



## Varieties of work related learning

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### ABSTRACT

Based on 30 interviews with and observations of professionals, 5 prototypical metaphors of learning are described and related to existing theories about learning. Two of the metaphors were previously described by Sfard: the acquisition and participation metaphors. As well, three new metaphors were found: the discovery metaphor, the apperception metaphor and the exercising metaphor. In an initial study, a newly devised questionnaire was tested with 713 elementary teachers, 92 principals and 33 support people. The five learning metaphors could be distinguished and proved to be reliable, although improvements were necessary. The correlations between the scales were as expected. Meaningful relations were found with the variables of the educational system, age, experience and educational level. In a second study, a revised questionnaire was tested with 556 professionals from 12 different organisations. The five learning metaphors proved to be more reliable than in the first study. The correlations between the scales were in line with expected patterns of correlations: implicit, explicit and social preferences correlated more with each other than with the other preferences. The expected differences between organisations, professions and groups were apparent and could be interpreted meaningfully. The discussion describes the practical use of the metaphors and suggestions for further research.

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### 1. Introduction

In our work with professionals, we discovered that where there was an explicit need to talk about learning, everyday language is insufficient. For example, in a conversation between a manager and an employee preparing a personal development plan, many communication problems may arise. People use the same words with different meanings and different words for similar meanings. Due to the limited distinctions made between different ways of learning, learning is often confused with training, individual differences in preferences are not taken into account, and possibilities to organize learning in various ways are not even considered. Our search here is for a language of learning: a system of meaningful distinctions in ways to learn, in order to help professionals and their managers to talk about learning. This article describes a system of five metaphors of learning. It first describes an interview/observation study generating the five metaphors.

### 2. A first step: finding the metaphors qualitatively

As a first step, we selected 30 professional colleagues who we expected to have different perceptions of learning. The colleagues were selected on the basis of their view of organisational changes. De Caluwé and Vermaak (1999) defined five

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different, implicit theories of change, attaching five colours to these views. Let us give a short impression. The most well known theory about change is the blueprinting metaphor. The blueprinting idea about organisational and personal change is that organisations or persons change when there are clear goals and results as well as clearly stipulated plans so that everybody really knows where to go to, and how to define and operationalize it. 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, and by influencing people. The red theory of change is that people and organisations change when there is a supporting and rewarding climate. Rewards, atmosphere, getting the best out of people, career planning are aspects of a red theory of change. An organisation will change if it gives attention to people, if the climate is good and employees get something more out of it, for instance more money or more recognition. The white theory focuses on chaos and complexity, on inspiration and flow. Living systems have limited predictability. People and organisations change in dynamic, open situations. This is a bottom-up approach. If you want to change an organisation or a person you have to leave room for people to bring in their own ideas, to give them rights to influence their situation and to develop the ideas from the bottom up. 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 organisations change when a long-term perspective is taken and when there is a focus on learning abilities of people and learning abilities of the organisation.

We interviewed and observed five colleagues per change colour and expected that their change colour would be correlated with their preferred ways of learning. Soon we discovered, however, that change colours and learning preferences were not correlated. Instead, we then proceeded to describe the various ways to learn that we found in the total group. We did this through the use of metaphors of learning. A metaphor is a mental construction that helps us to structure our experience and to develop our imagination and reasoning. This led to the following descriptions of five prototypical learning metaphors.

### *2.1. Apperception metaphor*

The assumption that you can only learn in a peaceful and harmonious atmosphere does not hold true for everyone. Learners who prefer apperception learn well under pressure, saying that 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 they learn by example and good observation. These learners are very interested in tales concerning best practice and what works. It is probably obvious that these learners are not exactly keen on situations involving role-play and exercises; they will soon come to regard these 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.

### *2.2. Participation metaphor*

People who prefer the participation metaphor learn socially. In the past, learning was often regarded as a solitary process. Increasingly, however, the social side of learning is being emphasized: we 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 it is possible to arrive at a joint meaning. People who prefer participation learn by interacting and communicating. Interaction is essential for them. They need the cut and trust of discussion to sharpen and clarify their ideas, being forced to explain their thoughts, which, in turn, encourages feedback in the form of reactions and ideas from others. Learning is easiest for these learners within a group where the members are interested in and trust each other. Support in the form of a team coach, someone who can guide the group process, can be useful, but the division of tasks within the group and rotating chairmanship is a good alternative.

