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Conceptualizing On-the-Job Learning Styles

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The broad aims of this study are to gain insight into employees' on-the-job learning activities to help them improve their on-the-job learning. The authors define on-the-job learning styles and operationalize the concept to include both mental and overt learning styles and both interpersonal and intrapersonal learning styles. Organizations and employees can benefit from an awareness of employees' on-the-job learning styles, by developing an adaptive flexibility in the use of on-the-job learning strategies.

Keywords: *on-the-job learning; learning behavior; learning style; on-the-job learning style; on-the-job learning strategy; on-the-job learning situation; awareness; adaptive flexibility*

The broad aims of this study are to gain insight into employees' on-the-job learning activities, which can be used to help them improve their on-the-job learning. Due to the increasing rate of change in the world of work, life-long learning is high on the political agenda in many countries. Policies are mostly directed at education and formal training (Skule, 2004). However, these are not always available to everyone, and in many situations they have several disadvantages: It does not have an effect unless it is well-timed; it often seems difficult to transfer what has been learned to the daily work situation; and it is expensive (van Woerkom, 2003). Furthermore, beside continuously learning new competencies, employees should also learn how to learn efficiently, to adjust to new situations (e.g., Chalofsky, 1996; Onstenk, 1997a; Poell, Chivers, van der Krogt, & Wildemeersch, 2000). It is doubtful whether formal training or education can have such an effect on employee learning skills (Baldwin & Ford, 1988).

Therefore, in the field of human resource development, a shift is currently taking place from a training orientation to a learning orientation, with growing attention for on-the-job learning (Poell, van Dam, & van den Berg,

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2004). On-the-job learning refers to “implicit or explicit mental and/or overt activities and processes, embedded in working and work-related performance, leading to relatively permanent changes in knowledge, attitudes or skills” (Berings & Doornbos, 2003, p. 48). It does not refer to on-the-job training or professional education. So far, there is a paucity of studies of on-the-job-learning. How do people actually learn on the job? And how can on-the-job learning be stimulated? Few studies have been conducted on similarities in learning processes between learners and even less studies have focused on individual differences in on-the-job learning (Poell, van Dam et al., 2004). In the literature on educational psychology, however, individual differences in learning processes are often studied, namely in research on learning styles. Research in this area, however, hardly focuses on on-the-job learning.

In this article, we conceptualize learning styles in on-the-job settings. We investigate the applicability of learning styles in on-the-job learning situations and to what extent the original concept should be transformed to be applicable in this situation. To gain more insight into these issues, we have formulated the following research question: How can learning styles be conceptualized in on-the-job learning situations? This main research question can be divided into four sub-questions:

1. How are learning styles defined and categorized, in general?
2. How does learning in on-the-job settings differ from learning in educational settings?
3. To what extent should the definition and categorization of learning styles be adapted to be feasible to on-the-job learning situations?
4. How can organizations and employees benefit from knowledge of employees' on-the-job learning styles?

We start our exploration of the conceptualization of learning styles in on-the-job settings with an examination of the many terms that are used in style research to cover concepts that are closely related to the concept of learning styles. Then, we explain the definition of learning styles, in general, and in on-the-job learning situations, in particular. Next, we propose a categorization of on-the-job learning styles, and finally, we discuss how this knowledge can be implemented to improve on-the-job learning, by making people aware of their on-the-job learning styles and by promoting adaptive flexibility.

Style Research

Many terms in style research that could be applied in (on-the-job) learning situations cover topics closely related to learning styles: personality types, cognitive styles, thinking styles, and decision-making styles. Below, we will explain our preference for the term *learning styles* by describing the

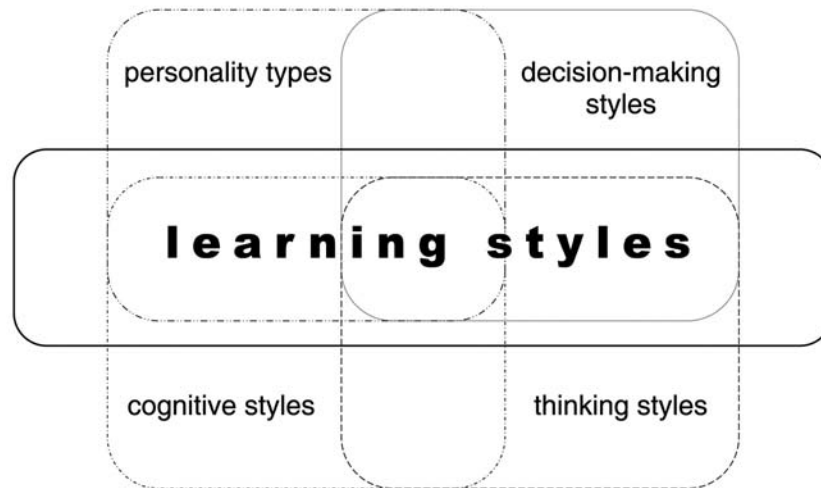


FIGURE 1: Learning Styles in Relation to Other Style Types

meanings of the different terms related to this concept. Personality types are sets of orientations and attitudes that describe basic individual preferences accompanying a person's interaction with the environment (Jung, 1923). They are used to describe deep-seated individual differences exercising a wide but somewhat loose control over the domains of cognitive function, interest, values, and personality development (Ross, 1962). Cognitive styles represent individual differences in how a person perceives, thinks, solves problems, and learns (Witkin, Moore, Goodenough, & Cox, 1977). They are characteristic self-consistencies in information processing that develop in congenial ways around underlying personality trends (Messick, 1984). Thinking styles refer to the ways in which people choose to use or exploit their intelligence and their knowledge. A thinking style is a preferred way of thinking (Sternberg, 1994). A decision-making style is an individual's characteristic mode of perceiving and responding to decision-making tasks (Harren, 1979). The term *learning styles* is commonly used for all these topics; it is a notion that contains the former concepts, concentrating on the learning aspects of the style distinctions (as indicated in Figure 1). However, it is used for other concepts as well, such as environmental preferences and learning orientations.

