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Antecedents of Organizational Competency Development

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ABSTRACT

One of the most important tasks of managing further education in an organizational setting is to make sure that the employees can apply the competencies developed in the business processes they are involved in. Based on qualitative interviews and a literature research we propose a number of factors which influence knowledge transfer within an organization. The influence factors are translated in an evaluation framework that is further applied in a preliminary study to assess the eligibility of the scales we used. We discuss related work in order to highlight the importance of quantifying the results of interorganizational further education and argue that the strength of our approach lies in the integrative view of competency management which takes a series of stakeholders into account. Although this paper is research in progress, the first results are promising and call for further in-depth research.

Keywords

Competency development, knowledge transfer, learning effectiveness.

INTRODUCTION

In the past the evaluation of learning activities usually focused on assessing the learning outcome and learners' satisfaction. In this day and age, companies are starting to have a deeper look into the effectiveness of the competency development process. Current economic developments are reinforcing the trend for quality management in competency development and managers are challenged more than ever to invest resources only in the most cost-effective learning activities. However, appropriate methods, management tools and IT support for measuring the quality and effectiveness of the training investments are still sparse. Practitioners and researchers have recently started to join forces in order to tackle these challenges and to provide appropriate concepts and tools for an effective and efficient competency development (Gorelic et al., 2004).

Competency development aims at changing attitudes, abilities or behavior; so that employees become more productive in the business processes they are involved in. Participating in formal and informal learning activities is a necessary prerequisite for competency development. These activities can vary from on-the-job training, distance learning, team development as well as courses. Instructors play a crucial role in facilitating competency development. Depending on the type of activity they are involved in, they have different roles such as mentor, teacher, trainer or coach.

In this paper the term competency development goes beyond carrying out competency development activities as mentioned above, but also comprises the whole process of how learning is organized, including any organizational measure that is required to offer and consume learning. This includes the identification of adequate learning needs, the provision of information about learning activities (including information on trainers, locations, material), and the selection of participants. Competency development can therefore be regarded as a sub-discipline of knowledge management concentrating on development of work-relevant knowledge, skills and attitudes via formal, semi-formal and informal learning activities.

In the following sections we first discuss factors that influence the effectiveness of competency development. Subsequently, we present the first results from our empirical investigation and report the reliability and validity of the scales we have used for our preliminary study. We conclude our paper with a short outlook on how we plan to proceed.

EFFECTIVE COMPETENCY DEVELOPMENT

Literature Review

In this paper we propose a methodology for evaluating the effectiveness of personnel development environments. In the study's underlying assumption competency development is considered as inherently integrative activities, requiring several stakeholders to cooperate effectively in order to make an activity a success (Galinanes-Garcia et al., 2005). Derived from this assumption, competency development needs to be viewed and evaluated by taking the contributions and perspectives of all stakeholders into account. The list of stakeholders in the case of a corporate personnel development comprises learners, supervisors, personnel developers, trainers, peers, but also a company's clients.

We treat the issue of effective competency development as a series of decision support problems. All major stakeholders of the process must work together to make the right decisions when it comes to a personnel development activity. All of them - with the sole exception of clients - are covered by the framework we propose. Knowing the importance of various organizational measures for knowledge transfer will help corporations to make better decisions with respect to learning, which will ultimately lead to a more effective personnel development environment.

Recent studies have shown that formal learning, carried out via formats such as courses or training programs, constitutes only a small proportion of all learning processes taking place in corporate environments (O'Driscoll et al., 2005). Livingstone (1990) showed that adults learn about 15 hours a week via informal formats, while they only spend 24 hours a year in formal training. Therefore, our proposed framework may also be applied for informal learning formats such as literature, peer teaching, job rotation/enrichment or workshops.