### *2.3. Acquisition metaphor*

Although many trainers and teachers are trying to find ways to bring theory and practice 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 matter. After all, knowledge is objective and it is important to gain knowledge in an unsullied environment. For these learners, mistakes should be avoided: making mistakes is a sign of planning errors, sloppy preparation or inadequate knowledge. These 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 results have been achieved.

### *2.4. Exercising metaphor*

Together with “acquisition”, “exercising” is perhaps the most well known learning preference. Time and time again, exercising seeks to bring learning closer to the workplace, choosing forms such as on-the-job training, work experience and

**Table 1**

The five metaphors characterized in keywords.

Learning by ...	Keywords
Apperception	Role models, best-practice, real-life, pressure, implicit learning, imitation, observation
Participation	Dialogue, with others, collaboration, discourse, trust, enculturation, communities of practice
Acquisition	Objective facts, transmission, knowledge, from experts, theories
Exercising	Safe environment, practising, skills, attitudes, simulations, explicit learning, role playing
Discovery	Meaning, deep understanding, inspiration, self regulation, knowledge creation, productive, designing

role-play. The greatest concern is whether what is learned can be applied in practice. For this reason, wherever possible, training is carried out in realistic situations; situations that reflect everyday practice 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 making mistakes in it. The environment should also be uncluttered enough not to detract learners from their primary goal. Moreover, it must be peaceful enough to allow learners to reflect on what they have learned. In short, learning as exercising requires a peaceful, safe, not too complex, but realistic environment where learners 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 pass on things that will bring learners a step closer to their goal. With these learners, mistakes can also be discussed, because mistakes contain a wealth of information that helps learning.

### 2.5. Discovery metaphor

Learning as “discovery” is based on the premise that life and learning are synonymous. We do not just learn during a course; we are always learning. There is no such thing as “not learning”. Learning means finding our way through and understanding situations. Being conscious of this, teaches us a great deal about daily life and those unexpected events that confront us all. An important prerequisite is a large degree of freedom. Learners who prefer discovery like to go their own way. This does not necessarily have to be the most efficient path, as long as it is the most interesting one. These learners search for inspiration and meaning and find these in their environment, friends and the people around them. Knowledge is what they themselves construct. The discovering learner does not really require their learning process to be supervised, but an inspirational teacher or supervisor will be taken seriously. These learners are often recognized 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 promote alertness. If something takes too much time and effort, it will be necessary to try another tack.

Table 1 characterizes these five metaphors with some keywords.

## 3. Embedding the five metaphors in theories of learning

In this section we aim to embed the five metaphors described above in theories of learning. In her article on two metaphors for learning and the danger of choosing just one, [Sfard \(1998\)](#) describes a first useful 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”. Knowledge of the world is treated as the objective truth that can be transmitted from one person to another ([Bruner, 1996](#)). Theoretically, the acquisition metaphor stems from and resides in the tradition of cognitive psychology, which focused on the storage, organisation and retrieval of information in memory ([Anderson, 2000](#); [Anderson, Reder, & Simon, 1996](#)). In educational psychology, [Ausubel \(1963\)](#) especially worked in the tradition of the acquisition metaphor. Keywords are objective knowledge, structure, and expertise.

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 largely 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.

Paavola, Lipponen, and Hakkarainen (2002) 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, from Engeström (1999), Bereiter (2002) and Nonaka and Takeuchi (1995). These three theories share, so they argue, six common characteristics that are different from the acquisition and the participation metaphor. Firstly, 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. Second, 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. Third, learning is fundamentally social: new ideas grow between individuals and not within individuals. Communities play important roles in knowledge creation. Fourth, individuals however play important roles as instigators of innovation. Analysis of individual tacit knowledge is for instance an important start for innovation. Fifth, tacit knowledge is an essential resource of creative experts, and finally, there is a focus on conceptual and theoretical modeling, using symbols and externalization of tacit knowledge and theory. This theorizing and conceptualizing goes with risk-taking, uncertainty, looking for new and promising ways, and so on. 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. Hager (2004) independently suggested a similar metaphor: the construction metaphor. Because of the different connotations “creation” and “construction” have in practice, we have called this the discovery metaphor instead.