Learning styles, cognitive styles, thinking styles, decision-making styles, and personality types are closely related. In the literature, the terms are often used as synonyms (Sadler-Smith, 2001a). Disparate measures are used to assess ostensibly the same styles. On other occasions, highly similar

instruments serve to measure purportedly distinct styles (Messick, 1984). Especially the terms *cognitive style* and *learning style* are often used for the same concept (Cassidy, 2004). The distinction is that cognitive styles are more related to theoretical or academic research, whereas learning styles are more related to practical applications (Riding & Cheema, 1991; Swanson, 1995). Cognitive styles are usually described in bipolar dimensions, such as Allinson and Hayes's (1996) intuition-analysis and Cohen's (1967) splitters-lumpers distinction, whereas learning styles are mostly described in combinations of dimensions, which are not mutually exclusive (Riding & Cheema, 1991). In one sense, the term *learning style* can be regarded as a broader term that includes the construct of cognitive style and other dimensions of learning. In another sense, the term *learning style* can be regarded as a narrower term that concentrates on the domain of learning only, whereas the term *cognitive style* is used also when there is no learning involved. For example, Ramírez and Castaneda's (1974) learning style dimensions of field dependency and field independency relate to Witkin's (1962) cognitive styles using the same label and to the cognitive wholist-analytic style dimension (Riding, 1991). Ramírez and Castaneda broaden both Witkin's and Riding's perspectives by combining the two and by including the way in which people approach their environment in addition to their perceptions. They narrow down Witkin's and Riding's perspectives, however, by applying them to the learning environment only.

In workplace learning contexts, the distinction between different style types is even more complicated than in educational contexts. Whereas in educational contexts, learning is usually the main activity that learners perform, in workplace learning contexts, people are working, thinking, making decisions, innovating, and learning at the same time. In this study, therefore, we consistently use the term *learning style*, as we are interested in comprehensive on-the-job learning processes.

In the literature, the various learning style models and definitions have different origins. Some models and definitions are based on learning preferences, some on learning conceptions, learning motivations, learning orientations, or learning behavior. For both theoretical and practical reasons, we opt for a behavior model and definition. The original meaning of the word *style* is "a manner of executing a task or performing an action" or "a mode of deportment or behaviour" (Murray, Bradley, Craigie, & Onions, 1970, p. 1207) and thus refers to overt or mental behavior. Furthermore, the aim of this study is to gain more insight into on-the-job learning processes. Learning processes refer to a succession of actions, and thus, behavior. Finally, we expect that insight into learning *behavior* will offer most opportunities for the improvement of on-the-job learning, because behavior can actively be directed by the learners themselves.

Definition of Learning Styles

Studies on learning styles are part of a complex research field. As indicated above, in this research field many terms are used to cover closely related topics, addressing an enormous number of theories, models, and instruments. Many definitions are used. In this article, we define on-the-job learning styles as follows: An on-the-job learning style is the tendency to use a particular combination of implicit and explicit learning activities that a person can, and likes to, perform. The person adapts the combination of learning activities to each situation differently. This particular combination is called the actualized learning strategy. This definition was constructed in three steps, which we will explain below: First, the choice of an organismic interaction model for describing the distinction between learning strategy and learning style is elaborated. Second, the underpinning mechanism of learning styles is illuminated on a more detailed level. Finally, after the explanation of our general definition of learning styles, in the next section, we make a shift to the on-the-job learning situation for a definition and further conceptualization of on-the-job learning styles.

Learning styles should, in our view, be represented in an interaction model, as learning is a social process that is influenced by both individual characteristics and the psychological meaning of the learning situation (cf. Kwakman, 1999; Wierstra, 2000; Wierstra & Beerends, 1996). More specifically, we believe that learning styles should be represented in an organismic interaction model, in which the cause and effect or situation and organism stand in a relationship of reciprocal action, in which each member affects and changes the other (Kwakman, 1999; Overton & Reese, 1973). Pervin (1968) calls this *transaction*, because there is continuous mutual influence between the different individual and situational factors.

Therefore, applying the model to learning, the perceived situation can be defined as the “perceived learning situation.” The individual factors can be defined as “learning style,” following, for example, Wierstra’s (2000) definition of learning style, “The habitual tendency at a particular moment of time, in a particular learning situation, to manifest a particular learning strategy” (p. 158, translated), and Keefe’s (1979) definition of learning style, “characteristic cognitive, affective, and psychological behaviours that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” (p. 4). People with different learning styles use different learning strategies (Busato, 1998). Thus, in the model “behavior,” the configuration of actual activities can be further specified as the actualized learning strategy.

As Figure 2 illustrates, learning strategies are the result of the interaction between personal factors like learning styles, which are responsible for the relative stability, and situational factors, which are responsible for the variability in the use of learning strategies (van der Sluis & Poell, 2002;

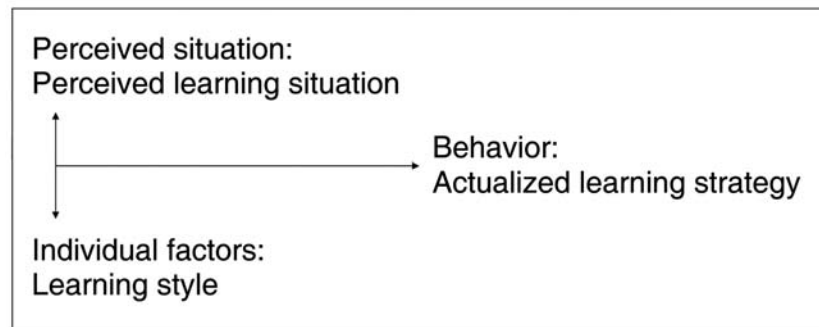


FIGURE 2: Organismic Interaction Model of Learning Behaviour

Vermunt, 1992; Wierstra & Beerends, 1996). People use the same strategy in most, but not all, of their learning situations (Kolb, 1983).

