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Henrik Kock and Per-Erik Ellström

N.B.: When citing this work, cite the original article.

Original Publication:

Henrik Kock and Per-Erik Ellström, Formal and integrated strategies for competence development in SMEs, 2011, Journal of European Industrial Training, (35), 1, 71-88.

<http://dx.doi.org/10.1108/03090591111095745>

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Postprint available at: Linköping University Electronic Press

<http://urn.kb.se/resolve?urn=urn:nbn:se:liu:diva-64341>

Formal and Integrated Strategies for Competence Development in SMEs

Henrik Kock, Linköping University, Sweden
Per-Erik Ellström, Linköping University, Sweden

Abstract:

Purpose – The purpose of this paper is to increase our understanding of the relationships between the workplace as a learning environment, strategies for competence development used by SMEs and learning outcomes. Specifically, there is a focus on a distinction between formal and integrated strategies for competence development, the conditions under which these strategies are likely to be used, and their effects in terms of individual learning outcomes.

Design/methodology/approach – The study was based mainly on questionnaire data collected through a survey of 14 SMEs that had received support from the European Social Fund's Objective 3 programme. In addition, data collected through interviews and analyses of documents were used.

Findings – The results indicate interactions between the strategy of competence development used by the firms (formal vs. integrated) and the type of learning environment in the workplace (constraining vs. enabling). The use of an integrated strategy in an enabling learning environment was the most successful combination in terms of learning outcomes, while the use of an integrated strategy in a constraining learning environment was the least successful combination.

Research implications/limitations – There is a need to elaborate the theoretical and empirical basis of the distinction between formal and integrated strategies for competence development, and to study the effects of the two types of strategy, not only for individual learning outcomes, but also for effects at an organizational level.

Practical implications – HRD practitioners need to question a traditional reliance on formal training, as the presented results indicate the importance of using competence development strategies that are based on an integration of formal and informal learning.

Originality/value – The study indicates that the effects of competence development efforts are likely to be a function not only, or primarily, of the training methods and strategies that are used, but also a function of the characteristics of the learning environment of the workplace.

Keywords – HRD, competence development, learning environment, learning outcomes, SMEs, Sweden.

Paper type – Research paper

Introduction

There is currently a strong interest in the workplace as a site for education and training – an interest that has also generated a considerable amount of research over the last decade (e.g. Boud and Garrick, 1999; Rainbird et al, 2004; Nijhof and Niuwenhuis, 2008). Workplace learning activities is in many circles viewed as a key factor behind productivity development, innovative capacity and competitiveness. This standpoint is not only an outflow of policy discussions about knowledge or learning economies, but has also received considerable support from research (e.g. Lorenz & Lundvall, 2006). Recent studies indicate for example that learning and competence-building in the workplace are important factors for promoting innovation performance at the level of the firm (e.g. Lorenz & Valeyre, 2005).

However, in spite of the expectations that exist regarding the workplace as a site for learning, there is a marked lack of empirically-based research on competence development in companies and other organizations. Much of the research on workplace learning has had a focus on informal learning at work, rather than on planned efforts at competence development (Ellström, forthcoming). Furthermore, research on learning and competence development at

work tends to have a certain bias towards larger enterprises, while research specifically on small and medium-sized enterprises (SMEs) has been limited (Hill, 2004; Coetzer, 2006). Available research on competence development in SMEs shows however that competence development takes place in many different forms and under diverse conditions (Kitching & Blackburn, 2002; Matlay, 2002; Saru, 2007). It also seems apparent that SMEs differ in the importance they attach to competence development and their opportunities to take on such practices (Kitching, 2008; Ram, 2000).

Previous research on workplace learning in organisations has underlined the need to consider both external and internal contextual conditions in order to reach an understanding of why and how competence development is initiated and accomplished and with what outcomes (Ellström & Kock, 2009; Jackson & Schuler, 1995; Salas & Cannon-Bowers, 2001; Kelliher & Henderson, 2006). In line with this, we were, in a previous study, able to demonstrate the importance of external and internal conditions as driving forces for training in SMEs (Kock, Gill & Ellström, 2008). A distinction was made between two types of contextual conditions, external conditions related to factors such as competitive pressure and customer demands, and internal conditions related to the organisation. The study showed a significant relationship between the rated strength of contextual conditions and the type of strategy used by the company. Firms evaluating the contextual conditions as weak driving forces for competence development more frequently used a formal strategy (focused on formal courses in or outside the workplace), while firms evaluating the contextual conditions as strong driving forces used an integrated strategy for competence development (focused on formal courses in combination with changes of the work organisation).