The fourth metaphor appears in the literature of management learning. Meggison (1996) called it “emergent” learning. It is a type of learning that is not planned; moreover, it is not recognized as being learning. It is learning perhaps best described as “on the spur of the moment”, working on a highly complex issue, looking around, searching for what works, analysing and copying it. Van der Sluis (2000) also describes emergent learning as an important way of learning practised by managers. Van den Berg and Poelje (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). All these can be seen as forms of implicit learning (see Bolhuis & Simons, 1999). Theoretically, this way of learning relates mostly to the social learning theory of Bandura (1986) focusing on observation, imitation and modeling as vehicles for learning. We will use the term the apperception metaphor in this context.

Finally, we believe that the fifth metaphor of learning resides more in the learning organisation (Senge, 1990) 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 more quickly than competing organisations. Senge proposed five dimensions that together create the ability to learn as individuals and as an organisation. Central in this approach is that learning gets an explicit focus in the working environment, both individually and collectively. People should reflect on their learning explicitly and organize their learning explicitly for the sake of survival of the organisation. Another theoretical approach that underlies this final metaphor is Erickson’s deliberate practice theory. This theory describes how musicians, athletes and workers practise deliberately on a regular basis in order to reach higher levels of expertise or competence (Ericsson, Krampe, & Tesch-Romer, 1993). The fifth learning metaphor, which we call the exercising metaphor, thus focuses on learning abilities 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. Learning can often be the foreground and working the background. It is explicit learning that is, however, not focusing on knowledge (as the acquisition metaphor), but on skills, attitudes and expertise. For learning one needs guidance by experts and collaboration with others in safe environments.

All in all, we believe that we could place the five metaphors of learning on the job in the literature about learning theories: the acquisition metaphor, the participation metaphor, the discovery metaphor, the apperception metaphor and the exercising metaphor.

## 4. Study 1: metaphors of teachers in primary education and their principles

### 4.1. Introduction

The next step was to devise a questionnaire that measures views of learning in terms of the metaphors. The study aimed to find information about the reliability, validity and face validity of the new instrument as well as to find further suggestions for improvement of the instrument and the theory behind it. The study reported here tries to find answers to the following questions:

- (a) How reliable and distinguishable are the five learning metaphor scales?
- (b) Can we predict patterns of correlations according to theoretical expectations (see below)?
- (c) What relations appear between learning metaphors and personal and contextual variables?

We expected the following correlations to be higher:

- (1) between acquisition and exercising, because they both refer to explicit learning;
- (2) between discovery and apperception, because they both refer to implicit learning from others;
- (3) between participation and exercising, because they both refer to learning from and with others.

## 4.2. Methods

### 4.2.1. Subjects

In total, 923 people from 39 elementary schools and related organisations in Eindhoven who attended a conference in the fall of 2003 participated in the study; 872 questionnaires proved to be usable. There were 92 managers, 715 teachers, 33 support people (counselors, ICT support) and 42 with other functions (parents, researchers, outsiders, etc.). The last group was not analysed here because of its heterogeneity. The ages ranged from 20 to 65 and experience from 0 to 40 years. Forty-eight had a university degree, 746 had a degree in higher professional education, and 64 had middle or lower education as their highest degree.

### 4.2.2. Materials

Based on the prototypical descriptions of the metaphors, a questionnaire was developed in several cycles of test and change. Experts were asked to look at the formulation of the questionnaire. The test had 10 components with four alternatives per question, making a total of 40 questions. In each item, one alternative loaded on two of the metaphors. This was done in order to give room for the overlap between the metaphors and to make the outcomes less predictable. Respondents had to divide seven points over the four alternatives. They could give all seven 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, and so on. The points given to the overlapping alternative counted for both metaphors. The first question was for instance, "in which situations do you learn best?" The four alternatives were: (a) when there are clear goals and structure (acquisition); (b) during inspirational meetings with others (participation and discovery); (c) in complex situations and under pressure (apperception); and (d) in a conducive learning environment (exercising). 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.

### 4.2.3. Procedure

All participants of a particular conference were obliged to fill in an Internet version of the 40-item questionnaire before entering the conference website. It was presented as an aid to find out which sessions were fitting their learning preferences. The results of 51 people were removed from the data set, because there were doubts about the seriousness of their responses.

### 4.2.4. 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 seven 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 zeros stayed zero, because the meaning of this was clear: "I do not recognize or use this item". All highest scores were coded 4, indicating that this was their preference. If there was one more choice made, this became 3. If there were 2 more choices, these became 2. So a pattern like 5-1-1-0 became 4-2-2-0; patterns with 2-2-2-1 became 4-4-4-3; and patterns with 3-3-1-0 became 4-4-3-0. The reliabilities indeed were better, indicating that the division of the seven points had stood in the way (see below). The analyses pertained to one-way ANOVAs and Pearson correlations.