This explanation of the difference between learning styles and learning strategies can offer clarification in the ongoing “state-or-trait” debate in the learning style literature. Some authors regard learning styles as stable over time (a trait), whereas other authors regard them as changing with each learning situation (a state; Cassidy, 2004; Coffield, Mosely, Hall, & Ecclestone, 2004; Loo, 1997). Applying the organismic interaction model, learning strategies can be regarded as a state, changing with each learning situation, and learning styles can be regarded as relatively stable personality characteristics or traits. Because the perceived learning situation and learning style influence each other, they are changeable over a longer period (cf. Hayes & Allinson, 1997; Kolb, 1984a; Loo, 1997; Schmeck, Geisler-Brenstein, & Cercy, 1991; Vermunt, 1992; Witkin, Goodenough, & Karp, 1967). The degree of changeability is dependent on the person’s flexibility (Cashdan & Lee, 1977).

Thus, by distinguishing learning styles and learning strategies in our definition, we made clear that a learning style is the disposition with which a learner enters every learning situation. A learning style is consistent over time and contexts; it is a habitual tendency at a particular moment to learn in a particular way in a particular learning situation. People actualize different learning strategies in different situations (Wierstra & Beerends, 1996). In the next paragraph, we explicate the underpinning mechanism of learning styles.

According to Sternberg and Grigorenko (1997), a style is a bridge between people’s cognitive factors and their personality factors. Simons (1997, 1999) describes learning style as the nature and combination of learning strategies that a person is inclined toward and also able to employ. It is a combination of learning strategies that a person (in his or her own view) can and likes to perform. In other words, learning style is a tendency

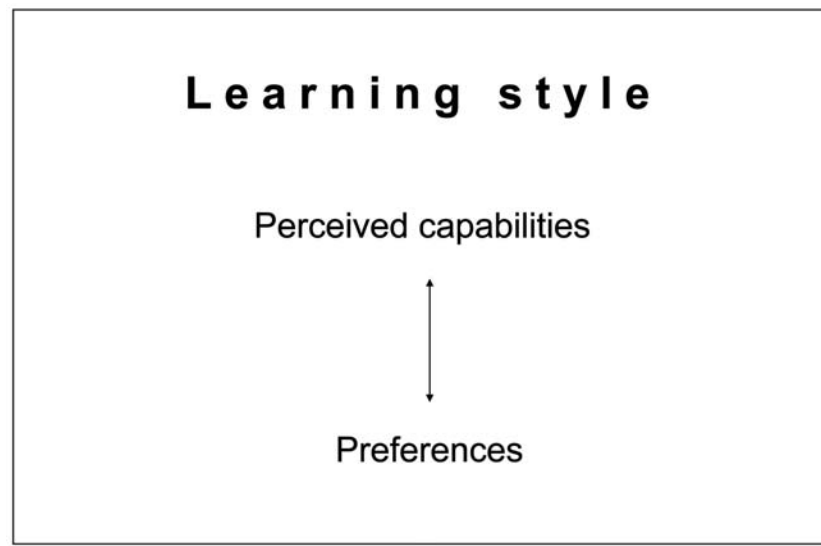


FIGURE 3: Underpinning Mechanism of Learning Styles

to learn in a particular way stemming from a mixture of preferences and perceived capabilities, which should be clear in our definition. As shown in Figure 3, these two factors interact (Bolhuis & Simons, 1999).

We can conclude on the following definition of learning style: A learning style is the tendency to use a particular combination of learning activities that a person can, and likes to, perform. The person adapts the combination of learning activities to each situation differently. This particular combination is called the actualized learning strategy.

Definition of Learning Styles in On-the-Job Situations

To use the concept of learning styles in on-the-job learning situations, the same definition could be used. However, because there are many differences between learning processes in educational contexts—what most literature on learning styles is primarily about—and on-the-job learning contexts, a few supplements are needed. These differences in learning processes are described below, resulting in a definition of on-the-job learning styles.

First, on-the-job learners have more opportunities to choose their own learning activities. In educational settings, these are mostly chosen by the teacher. Second, in educational settings, learning is mainly an individualistic activity, whereas in on-the-job learning situations, learning is often a collaborative or collegial activity (Beckett & Hager, 2002). For employees,

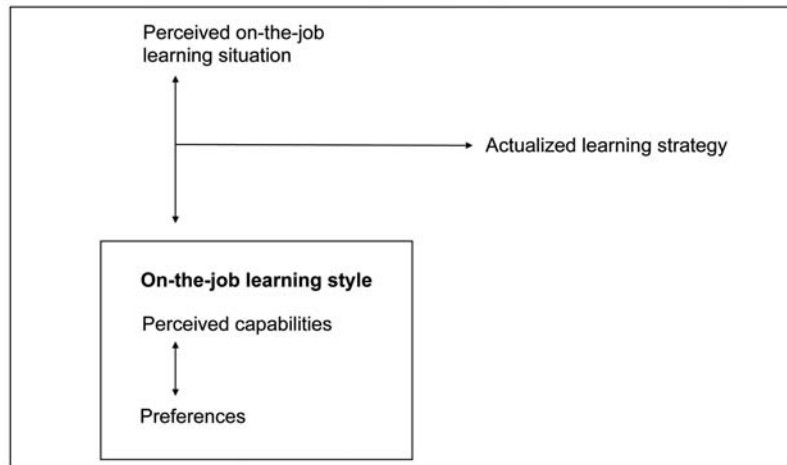


FIGURE 4: Expanded Organismic Interaction Model of On-the-Job Learning Behaviour

interaction with others is the main source of learning (Doornbos, Bolhuis, & Simons, 2004; Eraut, Alderton, Cole, & Senker, 1998; Gear, McIntosh, & Squires, 1994). Finally, in educational settings, most learning is an explicit process, whereas in on-the-job settings, many implicit learning processes take place (cf. Berings & Doornbos, 2003; Bolhuis & Simons, 1999; Eraut, 2000). Berry and Dienes (1993) and Reber (1993), who are often cited in this context, describe the difference between explicit and implicit learning based on intentionality and awareness of the learning outcomes. Implicit learning is unintentional and the resulting knowledge is difficult to express. Explicit learning is typically hypothesis-driven and fully conscious. Eraut (2000) places these concepts on a continuum from implicit learning to deliberate learning, with reactive learning in the middle. The latter is explicit but takes place almost spontaneously in response to recent, current, or imminent situations.