Considering specifically internal conditions for education and training in organizations, there are strong indications that the effects of competence development efforts seem to be related to the possibilities for continuous learning in and through work. In companies that are characterized by a rich learning environment (e.g. the complexity of the tasks calls for continuous learning) effects are reported to a greater extent than in companies where the conditions for on-the-job learning do not appear so favourable (e.g. Ellström & Kock, 2009; Pettigrew et al., 1988; Skule & Reichborn, 2002).

The purpose of this article is to pursue these issues further by studying the relationships between the workplace as a learning environment, the strategies for competence development used by SMEs and reported learning outcomes. More specifically, the following three questions were addressed:

- (1) Is the strategy for competence development used by a firm related to characteristics of its learning environment? In particular, is a certain strategy for competence development more likely to be used in a certain type of learning environment?
- (2) To what extent are perceived learning outcomes related to the strategy for competence development used by the firm and/or to aspects of its learning environment?
- (3) What is the relative importance of the learning environment and the strategy for competence development used by the firm in relation to perceived learning outcomes?

This study is based on a research project on competence development in SMEs, where the SMEs have received grants for the competence development of employees from the European Social Fund (ESF, Objective 3). In the next section the basic concepts of strategy for competence development, learning environment and learning outcomes will be defined and related to previous research.

Theoretical Framework and Previous Research

Strategies for Competence Development

The notion of competence development is used here as an overall description of the various activities that can be used to affect the supply of competence on the internal labour market in a firm. As used here, it refers to a wide range of activities, including education and training of employees (for instance by means of internal or external courses), but also changes of the work organisation with the objective of furthering informal learning at work (e.g. job rotation, team organisation and systems for continuous improvement) (Ellström, 1997). In the HRM literature, systems of activities with the aim of developing the workforce are sometimes described as bundles of practices or as HRM systems (Guest, 1997; Michie & Sheehan, 2003). In this connection it should be pointed out that the term competence development is sometimes also used with another meaning, namely to denote the individual learning processes through which competence is developed. A distinction can therefore be made between an organisation-related and an individual-related meaning of the term competence development (Ellström, 1997; Nordhaug & Grønhaug, 1994; Delamare Le Deist & Winterton, 2005).

A number of competence development activities can be described as planned, but attention should also be paid to unplanned or unintended functions that a certain activity may have. Consequently, while studying competence development in organisations it is possible to use the degree of planning and organising as a distinction between different activities. Here, a distinction can be made between two broad categories of activities (cf. Marsick & Watkins, 1990; Marsick, Volpe & Watkins, 1999):

a) Formal learning, that is, planned and organised learning activities, mainly financed by the employer and taking place during working hours. Formal learning also implies that participants are certified or given a certain grade. In practice, formal learning is often organised through internal or external courses.

b) Informal learning in the daily work, that is, learning through participation in development projects, staff-meetings, job rotation, team-based work, etc. As used here, informal learning refers to learning that occurs regularly in work as well as in everyday life, but subordinated to other activities (e.g. work practices) in the sense that learning is not their primary goal. That is, learning while you are primarily focused on performing another task. As a learning process, informal learning in and through the daily work is characterised by a low degree of planning and organising.

From a theoretical point of view, this distinction between formal and informal learning is, in some respects, parallel to the distinction between the two perspectives or metaphors of learning proposed by Sfard (1998), that is, 'learning as acquisition' and 'learning as participation'. In the former perspective, learning is viewed as a process with an observable outcome, often accompanied by certification or grading on a course or a structured programme under the guidance of others. In the latter perspective, learning is a process in which learners improve their work performance by carrying out activities which involve interacting with people, tools, materials, etc. and focuses on learning activities that arise naturally as a part of the work process (Felstead et al., 2005; Fenwick, 2006).

Now, based on these distinctions and previous empirical research, we are proposing a distinction between two types of strategy for competence development. In line with Mintzberg (1994), the notion of a strategy used here refers to observed patterns of practices with respect to competence development. In a previous study, we were able to empirically identify two

different patterns of practice with respect to competence development (Kock, Gill & Ellström, 2008). The first pattern was mainly based on courses for the employees in or outside the work place and focused primarily on the individual employee and his/hers ability to perform his/her job on a regular basis. This type of pattern was denoted as a formal strategy for competence development. The second pattern was characterised by a use of courses in combination with changes in the work organisation, and had a focus on the individual employee as well as on the development of the company/organisation. This type of strategy was labelled an integrated competence development strategy. An important aspect of this latter strategy is the integration between courses and changes of the work organisation. The use of an integrated strategy may increase the employees' ability to perform in their daily work, as well as increase the – usually unplanned – opportunities for the employees to co-operate, share experiences and reflect on their own work. In the remainder of this article, we will focus on these two types of strategy, the conditions under which they are likely to be used, and their effects in terms of individual learning outcomes.