## 4.3. Results

As a first step, we created five scales with acceptable coefficients alpha. For each of the scales we removed one item (the one with the lowest (often negative) item rest correlation). The resulting alphas are apperception: .57, participation: .55, acquisition: .64, exercising: .64, and discovery: .52. Table 2 presents the correlations between the scales. The scales correlated moderately, but all significantly ( $p < .01$ ) with each other, but were distinguishable. The highest correlations between the scales were the ones expected according to our theoretical expectations: acquisition with exercising (.39), apperception with discovery (.53) and participation with exercising (.36). The correlation between acquisition and apperception was unexpectedly high (.45).

Table 3 presents the correlations between the learning scales and age and experience. There were negative correlations between age and experience with apperception and exercising, and positive ones with acquisition. The older and more experienced people were, the more they chose acquisition and the less they chose apperception and exercising.

Next, we looked for differences between the scale scores as depending on the educational level of the respondents (see Table 4). There were significant differences for apperception ( $F = 4.21$ ;  $p = .02$ ) and exercising ( $F = 3.07$ ;  $p < .05$ ). People with a university degree scored higher on apperception than the other two groups. The higher the educational level, the lower were the scores on exercising.

**Table 2**

Means and Standard deviations and correlations for the five scales.

	N	Mean	SD	Ap	P	Ac	E	D
Apperception	872	14.78	6.32	–	.28	.45	.33	.53
Participation	872	23.10	6.09		–	.21	.36	.33
Acquisition	872	19.56	6.92			–	.39	.22
Exercising	872	23.88	5.82				–	.21
Discovery	872	20.73	5.74					–

Note: SD means standard deviation.

**Table 3**

Correlations between the scales and between them and age and experience.

	Age	Exp.	Ap	P	Ac	E	D
Age	–	.81**	–.11**	.03	.09**	–.11**	–.06
Experience		–	–.09*	.04	.10**	–.07*	–.03

\* Significant at the .05 level (2-tailed).

\*\* Significant at the .01 level (2-tailed).

**Table 4**

Differences between educational levels and the learning metaphors (one-way ANOVA).

		N	Mean	SD	F	Sig.
Apperception	University	48	16.63	5.73	4.21	.02
	Higher professional	746	14.83	6.32		
	Middle level	64	13.16	6.36		
Exercising	University	48	22.81	5.80	3.07	.05
	Higher professional	746	23.82	5.86		
	Middle level	64	25.41	5.04		

Note: SD means standard deviation.

Table 5 presents the results of comparisons between functions in the educational organisations (principals, teachers and support people). There were significant differences for exercising ( $F = 5.03$ ;  $p = .007$ ) and discovery ( $F = 3.51$ ;  $p = .03$ ). Principals scored higher on discovery and lower on exercising than the other two groups.

Finally, we looked at the average scores on the five scales for the total sample (see Table 2). In this work environment in and around elementary schools, there was a dominance of the participation (dialogue and collaboration) and the exercising (practising and explicit learning) metaphors, whereas the scores on the apperception scale (learning from role models and under pressure) were rather low.

## 5. Study 2: the improved instrument

### 5.1. Introduction

The results of the first study were promising, but there were also many improvements and changes needed. The scoring system needed to be changed, the dependency between items needed to be removed, and for many formulations we found better alternatives. Based on the first study, the theory was adjusted and a new 60 (instead of 40) item improved instrument was devised. Table 6 presents the 15 dimensions and the alternatives per metaphor that were constructed on the basis of the previous study.

**Table 5**

Significant differences between functions on the scales (one-way ANOVA).

		N	Mean	SD	F	Sig.
Exercising	Management	92	22.13	6.11	5.03	.007
	Teachers	715	24.15	5.78		
	Support	33	23.36	6.31		
Discovery	Management	92	22.15	5.34	3.51	.03
	Teachers	715	20.49	5.81		
	Support	33	20.21	5.45		

Note: SD means standard deviation.