In conclusion, there are three aspects of on-the-job learning processes that need particular attention in the conceptualization of on-the-job learning styles. The fact that learners can choose their own learning activities and that learning is often a collegial or collaborative activity deserves special attention in the operationalization of different aspects of on-the-job learning styles. The fact that on-the-job learning not only concerns explicit learning but also, and perhaps even more, implicit learning needs to be addressed in the definition. Adding to this fact, an on-the-job learning style can be defined as the tendency to use a particular combination of implicit and explicit learning activities that a person can, and likes to, perform on the job. The person adapts the combination of learning activities to each situation

differently. This particular combination is called the actualized learning strategy. This definition is illustrated in Figure 4.

The Perceived On-the-Job Learning Situation

Although many authors claim that the on-the-job learning situation is an important determinant of the actualized learning strategy (e.g., Kolb, 1984a), few attempts have been made in learning style research to investigate the significant factors of the on-the-job learning situation (Wierstra, 2000). Nevertheless, several situational factors concerning workplace learning are elucidated in the literature on workplace learning. It should be noted that research on the effects of different learning situations are still scarce and have ambivalent results (Poell, van Dam, et al., 2004). Furthermore, it should be kept in mind that although all factors of the on-the-job learning situation are discussed in a more or less objective sense in the literature, interactionism suggests that people's learning strategies are influenced by their perception of the learning situation rather than by the objective learning situation (cf. Boekaerts, 1996; Entwistle, 1991; Meyer & Parsons, 1989; Pervin, 1968; Ramsden, 1988; Wierstra, 2000). All factors of the on-the-job learning situation discussed should, therefore, be regarded as they are perceived by the learning employee. This means that the extent to which the learning situation determines the learner's learning strategy is dependent on how the learner perceives that the learning situation models, provokes, regulates, enables, and supports possible learning strategies (Wierstra, 2000). The actualized on-the-job learning strategy is determined by the employees' on-the-job learning style and the perceived on-the-job learning situation.

We distinguish five different categories of factors of the on-the-job learning situation: (a) the task and job content, (b) the information environment, (c) the social work environment, (d) the learning climate, and (e) coincidental factors. The first three categories are derived from Onstenk's (1997b) study on learning opportunities. The task and job content are the breadth and variety of tasks, the degree of innovation, and the amount of problem-solving required. This category also includes the amount of task feedback (Goodman, 1998; Skule, 2004), the amount of challenge (McCauley, Ruderman, Ohlott, & Morrow, 1994), and the degree of control and autonomy of the employee in tasks, methods, procedures, and results (cf. Karasek & Theorell, 1990). Differences in the degree of autonomy will provoke different ways of learning (Ellström, 2001). van der Sluis and Poell (2002) also mention the level of responsibility and transitions in job content, status, or location. The information environment is made up of the physical characteristics of the working environment, including the presence of manuals, job aids, and so forth. Also, opportunities for extensive profes-

sional contacts, such as professional networks and conferences, could be added to this category (Skule, 2004). Finally, the social work environment is made up of daily communication and cooperation with, guidance from, and organized meetings with supervisors and colleagues (Poell, 1998), including external feedback (Goodman, 1998; Kluger & De Nisi, 1996).

Using van der Krogt's (1998) learning network theory, we added a fourth category of factors of the on-the-job learning situation: the learning climate. Poell and van Moorsel (1998) define the learning climate as follows: "The temporary manifestation of the dominant norms, insights and rules regarding learning of a group, department or organization in shared practices in the field of learning which implicitly influences the learning activities employees undertake" (p. 35). According to Baars-van Moorsel (2003), the learning climate involves learning objectives, the learning content, didactics, composition (content structure), and organization (who has the responsibility for providing learning opportunities?). We add the rewarding of professional skills to this category (Skule, 2004). From the perspective of workplace learning, we also consider more informal aspects of the learning climate to be important, such as feedback culture (Argyris & Schön, 1996) and error management (van Dyck, 2000).

The on-the-job learning situation categories described above are considered as relatively stable characteristics of the on-the-job learning situation. However, working, and therefore on-the-job learning, is also determined by coincidental aspects, such as the temperature and the noise outside (Meijman & Mulder, 1998). These coincidental aspects are the fifth category of the on-the-job learning situation.

A Categorization of On-the-Job Learning Style Dimensions

Above, we proposed a definition of on-the-job learning styles and described the components of the on-the-job learning behavior model. In the next section, we will describe which aspects of learning styles should be distinguished in on-the-job learning situations, by reviewing existing categorizations and introducing an alternative categorization of aspects of on-the-job learning styles. Although many articles about on-the-job learning refer to learning styles, few attempts have been made to define the (combinations of) aspects that are well suited to on-the-job learning situations. Mostly, aspects that were distinguished in educational settings originally are simply transferred to workplace settings (Berings & Poell, 2002). Although some of the learning styles distinguished can also be found in work contexts, the same person may have different styles in learning and work contexts.

In the literature, numerous aspects of learning styles are described and many overviews are presented (Cassidy, 2004; Coffield et al., 2004; Rayner

& Riding, 1997; Riding & Cheema, 1991; Sadler-Smith, 1997). Many of these aspects can be regarded as relevant in a comprehensive definition of learning styles. Four categorizations of learning styles aspects that have been proposed in the literature and are often cited are presented here: the different schools that Grigorenko and Sternberg (1995) distinguish, a further breakdown by Rayner and Riding (1997), Curry's (1983) onion metaphor, and Grasha's (1983) categorization. We examine the usefulness of these categorizations, in view of our definition of on-the-job learning styles, to provide a basis for deriving opportunities to improve employees' on-the-job learning processes by awareness of their learning style. None of these four categorizations was fully satisfactory. We therefore suggest an alternative categorization that meets our definition and is suited to on-the-job learning contexts. This alternative categorization can be used in further research to differentiate between most relevant aspects of on-the-job learning styles.

Grigorenko and Sternberg's Categorization

Most authors on styles refer to the different schools that Grigorenko and Sternberg (1995) distinguish. They divided style research into three broad categories:

1. the cognition-centered approach, which is based on differences in cognitive processes and perception;
2. the personality-centered approach, which involves trait type measures; and
3. the activity-centered approach or learning-centered approach, which defines learning and instruction styles.