Learning Environments: Enabling and/or Constraining

As used here, the concept of learning environment refers to conditions in an organisation that are likely to enable or constrain learning in and through work (Ellström, 1997; 2001; Ellström et al., 2008; see also Billett, 2001; Fuller and Unwin, 2004). These conditions can be structural, that is, constituted by material, cultural or social structures in the organisation, or related to the character of work processes and practices. If we specifically consider the cultural dimension, the concept of learning environment comes close to the concept of learning culture as used by e.g. Dymock (2003) and Watkins and Marsick (2003). The learning environment of an organisation is assumed to affect not only the degree of employee learning in certain dimensions, but also the quality of learning (e.g. whether the learning is mainly reproductive and instrumental or developmental in character, Ellström, 2006). When we in the following refer to two types of learning environment, called enabling and constraining, we consider them as two ideal typical constructions, that is, as idealised forms that constitute the two extremes of a continuum of learning environments. In practice, we assume that a certain learning environment may include conditions that are enabling for learning as well as conditions that may constrain learning. Thus, in practice, many learning environments are presumably of a mixed type.

Ellström (2001; 2006a) discusses various conditions in organisational settings that are important for learning, and depending on the degree to which these conditions characterise a certain organisational context, this context constitutes an enabling or constraining environment for learning. Examples of such conditions are:

- The learning potential of the work tasks defined in terms of job characteristics such as degree of complexity, task variety, and scope of action (control).
- Opportunities for feedback, evaluation and reflection on outcomes of work actions.
- The formalization of work processes, including a work organisation supportive of co-operation and learning.
- Employee participation in problem handling and development activities, including participation in the planning and implementation of competence development efforts.
- Learning resources, including time and management support for competence development.

An enabling learning environment would, in terms of these conditions, be characterised by work tasks with a high degree of learning potential; opportunities for feedback, evaluation and

reflection; learning resources, etc. In cases where these conditions are less favourable, we would consider these cases as instances of a constraining learning environment. Fuller & Unwin (2004; 2006) make a similar distinction between expansive and restrictive learning environments. A restrictive learning environment is characterised by less stimulating work tasks, barriers to learning new work tasks and lack of organisational support, while an expansive learning environment is supportive of individual and organisational learning, and is defined in terms of more stimulating work tasks, opportunities to learn new work tasks, and manager's recognition of learning.

In this paper, we will focus on the character of learning environments (constraining and/or enabling) by exploring how different organisational conditions were perceived by the respondents in each of the companies included in the study. More specifically, we will focus on the following conditions: qualification requirements, potential for learning at work, management support for learning, and teamwork.

Learning Outcomes

Research on the effects of competence development in organisations is very much a field in need of further theoretical and empirical work. Many of the methods that are currently in use in evaluation and research on outcomes of competence development and training efforts in organisations are based on Kirkpatrick's typology (Kirkpatrick, 1959). This typology is based on four levels of outcomes: participants' reactions, learning, behaviour change and organizational outcomes. This typology has been criticized for conceptualizing outcomes of competence development as excessively linear and technical-rational. Several alternative methods for conceptualizing and measuring learning outcomes have also been proposed (e.g. Kraiger, Ford & Salas, 1993; Kozlowski & Salas, 1997; for a critical discussion of the concept of learning outcomes, see Hussey & Smith, 2002). In spite of considerable, and to a large extent well founded, criticism, the Kirkpatrick typology is widely recognised as a useful general framework for conceptualising learning outcomes (e.g. Phillips & Phillips, 2001).

Learning outcomes could, in general terms, be defined as change at an individual, group, or organisational level as a result of participation in some form of training or competence development programme in an organisation. In this study, we have focused on changes at an individual level. The changes may apply to knowledge, skills, values, behaviour, or some other aspect of human competence (Ellström, 1997). More specifically, we will use the concept of learning outcomes to refer to how individual participants in a competence development programme perceive the outcomes of the programme in relation to changes in their professional competence, their overall view of the business, their ability to carry out new work tasks, their motivation for further learning, and their self confidence.