**Table 6**  
The complete system of 15 dimensions and five metaphors.

	Apperception	Participation	Acquisition	Exercising	Discovery
Which circumstances are helpful?	In complex issues in which to come up with a solution in no time	During inspirational meetings with others	When there are many knowledge sources available	When there is space and time to practice	During work, running into new and interesting issues
Collaboration with others	I regard others as sounding boards for my ideas	In dialogue with others I solve problems easier	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	I do not learn a lot from my mistakes	I try to avoid them by thorough preparation	I try to avoid them by thorough preparation	I learn a great deal from my mistakes	Mistakes keep you on your toes
Which emotions are helpful for development?	Tension, stress	Security, trust	Clarity, certainty	Security, trust	Inspiration, curiosity
Who makes you think?	Critical friends from outside	Colleagues and other professionals	Experts	Colleagues and other professionals	Can be everyone
Which knowledge is important?	Expertise	Shared insights	Proven knowledge	What gives me footing	Shared insights
How do you acquire knowledge	By looking at what works	By talking to others	By taking part in learning activities	By taking part in learning activities	By everything I do
The ideal guide has?	Practical experience	Skill in steering group processes	Specialised knowledge	Pedagogical skills	Sagacity
What is annoying?	Long windedness	People who withdraw themselves from a team	Lack of knowledge, ignorance	Having to act without proficiency	Lack of space for your own influence
Preferences in training situations?	Company visits	Intervision	Lectures	Workshops	Learning within a practical assignment
Who determines your development?	Contributions to organisational development	My team	Contributions to organisational development	A coach or mentor	What I encounter in my work
Organising learning at work?	There are enough occasions in my daily work	Searching for discussions with others	Reading a good book	Deliberate practice of new behaviour	There are enough occasions in my daily work
Main trap?	Being bored too soon	Failing to take time to think	Looking for the truth too long	Keeping on reflecting	Finding too many things interesting
Reactions to unknown situations?	Asking others' advises	Asking others' advises	Trying to know as much as possible about it	Finding a way to exercise	Jumping in
What makes you think?	Successful solutions	Differences in points of view	The knowledge needed	My own actions	My own actions

The research questions for the second study were the same as those in the first study (see above).

## 5.2. Methods

### 5.2.1. Subjects

In total, a group of 556 people out of 46 different organisations (ministries, cities, consultancy bureaus, training bureaus, police, higher education, insurance companies, and banks) participated in this study. Their professions differed from manager to HRM staff-member, from consultant to trainer. In total, informants from 12 different professions participated in this study.

### 5.2.2. Materials

A new questionnaire was developed in several cycles of test and change. The test had 60 items divided over 15 questions/components with four or five alternatives per question (see above). In 10 of the questions one alternative loaded on two of the metaphors. This was done in order to give room for the overlap between the metaphors as described. Respondents had to answer on a 5-point scale, ranging from not applicable to fully applicable. The middle point of the scale (3) is “average”. The points given to the overlapping alternative counted for both metaphors. An example of a set of items with five alternatives is:

What should an ideal guide have?

Pedagogical skills	1,2,3,4,5	(exercising)
Skills in directing group processes	1,2,3,4,5	(participation)
Practical experience	1,2,3,4,5	(apperception)
Sagacity	1,2,3,4,5	(discovery)
Domain knowledge	1,2,3,4,5	(acquisition)

An example of a set of items with four alternatives is:

Which emotions are helpful for development?

Tension, stress	1,2,3,4,5	(apperception)
Security, trust	1,2,3,4,5	(exercising, participation)
Clarity, certainty	1,2,3,4,5	(acquisition)
Inspiration, curiosity	1,2,3,4,5	(discovery)

### 5.2.3. Data analysis

The learning metaphor scales were analysed with the SPSS program reliability. We checked whether the alphas for the scales were high enough. We considered .60 to be the minimum value to be needed, because the instrument has no selection purpose but aims to raise awareness. We also checked the item-scale correlations (should not be negative and preferably around .20), the mean item scores (not too high or low) and the standard deviations (not too low). Furthermore, we calculated correlation coefficients. We (again) expected the following correlations to be higher than the others: between acquisition and exercising because they both refer to explicit learning; between discovery and apperception because they both refer to implicit learning from others; and between participation and exercising because they both refer to learning from and with others.

### 5.2.4. Procedure

The data were collected in consulting-settings, as part of an individual learning trajectory, the start-up of a management development system, or an organisation-development trajectory.