This distinction has many similarities with the different style types mentioned above. The first two approaches do not necessarily concern learning. The latter and most complex approach, the activity-centered approach, represents learning styles. Rayner and Riding's (1997) subcategories and Curry's (1983) onion metaphor offer more insight into this approach.

Rayner and Riding's Framework and Curry's Onion Metaphor

Rayner and Riding divide the activity-centered approach in Grigorenko and Sternberg's framework into three subcategories:

- a. cognitive-based models of learning styles;
- b. process-based models of learning styles; and
- c. preference-based models of learning styles.

Rayner and Riding (1997) provide many examples of these styles but do not present a description of the categories. We therefore refer to Curry (1983),

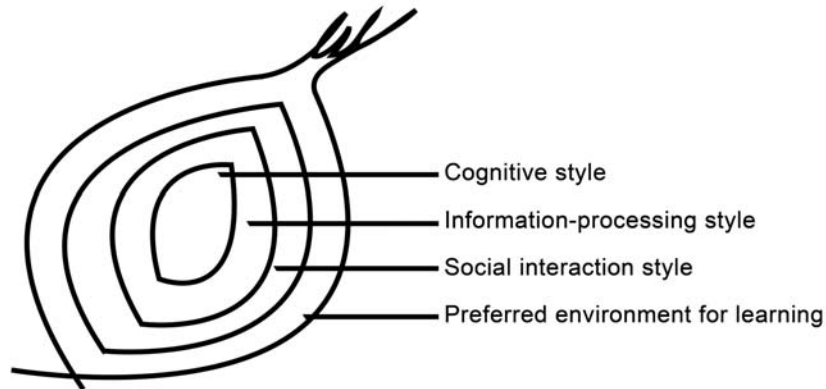


FIGURE 5: The Four Layers of the Onion of Learning Styles

whose onion metaphor provides insight into Rayner and Riding's division. The layers of the onion are analogous to the different degrees of stability in a person's learning style. At the core of the onion is the cognitive style, which includes the approaches to acquiring and integrating information. This layer is the most stable one. The second layer is the information-processing style, which is less stable and more susceptible to change. This is the process that the person goes through in assimilating information. The outermost layer of the onion is the person's preferred environment for learning. This is the least stable and most readily influenced layer of a person's learning style. Claxton and Murrell (1987) added a fourth layer between the information-processing style and preferred environment. This in-between layer represents social interaction and deals with how learners tend to interact and behave in a group. This extra layer is especially important in workplace contexts, because interaction is one of the most important sources of learning at the workplace. Figure 5 shows the onion with four layers.

Grigorenko and Sternberg's (1997) categorization is very abstract. The activity-centered approach meets our comprehensive definition of learning styles best. Rayner and Riding's and Curry's further division could then provide a useful categorization. However, this more detailed categorization of the activity-centered approach does not fit our definition of on-the-job learning styles. Because we consider on-the-job learning styles in a behavior model, thus concerning learning processes, only the two middle layers of the onion could be appropriate. In addition, our definition articulates that learning styles are a tendency to learn in a particular way (the learning process) stemming from a mixture of preferences and perceived capabilities. It is a combination of learning strategies that a person (in his or her own view) can, and likes to, perform. In Rayner and Riding's and Curry's categorization, some style dimensions concern preferences and other dimensions concern learning processes or cognitive aspects. These issues are considered

separately and are not treated as a mixture. The layer added by Claxton and Murrell (1987), social interaction, could be useful for our purpose but needs supplements, because a lot, but not all, of on-the-job learning occurs through social interaction. Grasha (1983) offers a framework that includes a social interaction category, which is called “interpersonal styles,” and other relevant categories.

Grasha’s Categorization

Grasha (1983) offers an alternative, more content-based categorization of the style literature. He divides the different style dimensions into five categories:

1. cognitive styles;
2. sensory styles;
3. interpersonal styles;
4. intrapersonal styles; and
5. environmental styles.

Cognitive styles influence an individual’s acquisition, retention, and retrieval of information. Sensory styles are the modalities through which a person prefers to acquire information (visual, auditory, etc.). Styles that derive from social interaction (roles and role expectations, imitation of models, group norms, leadership, and discourse) are called interpersonal styles. Intrapersonal styles reflect individuals’ needs and motives and the thoughts and actions directed toward self-control, for example, goal setting and establishing deadlines. The use of external feedback and reinforcement, the physical environment in which learning occurs, and formal structures used to promote learning are categorized as environmental styles.

We defined learning styles in terms of activities, because awareness of concrete activities in the learning process provides opportunities for improvement of on-the-job learning. The categories of sensory and environmental styles are not activity related. The other categories (i.e., cognitive styles, interpersonal styles, and intrapersonal styles) seem relevant. Together, however, they do not offer a comprehensive framework.

We support the presence of an interpersonal category. Only few authors in style research have taken interpersonal learning aspects into account (Berings & Poell, 2002), although learning, and especially on-the-job learning, is a social process. Knowledge and skills have a social life, in that they originate in and can be distributed only through social interactions (Brown & Duguid, 2000). Even learning that seems an individual process almost always entails some social mediation (Salomon & Perkins, 1998).

The category of intrapersonal styles could be used to describe the activities employees can, and like to, perform on their own. In that case, this category should be used in a more narrow meaning than Grasha (1983) origi-

nally intended, because motives and needs are not activities and, therefore, do not match our definition of on-the-job learning styles.

Furthermore, there seems to be an overlap between the dimensions of intrapersonal and interpersonal styles and the third residual dimension, cognitive styles. Cognitive styles refer to an individual's acquisition, retention, and retrieval of information in both individual and social learning situations. They refer to mental activities.

All categorizations described above focus on mental learning activities or preferences. The literature on learning style in educational settings pays little attention to overt activities, which is probably because overt activities in educational settings are mostly directed by teachers and are not chosen by the learners themselves. In on-the-job learning, employees mostly choose their own learning activities. Therefore, beside having an awareness of mental activities, it could also be useful for employees to gain more awareness of their overt learning strategies. What are the concrete activities employees tend to perform to reach a learning goal? Thus, paying attention to overt activities seems to be very relevant in researching on-the-job learning styles.