The general definition of learning outcomes given above builds on a view of training and competence development as an objective, goal-steered process with certain external, causally determined outcomes (effects) for the participants. Such outcomes may arise in the long or short term, be general or more task-specific, intentional or unintentional, desirable or undesirable. This definition of educational effects has its roots in a technological-functional view of education, and can of course be questioned, not least from an institutional perspective on learning or educational outcomes (e.g. Meyer, 1977).

Analytic Framework

The focus of this article concerns what we have denoted the learning triangle, that is, the relationships between the learning environment of a firm, the strategy for competence development used by the firm and perceived learning outcomes. The relations between these

three basic concepts are illustrated in Figure 1 below, and we have used this simplified framework (“the learning triangle”) as a guide for analysing data.

Figure 1 about here

A main assumption behind the framework as illustrated in Figure 1 is that the learning outcomes of a competence development effort (e.g. a certain training programme or course) are assumed to be dependent on: (a) the character of the learning environment; (b) the strategy for competence development used, and (c) the interaction between these two factors. Of course, and this is an important point, although we assume that there are relations of functional dependency between learning outcomes and the two independent variables, we can not on the basis of this study infer causality. Rather, the relationships in Figure 1 are correlational in character. Thus, in interpreting the results presented below it should be taken into account that, for example, perceptions of learning outcomes may have influenced the perceptions of the learning environment, and vice versa. However, this does not apply to the relationships between the factor strategy for competence development and that of learning outcomes. This is the case because the strategy for competence development used by the firm is defined independently of learning outcomes mainly on the basis of interview data.

Several important aspects are not included in the framework as illustrated above. First, factors and conditions tied to the individual, such as motivation to learn (Colquitt, Le Pine & Noe, 2000) and previous experiences of competence development (Hodkinson & Hodkinson, 2006) are not included in this framework. Second, a number of contextual factors are not taken into explicit consideration, for example conditions related to the labour market and the rate of technological development in the branch (Ellström & Kock, 2009).

The concept of learning environment as used here is defined in terms of four groups of variables: qualification requirements, the opportunity to learn in the daily work, management support and teamwork. The learning outcomes are defined in terms of seven variables. These measures and the construction of indices are further described below in the section on “Methods”.

The distinction between the two types of strategy for competence development was introduced in a previous paper (Kock, Gill & Ellström 2008). The firms were categorized as using a formal or an integrated strategy based on analyses of planning documents and qualitative interviews with management and employees. A firm was categorized as using a formal strategy if there was an emphasis on the use of internal and/or external courses, and if the training had a focus on individual skill development and the improvement of the employees’ ability to perform their day-to-day work. A firm was categorized as using an integrated strategy if there was a focus not only on the single employee and his or her skills, but also on other aspects on the business. An integrated strategy can be described as aiming to integrate employees’ skills through external/internal courses in combination with changes in work tasks and work organisation, quality development, etc. (Kock, Gill & Ellström 2008). Thus, an integrated strategy combines formal courses and informal learning at work.

Methods

This article is based on data from a sample of 14 SMEs that all received support from the European Social Fund (the Objective 3 Programme) for the planning and conduct of competence development activities. As was prescribed by the legislative framework for the Objective 3 Programme, the grants should target competence development of employees and/or organisational development in SMEs, at both private and public workplaces. Data for this study were collected mainly through a questionnaire, but also through qualitative interviews with management and employees, and analyses of documents. However, the results presented in this article is to a large extent based on the questionnaire.

The questionnaire was distributed to employees in the sample of 14 SMEs. This sample was drawn from a list of SMEs in three regions in the south of Sweden that had received ESF Objective 3 funding. The criteria used to select the SMEs included in this study were formulated based on a discussion with representatives of the Objective 3 programme offices in the three regions. The method for selection of firms can be described as “purposive” (Miles & Huberman, 1994), and the selection criteria aimed to give an appropriate variation in size, ownership (public–private), type of production (manufacturing–services) and gender.

The selected SMEs had completed their planned competence development activities within a period of 3-6 months before they received the questionnaire. The survey was targeted towards employees directly involved in competence development projects and we received a total of 151 responses, with a response rate of between 57-100 per cent (average: 78 %). The selected companies varied in size, from 10 to 60 employees. Table 1 presents a background profile of the sample.