## 5.3. Results

The five learning metaphor scales proved to be reliable. The alpha-coefficients were apperception (after removing one item per scale): .57, participation: .68, acquisition: .72, exercising: .67, and discovery: .64. With one exception

**Table 7**

Coefficient alphas, means, standard deviations and correlations for the total sample.

	N	Mean	SD	Ap	P	Ac	E	D
Apperception	556	47.48	5.2	–	.30	.24	.12	.47
Participation	556	48.15	5.3		–	.25	.45	.34
Acquisition	556	41.83	6.4			–	.51	.10
Exercising	556	40.45	5.9				–	.06
Discovery	556	50.01	5.2					–

Note: SD means standard deviation.

**Table 8**  
Significant differences between men and women.

	Men	Women	<i>t</i>	Sig.
<i>N</i>	293	178		
Exercising	50.6 (5.6)	52.5 (4.9)	3.0	.03
Participation	43.9 (6.0)	45.1 (6.0)	3.7	.00

(apperception) the reliabilities of the scales were higher than in the previous study and above the .60 criterion. Table 7 presents the scale averages, standard deviations and correlations for the total group. The theoretical range of scores per metaphor was 0–75. Discovery and participation received the highest scores.

Except for the relation between discovery and exercising, all correlations were significant statistically. The highest correlations were the ones expected: between acquisition and exercising (.51; explicit learning); apperception and discovery (.47; implicit learning from others); and between participation and exercising (.45; learning socially).

There were significant correlations between years of experience and the discovery scale ( $r = -.13$ ;  $p < .05$ ). The older people were, the lower they scored on the discovery scale. One metaphor correlated with educational level: participation ( $r = .14$ ;  $p < .05$ ). The higher the educational level, the higher the participation scores. There were significant differences between men and women in the participation and exercising scores ( $t$ -values of 3.7 and 3.0 respectively) (see Table 8).

There were also differences between preferences of different positions/functions in the organisations. Managers scored significantly lower on exercising than professionals and workers ( $F = 6.89$ ;  $p < .01$ ). Management consultants scored significantly higher on participation than Human Resource Development (HRD) professionals ( $F = 2.73$ ;  $p < .05$ ). Finally, the categories of organisations differed significantly on two out of the five metaphors (exercising and apperception) ( $F$ 's of 3.17 and 3.89 respectively).

## 6. Discussion

The results of the second study showed better reliabilities of the five scales than did the first study. Except for the scale of apperceptions, the alpha values were acceptable. The correlations between the scales were according to the expected pattern in both studies. Explicit learning scales correlated with each other and the same held for the implicit learning and social learning scales. There were correlations with personal (position in the organisation, educational level) and contextual (type of organisation) variables. There were some correlations with age and experience.

The dominant metaphors in the group of managers and consultants were participation and discovery. This contrasts with the dominant metaphors of teachers and educational managers in our first study who preferred exercising and participation. The expected preference of managers for the apperception metaphor did not appear. That women prefer the participation metaphor more than men is consistent with other research where women generally prefer social situations more than men.

In all, the learning metaphors can be measured in a reliable way, although there is still room for improvement. In particular, the alpha for the apperception scale is too low, but also some other items can be improved. From the item analyses as well as the feedback from respondents we derived several textual changes, and these have been made in the third version. The patterns of correlations and the relations with personal and contextual variables strengthen our idea that the instrument is valuable. This also shows up in the many positive reactions we received from subjects. Almost all those who answered the questionnaire reported that they recognized the pattern of preferences that appeared and that it enlightened discussions with colleagues. Groups tended also to recognize existing debates about learning between peers and known individual differences. Thinking in terms of overlap and tensions between highest and lowest scores proved to be very especially helpful. Thus there is also some face validity and functional validity.

In practice, using the metaphors of learning can be an effective aid in talking about learning, from our experience. As well as gathering data to investigate our ideas, we also experimented with applications in practice. We 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 (face validity). For example, we found high scores on acquisition for people with a need for knowledge, and people who made an issue out of the safety in the group scored high on exercising, while participants with a high score on apperception on the contrary wanted the feedback to be sharper and the atmosphere less "nice". The apperception learners wanted more experienced colleges to come in and talk about their best practices, while the exercising learners did not want to listen, but wanted to try out things themselves.