A New Categorization of On-the-Job Learning Styles

A categorization of on-the-job learning style dimensions needs adaptations of Grasha's categorization. The new categorization should address on-the-job learning processes in terms of activities, stemming from a mixture of preferences and perceived capabilities. Similar to Grasha's (1983) framework, a distinction should be made between intrapersonal and interpersonal learning styles. Furthermore, in addition to mental activities, it should also include overt activities. Therefore, the categorization we propose combines the distinction between intrapersonal and interpersonal activities with the distinction between mental and overt activities (as indicated in Table 1). The categorization we propose distinguishes different types of learning activities. Each cell of the categorization, or each type of activity, contains a number of different dimensions of on-the-job learning activities. In literature on educational psychology, learning style characteristics are usually described in bipolar or multipolar dimensions. However, for the sake of coherence, we defined the different dimensions contained in each cell of our categorization one-dimensionally, as is common in literature on on-the-job learning. In our opinion, on-the-job learning styles should not be defined as bipolar dimensions that exclude one another but as singular dimensions of which people possess few or many characteristics (cf. Riding & Cheema, 1991; Vermunt, 1992).

In the learning style literature, mostly mental learning style characteristics are described, usually defined in bipolar or multipolar dimensions. In our categorization, for instance, Riding's (1991) wholist-analytic style dimension would be categorized as referring to mental intrapersonal activi-

TABLE 1: New Categorization of On-the-Job Learning Style Dimensions

	Intrapersonal Activities	Interpersonal Activities
Mental Activities (e.g., the extent to which employees . . .)	<ul style="list-style-type: none"> • assimilate • explore • view learning and work situations holistically • reflect on their actions 	<ul style="list-style-type: none"> • depend on other people • are inclined to work with other people • strive for competition • reflect on others' actions
Overt Activities (e.g., the extent to which employees . . .)	<ul style="list-style-type: none"> • seek information on the Internet or from other sources • practice new skills • keep up with specialist journals • create action plans 	<ul style="list-style-type: none"> • seek feedback • collaborate • ask others for information • exchange knowledge and experiences • observe others

ties. This dimension describes whether people view situations as a whole or as a collection of parts, only stressing one or two aspects at a time. Another example of a style dimension that would fit in this category is the distinction between assimilators and explorers (Kaufmann, 1979). Extreme assimilators always seek familiarity and structure. They try to adapt to a situation by fitting the situation into standard schemes. Extreme explorers seek novelty and dislike structure. They seek new solution alternatives spontaneously, even when faced with problems that can be solved by applying standard schemes. This example perfectly matches distinctions that have been made in the workplace learning literature. For instance, Ellström (2001) distinguishes between adaptive and developmental learning. The learning style literature pays little attention to interpersonal characteristics of learning styles. One example of a dimension that describes mental interpersonal learning activities is dependence on other people and the inclination to collaborate with them (see also Riechmann & Grasha, 1974).

The literature on on-the-job learning mostly focuses on overt learning activities (e.g., Eraut et al., 1998; Gerber, 1998). These activities are usually described one-dimensionally. Overt intrapersonal learning activities are the activities that a person tends to perform alone, such as finding information in the library or on the Internet. Overt interpersonal learning activities are the activities that a person undertakes together with, or with the help of, other people, such as feedback seeking (London & Smither, 2002) or manners of collaboration.

Now that we have defined and categorized on-the-job learning styles, the remaining issue in the conceptualization of on-the-job learning styles concerns the practical implications. How can knowledge about on-the-job learning styles be used in organizations?

Implications for Improving On-the-Job Learning

We believe that organizations and employees can benefit from an awareness of the employees' learning styles. People learn all the time; it cannot be avoided (Elkjaer, 2004; Simons, van der Linden, & Duffy, 2000). To a larger or smaller extent, they are engaged at work in "implicit or explicit mental and/or overt activities and processes, embedded in working and work-related performance, leading to relatively permanent changes in knowledge, attitudes or skills" (Berings & Doornbos, 2003, p. 48). They have different learning styles and therefore actualize different learning strategies. Most people are highly unconscious of their learning style (Boekaerts, 1996). The main part of on-the-job learning processes and outcomes generally remains implicit. In one sense, that is a good thing: People would get an overload of information if all their learning processes and the complexity of the outcomes were made explicit. On the other hand, opportunities for improvement of on-the-job learning should not be disregarded.

Awareness of On-the-Job Learning Processes

We believe that awareness of on-the-job learning styles can support employees' on-the-job learning (cf. Berings & Poell, 2002; Desmedt & Valcke, 2003; Kolb, 1974; Pheiffer, Andrew, Green, & Holley, 2003; Sadler-Smith, 2001b). People can improve their way of learning only if they know *that* and *how* they learn. They should be conscious of their learning (Barrie & Pace, 1998; Kolb, 1974; Simons & Ruijters, 2004). Therefore, to improve their work-related learning, employees should gain awareness of their on-the-job learning styles. Self-awareness is "the degree to which people comprehend their own strengths and weaknesses and what they could become" (London, 2003, p. 276) and offers people the ability to recognize their presuppositions, opportunities, and boundaries. It empowers people to make the most of their opportunities and to recognize the true reasons for their failures and successes, so they can consider them in the future and choose challenging but realistic goals.

Being aware of their on-the-job learning styles offers people a lexicon that enables verbal expression of individual differences in their learning behavior (Coffield et al., 2004; Desmedt & Valcke, 2003). It enables them to self-direct their learning, enables them to reflect on the learning strategies they choose, can make learning outcomes sharable, and can make critical learning possible (Coffield et al., 2004). Furthermore, it can offer people a feeling of satisfaction and pride (Apter, 2001) and makes the creation of new knowledge possible (Nonaka & Takeuchi, 1995). The reflection that can emerge can be regarded as reflection-on-action in the sense that it happens after its conclusion and that not only the learning outcomes are evaluated but also the way these outcomes are achieved (cf. Cortese, 2005).

In conclusion, awareness of on-the-job learning styles and learning outcomes offers employees opportunities for more efficient and better on-the-job learning.