Table 1 about here

The questionnaire was designed to collect data concerning several aspects of the firm, with a focus on the factor in the framework presented in Figure 1 above, that is, the learning environment of the firm, the strategy for competence development used, and the learning outcomes from competence development. More specifically, the following variables or groups of variables were included in the questionnaire:

- Background variables concerning firm size, composition of staff, experiences from previous competence development efforts.
- Aspects of the learning environment of the enterprise: work tasks (complexity, variety, autonomy), competence demands, management support for competence development.
- Participation of employees in the planning and implementation of the competence development programme.
- The roles of specific actors such as managers and union representatives.
- Methods used in the competence development programme.
- Perceived learning outcomes from competence development activities.

To be able to describe the learning environment of each firm an index of the learning environment was constructed based on five variables: qualification requirements (5 items), opportunities to learn in the daily work (one item), management support (one item) and teamwork (two items).

The learning outcomes at the individual level were measured in terms of seven variables: (1) professional competence, (2) ability to carry out new work tasks, (3) interest in more developmental work tasks, (4) the overall view of the business, (5) useable knowledge outside the workplace, (6) motivation for further learning, and (7) self confidence. In the analyses presented below, an index evaluating the learning outcomes was used. This index variable was constructed from the mean values of the seven variables measuring learning outcomes.

The survey questions regarding aspects of the learning environment and the learning outcomes were all measured by Likert-type scales. As a first step, all variables were normalised and the composite measurements were transformed into z-scores. By using the mean as a divider, the learning environment was categorised into two groups: an enabling learning environment group and a constraining learning environment group. The companies' use of certain competence development strategies was categorised in two groups: a formal

learning strategy and an integrated strategy based on analyses of documents and interviews with representatives of the management and employees in the firms (see also Kock, Gill & Ellström, 2008). Examples of courses included product and service quality, production technology, ICT, foreign languages, business administration and communication. In the case where an integrated strategy was used, courses were combined with organizational development, the introduction of team-based organization or implementation of a new quality system.

The first research question was analyzed by conducting a series of independent *t*-tests. In order to answer questions two and three several different statistical tests can be used (Hinkle, Wiersma & Jurs, 1998). In order to analyze the effects of the two independent variables (learning environment and strategy for competence development) on a set of dependent variables (learning outcomes) an ANOVA 2 x 2 fixed-effects model was used. In this way it was possible to analyze the main effects of the two independent variables as well as their interaction effects.

Results

In the text below, the results will be analyzed and presented in relation to the three research questions of the study. For further information concerning the questionnaire and the variables included in the data collection, see the Appendix.

Is the Strategy for Competence Development Used by a Firm Related to the Character of its Learning Environment?

This first research question concerns the character of the learning environment in which a certain strategy for competence development is used. Specifically, is a certain strategy for competence development more likely to be used under certain environmental conditions than under others? In order to shed light on this question, four aspects of the learning environment in the firms were considered: qualification requirements, opportunities for learning in and through the daily work, management support and teamwork (see Table 2, below). Independent samples *t*-test were used to identify significant differences between the two strategies in terms of these four aspects of a learning environment.

Table 2 about here

As shown in Table 2, the mean values concerning aspects of the learning environment are generally higher among firms using an integrated strategy for competence development. As indicated by the results, there were six significant differences between the two strategies: four with respect to different qualification requirements and two related to management support and teamwork, respectively.

Turning back to the previously made distinction between a constraining and an enabling learning environment, the SMEs using an integrated strategy for competence development appear to have a more enabling learning environment compared to the SMEs using a formal strategy. Thus, the results indicate that the character of the learning environment is related to the use of different competence development strategies.

What are the Effects of Learning Environment and Strategy for Competence Development on Learning Outcomes?

The second research question concerns the extent to which perceived learning outcomes are related to the strategy for competence development used by the firm and/or to aspects of its learning environment. Thus, this question concerns the main effects of the two independent variables learning environment and strategy for competence development, respectively. In

Table 3 below we compare these two independent variables in terms of mean values of seven learning outcome measures included in this study (*t*-tests, two-tailed).

Table 3 about here

As is clear from Table 3, all mean values of perceived learning outcomes are significantly higher among firms characterised as having an enabling learning environment compared to firms characterised as having a constraining learning environment. Considering the effects of the variable strategy for competence development, the findings indicate that firms using an integrated strategy for competence development reach higher levels of learning outcomes in comparison to firms using a formal strategy.

In order to analyse the third research question concerning interactions between the two independent variables learning environment (LE) and strategy for competence development (CDS), an ANOVA 2 x 2 fixed-effects model was used. An analysis of different combinations of competence development strategy (formal/integrated) and different types of learning environment (constraining/enabling) was carried out. In Table 4 below, the results from the ANOVA analysis is presented. As described in the method section, the measure of learning outcomes used in this analysis is based on an index variable constructed from the mean values of seven variables measuring learning outcomes.

