Anova)

		N	Mean	Sd.	F	Sig.
Yellow	University	48	16,63	5,73	4,208	,02
	Higher professional	746	14,83	6,32		
	Middle	64	13,16	6,36		
	Total	858	14,81	6,32		
Red	University	48	21,40	6,62	2,029	,13
	Higher professional	746	23,22	6,10		
	Middle	64	23,19	5,51		
	Total	858	23,11	6,09		
Blue	University	48	18,65	6,72	2,317	,10
	Higher professional	746	19,76	6,87		
	Middle	64	18,03	7,14		
	Total	858	19,57	6,89		
Green	University	48	22,81	5,80	3,072	,05
	Higher professional	746	23,82	5,86		
	Middle	64	25,41	5,04		
	Total	858	23,88	5,81		
White	University	48	20,75	5,51	,742	,48
	Higher professional	746	20,86	5,66		
	Middle	64	19,95	6,28		
	Total	858	20,78	5,70		

Table 7 presents the results of comparisons between functions in the educational organizations (educational management, teacher and support people). There were significant differences for Green ($F=5,025$; $p=.007$) and White ($F=3,506$; $p=.03$). Managers scored higher on white and lower on green than the other two groups.

Table 7: Differences between functions and the colours (Oneway ANOVA)

		N	Mean	Sd.	F	Sig.
Yellow	management	92	15,04	6,16	,121	,89
	teachers	715	14,70	6,33		
	support	33	14,79	7,01		
	Total	840	14,74	6,33		
Red	management	92	22,58	6,78	,402	,67
	teachers	715	23,10	6,05		
	support	33	23,55	6,83		
	Total	840	23,06	6,16		
Blue	management	92	18,76	6,75	1,347	,26
	teachers	715	19,54	6,91		
	support	33	21,03	7,30		
	Total	840	19,51	6,91		
Green	management	92	22,13	6,11	5,025	,007
	teachers	715	24,15	5,78		
	support	33	23,36	6,31		
	Total	840	23,90	5,87		

White	management	92	22,15	5,34	3,506	,03
	teachers	715	20,49	5,81		
	support	33	20,21	5,45		
	Total	840	20,66	5,76		

Finally, we compared the scores of people along their preferred sayings (Table 8). Four out of the five comparisons were significant statistically. The results for yellow were the only not significant ones. As can be seen from the bold / italic means, the highest scores were for the sayings that matched the colour. Thus for red this was “two heads are better than one”, for Blue “Go and teach”; for Green “Practice makes perfect” and for white “life is learning”

Table 8: The mean colour scores of people with their preferred sayings (One-way ANOVA)

Sayings	N	Yellow	Red	Blue	Green	White
<i>Two heads are better than one</i>	201	15,18	24,87	19,89	23,44	20,23
	28	14,61	20,86	21,93	22,36	19,11
<i>Knowledge is power</i>						
	169	15,28	22,58	20,72	25,21	20,51
<i>Practise makes perfect</i>						
	380	14,62	22,57	18,81	23,39	21,49
<i>Life is learning</i>						
	16	16,63	23,19	23,50	23,69	19,94
<i>Go and teach</i>						
Total	794	14,94	23,11	19,69	23,76	20,85
F		,75	6,28	4,62	3,59	2,77
Sig		,56	,00	,00	,01	,03

Note: Bold italic are the expected highest means per row

Conclusions an Discussion

From the results of our first pilot we may conclude that learning colours can be measured in a fairly reliable way. We obtained after recoding moderate coefficients alpha. Moreover, there were intelligible outcomes. The dominant scores for the whole group were as could be expected. It seems logical that teachers and other people working in Dutch elementary education score predominantly Green and Red. The dominant culture is about collaboration and experimentation when learning on the job is at stake. The correlations with age and experience were not expected but can be explained easily. Younger and less experienced teachers score higher on green and yellow but lower on blue. Is this the enthusiasm of the younger teachers and managers who still believe in learning from and in practice (Green)? Do older and wiser people believe less in learning from superiors and under stress?

The differences between educational levels are also interpretable: higher educated people scored higher on Yellow and lower on Green than the other groups. Moreover, also the differences between managers, teachers and support people are as could be expected. Managers scored higher on White and lower on Green than teachers and support people. White is the colour of people who focus on construction of meaning in the work context

without much eye for explicit learning (managers). Green is the “learning” colour: focus on explicit learning and experimentation in practice (teachers). Finally, the differences between the sayings fit well in the theoretical expectations (except for Yellow). The saying “life is learning” proved to be too popular and should be replaced by another. Moreover we need to find a better saying for Yellow.

the instrument

Although there are promising signs in the data, they give directions for improvement.; items can be improved or skipped. Some formulations can certainly be improved now we know more. What especially needs to be changed in the next version of the questionnaire is the way of scoring. The division of 7 points over 4 alternatives introduced strange dependencies that had an high impact on reliabilities. In the next version we will have to ask people to rate all the items on for example a four-point scale.