Apart from the individual employee, managers, HRD practitioners, and colleagues can also use knowledge of employees' on-the-job learning styles. For example, managers and HRD practitioners can use this information to improve communication and build strong teams. A study by Poell, Berings, and van der Krogt (2004) in the healthcare sector shows that, currently, HRD practitioners use relatively few strategies to customize their interventions to individual employees. If they are aware of the employees' on-the-job learning styles, these HRD practitioners could customize their strategies and offer employees better guidance, that is, guidance suitable to the individual employee's learning style. Colleagues can compare their learning styles, helping them to understand each other's learning perspectives better. When two people approach a problem from opposite angles, they will suggest different solutions. This can be irritating but is less so if they know that they have different learning styles (Briggs Myers, 1962). Used in a group setting, knowledge of on-the-job learning styles enables team members to understand how the team functions effectively and where the team may need outside assistance. Group members' understanding of each other's strengths and weaknesses can enhance group development processes (London, 2003). Although people are inclined to collaborate with others who have similar learning styles (Martin & Halstead, 2001), it can be enriching to collaborate with people who have different learning styles as well. Authors of learning style literature do not agree as to whether knowledge about employees' learning styles should be used for recruitment, selection, or promotion at work (Coffield et al., 2004). Kolb (2000), for instance, suggests that certain professions should attract people with certain learning styles. Honey and Mumford (1989), on the other hand, counsel against this practice (Coffield et al., 2004).

In summary, reflecting on one's learning style and the resulting knowledge may provide awareness of the learning process in relation to the content of what was learned. This offers opportunities for improvement of on-the-job learning, which in turn can contribute significantly to the efficiency and effectiveness of organizations (Barrie & Pace, 1998).

Using Awareness of On-the-Job Learning Styles

Above, we argued that individuals' awareness of their on-the-job learning styles, and thus their habitual use of on-the-job learning strategies, may increase job efficiency. This section deals with the different ways in which people can cope with this awareness. Employees can benefit from being aware of the consequences of their learning styles and of the alternative learning modes available to them (Berings & Poell, 2002; Kolb, 1974;

Sadler-Smith, 1999, 2001a, 2001b). Job efficiency increases when employees, their colleagues, and managers are aware of their own and each other's learning styles and of the learning opportunities provided by their job (Coffield et al., 2004; van der Sluis-den Dikken, 2000). However, once they have become aware of their own and other possible on-the-job learning styles, how should employees deal with this awareness? And how could organizations deal with this awareness?

In the next section, we distinguish four ways of dealing with this awareness. The first is that awareness can be used to reinforce the use of particular learning strategies that are generally considered as best practices. The second is that it offers opportunities for (self-)reflection about one's strengths and weaknesses. Third, it can help to acquire a varied repertoire of learning strategies, to use in different learning situations. And fourth, people can adapt these different learning strategies to different learning situations. This most comprehensive way of dealing with awareness of learning styles is called "adaptive flexibility."

Encouraging particular learning strategies. Some authors (e.g., Kolb, 1984a, 2000) suggest that particular learning styles should be encouraged. This can be regarded as a plea to change employees' on-the-job learning styles by training them to adopt certain, perhaps nonhabitual, learning strategies. The relevance of such change is supported by the literature suggesting that on-the-job learning styles have a significant effect on on-the-job learning outcomes (e.g., Furnham, Jackson, & Miller, 1999; Hayes & Allinson, 1997; Jackson, 2002). The strategies represented by these learning styles could be encouraged. For example, in a sample with 200 tele-sales employees, Furnham et al. (1999) found a relationship between learning styles using the Learning Styles Questionnaire (Honey & Mumford, 1989) and development and performance. They reported a positive correlation of development and performance with the "theorist" learning style, and a negative correlation of development and performance with the "reflector" learning style. van der Sluis-den Dikken (2000) suggests that learning styles are related to perceived career development and subjective and objective job performance.

There are four reasons for reserve in valuing certain overt and mental learning styles above others. First, in educational contexts, where more research has been done on learning styles and strategies, researchers have not been able to identify, and agree on, the learning styles most relevant to learners (Curry, 1991). Second, it can be questioned whether these existing instruments are well suited to measure the concept of on-the-job learning styles (Berings & Poell, 2002). Third, the indistinct notion that some on-the-job learning styles are better than others disregards the significant influences of personal characteristics like individual abilities and preferences. And fourth, the effects of style on performance are dependent on the nature of the learning situation (Cassidy, 2004).

Reflection about one's strengths and weaknesses. Concerning the reservations in the desirability of the encouragement of particular learning strategies, indications for optimizing the use of learning strategies could be provided on a more individual level. The awareness of on-the-job learning styles could be used for reflection about one's strengths and weaknesses. Just as the learning styles of students call for different instructional styles (Beutell & Kressel, 1984; Vermunt, 1992), various on-the-job learning styles of employees call for different learning possibilities and, therefore, different material facilities and treatment by their colleagues and managers. To stress someone's strengths, the environmental conditions matching his or her learning styles should be available (Witkin et al., 1977). This way of dealing with awareness of on-the-job learning styles is based on Aptitude-Treatment-Interaction theory (Cronbach & Snow, 1977), which assumes that people learn best if they are able to use their habitual strategies. On the other hand, a mismatch in learning style and learning situation, or constructive friction, can also offer opportunities for growth (Grasha, 1983; Kolb, 1984a; Vermunt & Vermetten, 2004). People can be encouraged to overcome their weaknesses by practicing nonhabitual learning strategies. For example, employees who have a tendency to be very analytic could be encouraged to look at the whole picture by having them supervise a small project. This could improve their performance (Barker & Barker, 2001). More research is needed to find out if or when "matching" or "mismatching" strategies are most appropriate. This is a complicated task, because the few studies that have been conducted show no uniform reaction (Juch, 1983; Smith, Sekar, & Townsend, 2002).

Juch (1983) argues that people naturally sense only what they want or need to perceive. They often tend to reinforce their own innate or initial preferences and neglect those abilities that are harder to develop. In other words, most people will prefer to stress their strengths rather than overcome their weaknesses. But is this the best way to deal with this awareness? Should employees strengthen the positive aspects of their learning style, or should they overcome their weaknesses and learn new learning strategies?