Table 4 about here

The results in Table 4 show that there was a significant main effect of learning environment in relation to learning outcomes ($p=.001$), but no significant main effect of competence development strategy in relation to learning outcomes. These results, which are consistent with the results showed in Table 3 above, underline the importance of the character of the learning environment in relation to learning outcomes, and that firms providing a more enabling learning environment report a significantly higher degree of learning outcomes compared to firms characterized by a constraining learning environment. Thus, these findings indicate that a rich learning environment (in terms of qualification requirements, learning opportunities, management support, and teamwork) was at least as important as the use of a certain strategy.

As is also clear from the results presented in Table 4, there was an interaction effect between the character of the learning environment and the strategy for competence development used by the firm ($p=.003$). This result means that different combinations of competence development strategy (formal/integrated) and type of learning environment (constraining/enabling) result in different learning outcomes. In Table 5 below, we compare the mean values of learning outcomes between four combinations of type of learning environment and competence development strategy, and test the differences between the different combinations.

Table 5 about here

If we compare the mean values of the learning outcomes between the four combinations in relation to the learning outcomes of the whole sample, the highest mean value is generated in an enabling learning environment using an integrated strategy (E/I), $M=2.65$, and the lowest in a constraining learning environment using an integrated strategy (C/I), $M=1.90$. The two other combinations, the enabling learning environment/formal strategy (E/F), and the constraining learning environment/formal strategy (C/F), result in mean values between the two former: $M=2.28$ (E/F), respectively $M=2.23$ (C/F). As is also clear from Table 5, five of the six contrasts between the means of the combinations were statistically significant.

Discussion

The purpose of this paper was to increase our understanding of the relationships between the workplace as a learning environment, the strategies for competence development used by firms and reported learning outcomes, that is, to explore the dynamics of what we have called the learning triangle.

Considering the results presented in the preceding sections, the following tentative conclusions can be made in relation to the three research questions. First, the results indicate that the competence development strategy used by the firms was related to the character of their learning environment: The SMEs using an integrated competence development strategy were characterised by a more enabling learning environment compared to the SMEs using a formal strategy. Thus, in response to the first research question, the use of an integrated strategy appears to be more likely in an enabling learning environment, while a formal strategy is more likely to be used in a constraining learning environment.

Second, the individual learning outcomes reported from participation in competence development activities appear to be related both to the character of the firm's learning environment and to the competence development strategy used by the firm. Considering the relationship between type of learning environment and learning outcomes, the results indicate that individuals in firms characterised by an enabling learning environment report significantly higher levels of learning outcomes compared to those in firms characterised by a constraining learning environment. Furthermore, this relationship appears to be stronger than the relationship between competence development strategy and learning outcomes. Although the use of an integrated strategy compared to a formal strategy is generally associated with higher mean values in terms of learning outcomes, this difference reaches statistical significance only for one of the learning outcome variables (cf. Table 2).

Third, concerning interactions between type of learning environment and competence development strategy, the results indicate: (a) that the character of the learning environment (constraining or enabling) makes little difference in terms of learning outcomes for firms using a formal competence development strategy; and (b) that this is clearly in contrast to firms using an integrated strategy, where the character of the learning environment makes a considerable difference in terms of learning outcomes. The use of an integrated strategy in an enabling learning environment is the most successful combination in terms of learning outcomes, while the use of an integrated strategy in a constraining learning environment appears to be the least successful combination.

Considering the validity of these and other findings presented above, it might be argued that the relationships that we have found between aspects of the learning environment, the strategy for competence development used by the firm and reported learning outcomes are more or less a function of common method variance, that is, a function of the use of items from the same questionnaire to measure both learning outcomes and aspects of the learning environment. It is true that we cannot exclude that this factor might have inflated the observed relationships between aspects of the learning environment and learning outcomes. However, this argument is not relevant with respect to the findings concerning the strategy for competence development used by the firm, for example, the findings that different strategies are related to different levels of learning outcome. The validity of these findings is strengthened by the fact that the strategy construct is based on interview data and documents independent of the questionnaire (for further details, see Kock, Gill & Ellström, 2008).