The first time we used this instrument in a less descriptive and more active way was in response to a request of HRD-professionals of a large international organisation. They were wondering how to respond to a manager who did not feel like participating in an organisation wide manager development (MD) program. This non-participation was a big issue: The manager was criticized for not "wanting to learn". "How can he tell us that he can not learn anything in this management development program?" The learning metaphors questionnaire was one of the instruments we used to pinpoint the preferred way of learning of this manager. A high score on discovery and apperception and a low score on participation and exercising explained his attitude. For him, an MD-program was not the real-thing. Whatever would be learned, in real life things would be different and the lessons learned would not be applicable. Putting his reflections in perspective to the other metaphors took a lot of the "sharpness" out of it, and made it easier to understand. We advised on a satisfactory combination

**Table 9**

Overlap and differences of learning metaphors.

Difference	Learning metaphors	Overlap
Observing versus participating	Apperception–participation	The need for others
Experience versus expertise	Apperception–acquisition	Focus on goals, results
Tension versus safety	Apperception–exercising	Respecting experience
What works versus what is new	Apperception–discovery	Learning in the real world
Process versus content	Participation–acquisition	Avoiding mistakes
Collective learning versus learning with others	Participation–exercising	Safety and trust
Collective meaning versus personal meaning	Participation–discovery	Meaning construction
Knowledge versus experience	Acquisition–exercising	Explicit focus on learning
Objectivity versus subjectivity of knowledge	Acquisition–discovery	Focus on content
Guided versus self-directed	Exercising–discovery	Focus on personal growth

for both parties of learning activities consisting for example of 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. Commonly accepted views such as the one that anyone can learn something in a training situation, or that learning situations need to be safe, can be hindering in organizing learning. We make explicit these mental models in our own work and in the conversations with clients. We make them explicit and try to reframe them.

An especially appealing application of the instrument is to look at patterns of preferences. Most people have high scores on two of the metaphors and a low score on one or two. We use the overlap between the two highest scores to find an underlying theme or topic. Exercising and participation, for instance, overlap in a need to work with others, and apperception and acquisition and discovery overlap in a focus on content. Moreover, we also look at the greatest contrast: which is the underlying contrast that shows up in the difference between the highest and the lowest score. Apperception and exercising, for instance, differ the most on the preference for learning under pressure and learning in a safe environment. Table 9 presents the overlap and contrasts as we used them.

In one session, we organized five ways of learning photography: a lecture about laws of lenses, a debate about the drawbacks of digital photography (ethical issues of manipulation), a guided exercise in making high contrast photos, a session around an experienced photographer with his portfolio of his photos, and a room where people could make their own photos with digital cameras independently. There were two interesting observations: Firstly, when people were in a session that matched their preference everything went smoothly, but in mismatched situations there were all kinds of dissatisfactions and frustrations leading to discussions about processes and relevance (why should I listen to this; what can I do with these cameras). Secondly, some people, especially younger ones, seemed not to know their preferences very well: they discovered in practice what their real preferences were.

The metaphors can, in our experience, be used in the following ways:

- (a) To give people more insight in their learning and make them aware of their own learning preferences;
- (b) As a language that people use in communicating about learning, and choices in how to reach developmental goals, with their managers and peers;
- (c) As a way to characterize learning cultures of a team, department or organisation. We experimented with the calculation of group scores on the metaphors. Differences between groups as well as discrepancies between individuals and their teams proved to clear up existing miscommunications;
- (d) As an aid to make decisions about learning trajectories (see above);
- (e) As an aid in redesigning working places for better learning.

However, there are, of course, also concerns. One concern relates to the social desirability of the questionnaire. Some people may answer what they think to be good and acceptable in the culture instead of what is applicable to them. Furthermore, some people may not know well enough how they prefer to learn. Did they think about it enough to be able to answer the questions? Some people need perhaps more reflection “in and on action” before they are able to estimate their preference. And thirdly there is the question of specificity: how general are learning preferences? Are they not related to specific contexts and learning outcomes? Further research into these issues and concerns is needed.

The introduction of the learning metaphors raises new questions, for instance:

- How should the information of the metaphors of learning be used? (match/mismatch)
- When should the further development of learning style be enacted? (match with organisation?)
- Is the preferred way of learning always the best way for the person and for the organisation?
- Is there a “minimum” you need of every metaphor? Is a balanced pattern better than an unbalanced pattern?
- What about people who score low on all scales?
- Can we measure disaffection for certain learning metaphors?
- Are there preferred connections between learning goals and metaphors? For example; are there goals best served with a participation learning approach?

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