Developing a varied repertoire and adaptive flexibility. The third and fourth approaches in using awareness of on-the-job learning styles are less confusing and more accepted in the literature. In the former approach, whether it was about stressing strengths or overcoming weaknesses, it is suggested that an awareness of learning styles is brought about by adapting the learning environment to the employee's learning style. However, in practice, for many reasons, it is not always possible for employees or their manager to change the learning situation and possibilities. Therefore, employees should be able to adapt their learning strategies to the learning environment. They need to develop a broad variety of learning strategies (cf. Grasha, 1983; Kirby, 1988). Furthermore, they should be able to adapt their use of the various learning styles in their repertoire to particular learning situations. In other words, they need to obtain a

high degree of adaptive flexibility. Adaptive flexibility is “the degree to which one changes his or her learning style to meet the varying learning demands of different situations” (Kolb, 1984b, p. 10). Boyatzis and Kolb (1993) developed an instrument to measure adaptive flexibility. Although their empirical findings do not support the influence of adaptive flexibility on learning skills, they suggest that this relationship may exist (Mainemelis, Boyatzis, & Kolb, 2002). If employees have a broad repertoire of learning strategies and if they are flexible in using these strategies, then they are more self-directed, more able to adapt their attitude and behavior to different learning situations, and thus become better learners (Kolb, 1984a). Ertmer and Newby (1996) and Weinstein and van Mater Stone (1996) call people expert learners to the extent that they have a broad repertoire of learning strategies, combined with meta-cognitive knowledge of when and how to use these strategies, and the flexibility to change their strategy whenever necessary. People who are unaware of their learning styles are unlikely to start learning in new ways (Merrill, 2002). According to Sadler-Smith (2001a), employees can be taught to monitor their choice of different learning strategies.

In each dimension of on-the-job learning styles, various overt and mental learning strategies can be actualized, from which the employee can choose. It is not possible to ascertain a priori whether one is better than another. In various learning situations, the use of different learning strategies can be appropriate (Berings & Poell, 2002). Although each style can be equally good for problem solving, each style is likely to be associated with greater efficiency in specific tasks (Schmeck, 1988). For example, in some situations, employees should assimilate and in other situations they should explore (Kaufmann, 1979). Take, for instance, nurses who have problems with a specific drip system. They should assimilate to this system in a situation where they need to use it quickly on a patient. In a meeting with their colleagues, they should try to explore their working with this drip system, for instance, by rewriting the system’s protocol, to prevent problems on future occasions. In some situations, employees should instantly seek feedback in the case of uncertainty; in other situations, it is better to wait for more appropriate circumstances. Take police officers, for instance. Uncertainties in writing their end-of-shift reports can best be discussed immediately with their partner. However, uncertainties in verbally addressing hooligans had better not be discussed while arresting them, but before (if this is to be anticipated) or afterward. In different learning situations, different on-the-job learning strategies can be more appropriate, but the best strategy in each situation is also dependent on the person’s learning style.

A good way of using knowledge of on-the-job learning styles for employees could therefore be to organize a coaching session, together with their supervisor, HRD professional, or peer-colleagues, and reflect on their own use of learning strategies in different learning situations. In this small group, different alternative learning strategies can be discussed. New learn-

ing strategies in addition to their current personal preferences can be tried and developed in the everyday working and learning process, to develop a varied repertoire of learning strategies and adaptive flexibility.

The concept of adaptive flexibility shows the value of having an understanding of one's on-the-job learning style, of other possible styles, and of how different situations require different approaches. If employees can be made aware of their habitual combination of learning strategies (their on-the-job learning styles) and of other possible learning strategies, they will learn to recognize these situations and adapt their attitude and behavior to the specific learning situation. They can adapt the learning strategy that they actualize to fit each new situation. Unfortunately, there is no empirical evidence, yet, to support the assumptions above (Coffield et al., 2004).

Conclusion and Discussion

We can conclude that a number of supplements to a general definition of learning styles are needed for the concept to be feasible in on-the-job situations. A definition of on-the-job learning styles should emphasize the specific on-the-job learning situation and the difference between explicit and implicit learning. On-the-job learning styles are therefore defined as the tendency to use a particular combination of implicit and explicit learning activities that a person can, and likes to, perform on the job. The person adapts the combination of learning activities to each situation differently. This particular combination is called the actualized learning strategy. In the categorization of on-the-job learning styles, attention should be paid to both mental and overt learning styles and to both interpersonal and intrapersonal learning styles.

Organizations and employees can benefit from an awareness of the employees' on-the-job learning styles, by trying to develop an adaptive flexibility in using on-the-job learning strategies. It is expected that a higher level of adaptive flexibility will lead to an improvement of the employees' on-the-job learning.

In this study, we used theory from the educational psychology and workplace learning literatures to conceptualize on-the-job learning styles. We realize that the topic of on-the-job learning has connections with other disciplines as well, such as work and organizational psychology and management sciences. However, we expect to have covered the most relevant literature on the topic in this study. We also realize that the conceptualization of on-the-job learning styles that we proposed in this study should be verified with empirical evidence. First, more research is needed to distinguish the different aspects of on-the-job learning styles in all cells of the categorization. Then, further research could address specific research methods that can be used to support and specify our conceptualization of on-the-job

learning styles empirically and to investigate the use of different on-the-job learning strategies in different learning situations. At this time, no learning style instruments are available that are well suited to on-the-job learning situations (Berings & Poell, 2002). We encourage the development of research methods that include research instruments covering both overt and mental on-the-job learning styles and both interpersonal and intrapersonal on-the-job learning activities. The method should focus not only on the dominant on-the-job learning strategies that people use. It should also emphasize the broadness of their learning repertoire and their flexibility in using different on-the-job learning strategies, that is, adaptive flexibility. Using such a research method, it should be possible to identify the individual learning styles of employees, thus offering them opportunities to improve their performance. In addition, it would be very useful to empirically investigate whether a higher level of adaptive flexibility actually leads to an improvement of employees' on-the-job learning or whether other suggested ways of dealing with awareness of on-the-job learning styles would be better. Are some learning styles better than others in particular learning situations? Finally, it would be very useful to investigate the specific characteristics of the on-the-job learning situation that stimulate adaptive flexibility and how such a learning situation could be created.

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