Implications for Research and Practice

The presented findings are clearly in line with results from previous research concerning the importance of the concept of learning environment in order to understand the learning potential of a workplace (e.g. Billett, 2001; 2004; Fuller & Unwin, 2004; Gustavsson, 2007; Nijhof and Niuwenhuis, 2008). Furthermore, the results also support the distinctions made between: (a) an enabling and a constraining learning environment proposed in this paper (see also Ellström, Ekholm & Ellström, 2008); and (b) a formal and an integrated strategy for competence development. In line with previous research (Svensson, Ellström & Åberg, 2004), the results indicate the importance of using competence development strategies that are based on an integration of formal and informal learning, that is, what we have called integrated competence development strategies. An important research implication is to further elaborate the theoretical and empirical basis of the distinction between formal and integrated strategies for competence development, and to study the effects of the two types of strategy, not only for individual learning outcomes, but also for effects at an organizational level.

Regarding the observed relationships between the character of the learning environment and learning outcomes, these results have important implications for HRD in firms. This is the case not least in relation to the frequently expressed need for companies to invest in education and training at the workplace. Based on the results presented here, an important challenge for many organizations is not to take on competence development in more restricted ways (e.g. strategies based on formal training courses), but (a) to use what we call integrated strategies, and (b) to develop also the learning environment of the workplace in terms of more stimulating tasks, changes of the work organization in order to create more opportunities for learning in and through daily work, management support for learning, etc, that is, to develop what we have called an enabling type of learning environment (for an extended discussion of the meaning of this concept and its organizational implications, see Ellström, forthcoming). In practice, these two tasks are mutually reinforcing as the use of an integrated strategy for competence development are likely to include activities (e.g. organizational development) that also support the development of a more enabling learning environment.

Appendix

Table 2

- Variables 1–5 are based on the responses given to the question: ‘To what degree have the demands on your competence been affected in recent years concerning...’. The table provides the mean value of the responses given, with 3 = ‘The demands have increased’, 2 = ‘The demands are unchanged’, 1 = ‘The demands have decreased’.
- Variable 6 is based on the responses given to the question: ‘How would you consider the possibilities to learn and develop in your daily work?’ The table provides the mean value of the responses given, with 5 = ‘Very large’, 4 = ‘Fairly large’, 3 = ‘Neither large nor limited’, 2 = ‘Fairly limited’, 1 = ‘Very limited’.
- Variable 7 is based on the responses given to the question: ‘To what degree does the management support increasing your competence?’ The table provides the mean value of the responses given, with 5 = ‘To a very high degree’, 4 = ‘To a fairly high degree’, 3 = ‘To neither a high nor low degree’, 2 = ‘To a fairly low degree’, 1 = ‘To a very low degree’.
- Variable 8 is based on the responses given to the question: ‘To what degree are the following measures used in order to increase your competence?’ The table provides the mean value and the standard deviation of the responses given, with: 4 = ‘Fully’, 3 = ‘Largely’, 2 = ‘Partly’, 1 = ‘Not at all’.

Table 3

- The table is based on the responses given to the statement: ‘The competence development programme has resulted in...’.
- The table provides the mean value and the standard deviation of the responses given, with 4 = ‘I totally agree’, 3 = ‘I agree to a large extent’, 2 = ‘I agree to some extent’, 1 = ‘I do not agree’.

Acknowledgements

The research for this paper was funded by VINNOVA (The Swedish Governmental Agency for Innovation Systems) and the Swedish ESF Council.

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Figure 1. Analytic Framework: The Learning Triangle