We may conclude that there are some promising signs that it is possible to develop a learning language including five learning colours, but that we need improve our instrument a step further.

the practice

In practice, using the colours of learning proofs to be an effective aid in taking about learning. Next to gathering data to research our ideas, we also experimented with applications in practice.

We, for example asked people we had guided in their learning for two years to fill in the questionnaire. The results were congruent with what we had seen, and what the participants had experienced. For example high on blue (acquisition) for people with a need for knowledge. High on green (experimentation) for people who made an issue out of the safety in the group, while participants with a high score on yellow (copying the art) on the contrary wanted the feed-back sharper and the atmosphere less ‘nice’. The yellow-learners wanted more experienced colleges to come in and talk about their best practices, while the green learners didn’t want to listen, but try out things them selves.

The first time we used this instrument was in a less descriptive and more active way was in response to a request of HRD-professionals of a large international organization. They were wondering how to respond to a manager who didn’t feel like participating in an organization wide MD-program. This not participating was a big issue. The manager was criticised for not being ‘willing to learn’. ‘How can he tell us that he can not learn anything in this management development program?’. The colours of learning test was one of the instruments we used to pinpoint the preferred way of learning of this manager. A high score on white and yellow and a low score on red and green explained his attitude. For him an MD-program wasn’t the real-thing. What ever they would learn, in real life things would be different and the lessons learned wouldn’t be applicable. Putting his reflections in perspective to the other colours took a lot of the ‘sharpness’ out of it, and made it easier to grasp.

We advised on a for both parties satisfactory combination of learning-activities consisting for example ‘coaching’ by a higher placed manager, highlighting in the first place not the situation of the coached but ways in which this coach resolved difficult situations. In this way organizing ‘yellow’-learning, an opportunity to observe and copy the art.

From then on we tried to tickle common accepted views like the one that anyone can learn something in a training-situation, or that learning situations need to be safe. We started to use the learning language theory and the instrument in a more pro-active way. Introducing learning-profiles (a combination of the colours of learning-scan and other instruments on learning) in the general introduction to an MD-programme (with a green and red learning-architecture), did put us for a couple of new questions we did not completely decided on how to react to yet: Three participants of the same group, came out with a same colour-profile as the manager described earlier; a lot of yellow and white, very little blue, and little green and red. All three described the kind of learning in the MD-programme as not being their favourite. One of them however was highly motivated, wanting to see the effect of his interventions on the group-process. One of them wasn’t so eager to participate in the first place, but willing to try. The third one really didn’t want to participate. Talking this over with his manager, was very illuminating in first instance. He

recognized the way of learning of his employee. But in the end the pressure of the implicit rules in the organization seemed strong: it was arrogant not to participate in the program.

What to do? Are there new rules to make? How to use the information of the colours of learning? When should one develop a style of learning? Are their preferred connections between learning goals and colours? For example; are there goals best served with a red-learning approach? Do you need to develop a colour – for instance if your profile shows two percent blue?

With the introduction of the learning language, new questions and new issues arise.

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Appendix A: 10 components and five learning colors

	Yellow	Red	Blue	Green	White
situations in which one learns	In complex situations and under pressure	During inspirational meetings with others	When this is planned, organised and structured	In a conducive learning environment	During inspirational meetings with others
learning with others	In dialogue with others	In dialogue with others	I learn together with others when this is more efficient	Others help me to develop	I regard others as sounding boards for my ideas
dealing with mistakes	Every disadvantage (every mistake) has its advantages	I try to avoid them	I try to avoid them	I learn a great deal from my mistakes	Mistakes keep you on your toes
the role of emotions	Tension, stress	Security, trust	Clarity, certainty	Security, trust	Inspiration, curiosity
from whom do you learn	From experts who are respected in their field	From colleagues and fellow workers	From experts who are respected in their field	I learn something from everyone	From people who can hold my interest and inspire me
what is knowledge	Expertise	Shared insights	Objectivity	Expertise	Something that has personal meaning
acquiring knowledge	By observing others	By talking to others	By taking part in learning activities	By taking part in learning activities	You are learning all the time
guidance	Sponsor (to back you up)	Team coach (to supervise the group processes)	Teacher (to supervise the content)	Supervisor (to supervise the learning process)	Team coach (to supervise the group processes)
where learning takes place	In day-to-day life, in complex situations	In places where people meet	In a formal learning environment	In an environment that offers sufficient opportunity to try things out	In day-to-day life, in complex situations
why learning	To get ahead	To get ahead together with others	To be able to do things better, to gain expertise	Because its inevitable	Because its inevitable