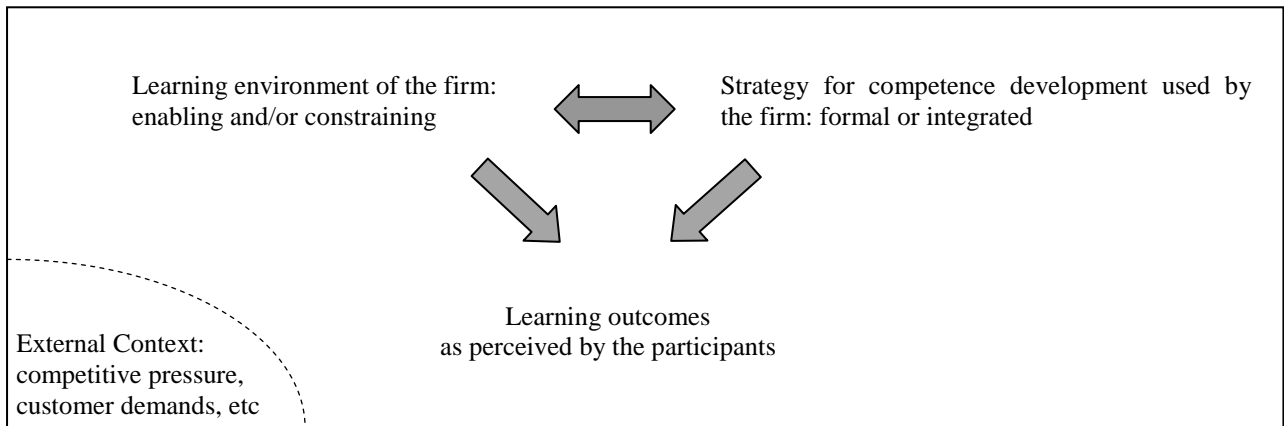


Table 1. Number of Firms and Respondents in Relation to Selection Criteria

Selection Criteria	Number of Respondents	Number of Firms
<i>Firm Size</i>		
10 – 19	36	4
20 – 29	31	4
30 – 39	38	3
40 – 49	25	2
50 – 60	21	1
<i>Ownership</i>		
Public	35	3
Private	116	11
<i>Type of production</i>		
Manufacturing	69	6
Service	82	8
<i>Gender</i>		
Female	93	
Male	58	

Table 2. Differences Between the Two Types of Strategy for Competence Development Used by a Firm in Terms of Learning Environment Aspects.

Aspects of the learning environment	Formal strategy		Integrated strategy		t
	M	SD	M	SD	
Qualification requirements with respect to:					
Ability to work independently (1)	1.78	.79	2.59	.69	6.55**
Quality awareness (2)	2.65	.58	2.83	.40	2.19*
Professional competence (3)	2.69	.57	2.77	.45	.91
Ability to cooperate with others (4)	2.45	.60	2.66	.47	2.34*
Ability to participate in development projects (5)	2.47	.66	2.68	.51	2.10*
Opportunities to learn in daily work (6)	3.13	1.12	3.22	.94	.53
Management support (7)	3.35	1.21	3.78	1.09	2.19*
Use of teamwork (8)	1.98	.84	2.72	2.24	2.34**

*p<.05, **p<.01

Table 3. Main Effects of Type of Learning Environment and Strategy for Competence Development on Learning Outcome Measures (Mean Values).

Learning Outcomes	Learning Environment		Strategies for Competence Dev	
	Constraining M	Enabling M	Formal M	Integrated M
Increased professional competence	2.17	2.66**	2.32	2.57*
Improved ability to carry out new work tasks	1.84	2.58**	2.08	2.29*
Interest in more developmental work tasks	2.12	2.67**	2.35	2.42
Enhanced holistic view of the business	2.17	2.81**	2.10	2.70**
Useable knowledge outside the workplace	1.89	2.33**	2.02	2.15
Increased motivation for learning	2.40	2.75**	2.48	2.65
Increased Self Confidence	2.23	2.57**	2.40	2.40

p<.05, **p<.01, *t*-tests (two-tailed)

Table 4. Results of a Two-Way Analysis of Variance (ANOVA) of the Effects of Competence Development Strategy (CDS) and Learning Environment (LE) on Learning Outcomes.

Sources of variation	Sum of Squares	Df	Mean Squares	F	p
Corrected Model	11.09 ^a	3	3.70	98.9	.000
Intercept	569.15	1	569.15	1523.03	.000
Competence Development Strategy (CDS)	.01	1	.01	.01	.93
Learning Environment (LE)	4.35	1	4.35	11.65	.001
CDS * LE	3.53	1	3.53	9.44	.003
Error	51.57	138	.37		
Total	868.51	142			
Corrected Total	62.66	141			

a. R Squared =.177 (Adjusted R Squared =.159)

Table 5. Analysis of Four Combinations of Learning Environment and Competence

Development Strategy in Relation to Learning Outcomes.

Combinations	Learning Outcomes Mean Values SD		t-tests	
Enabling learning environment/ integrated strategy (E/I)	2.65	.64	E/I – E/F,	t = 2.32*
			E/I – C/I,	t = 5.17**
			E/I – C/F,	t = 2.96**
Enabling learning environment/ formal strategy (E/F)	2.28	.40	E/F – C/I,	t = 2.57*
			E/F – C/F,	t = .23
			C/I – C/F,	t = -2.14*
Constraining learning environment/ integrated strategy (C/I)	1.90	.58		
Constraining learning environment/ formal strategy (C/F)	2.24	.67		

*p<.05, **p<.01