However, a number of significantly different, but still related work needs to be mentioned. Kirkpatrick (1998) suggests a methodology for an ex-post assessment of training results in four levels: satisfaction (reaction), learning outcome (change of attitudes, skills, knowledge), change in behavior (transfer), and business impact (results). He acknowledges the importance of the learner's manager role when it comes to the transfer of training results and considers the business impact as a rather long-term effect of training – the later point of view is shared with the majority of personnel developers in Austria and Germany (Gunnarsdóttir et al., 2004).

Based on Kirkpatrick's model Phillips and Stone (2002) propose a sophisticated framework for calculating Return-on-Investment figures by measuring and isolating short term results of (formal) learning activities. However, we suggest that the mathematical model they use be improved by taking into account ROI calculations for investments in information technology (Taudes et al., 2000).

Measuring the Quality of Competency Development

The quality of competency development can be measured according to different criteria. The satisfaction of the learner with the learning experience, for example, constitutes an important indicator. However, it cannot be the sole measurement criteria as it does not reveal anything about the changes in the learner's cognition and behavior (Kirkpatrick, 1998). For example, it is possible that the learner's satisfaction with a particular competency development activity or with a particular instructor is very high and thus the learner also rates the overall satisfaction with the competency development process very high.

Therefore it is important to distinguish between the quality of the competency development activity itself and the quality of the competency development processes as a whole. For a learning activity to be successful a change in the learner's knowledge, skills or attitudes can be satisfactory depending on the individual's learning goals. However, for successful competency development, this change is only a prerequisite. Competency development is only considered to be successful and of high quality if the changes in the learner's behavior are transferred into the work environment and ultimately lead to changes in overall organizational effectiveness (Phillips, 2002).

Antecedents of Effectiveness

As pointed out, the effectiveness of competency development can not only be measured by the learners' satisfaction, but needs to involve additional quality criteria, such as the transferability of knowledge to the workplace or the increased competitive capacity of the learner's organizational unit. The final impact depends mainly on cultural, organizational and individual influence factors.

Learner-related Factors	Instructor-related Factors	Organizational Factors	Information Management
Motivation	Intuition	Decision support at learning activity selection	Transparency of the company's/department's
Attitude toward training	Expertise on the subject		

Attitude toward technology Pre-existing knowledge Media preferences Self assessment Career plans and ambitions Loyalty toward organization	Attitude toward training/technology Didactical abilities Experience in teaching	Training schedule Quality of the team Quality of the location IT support Transfer support Incentives for successful learning transfer	goals Transparency of the learner's own development goals Quality of the provided information with regard to the learning activities

Table 1: Influencing Factors on the Effectiveness of Competence Development Process

In scholarly literature (Kontoghiorghes, 2004; Machin et al., 2004; Piccoli et al., 2001) we identified a series of influence factors on the quality of competency development which can be categorized in (1) learner-related influence factors, (2) instructor-related influence factors, (3) organizational factors, and (4) information management, whereof the latter can be seen as a subsection of organizational factors (See Table 1). Subsequently we present our approach and discuss those factors we focus on in our research in more detail.

MEASURING COMPETENCY DEVELOPMENT EFFECTIVENESS

A significant number of research papers dealing with competency development exist, not to mention the plethora of existing literature on knowledgement management. However, since we focus explicitly on the transfer of knowledge as the dependent variable, and since this area of research has not been covered enough in previous literature, we decided to conduct qualitative interviews in order to fine-tune our framework.

Qualitative Study

The research model for the empirical study is based on qualitative interviews and a literature review documented in Gunnarsdottir (2004). Qualitative interviews were performed to assist us in getting a clear picture of the companies' requirements when dealing with competency development. A special focus of this study, which has been neglected in previous studies so far, lies on different aspects of information management and the role of organizational processes.

The qualitative interviews were carried out with nine interviewees from nine different companies. According to the exploratory character of the interviews, the organizations differed in terms of size as well as sector of the industry. The interviews were organized in three sections. In the beginning the interviewers collected general information about the companies, such as annual turnover, number of employees, or annual training budget. This phase of the interviews was meant to set the scene for a more in-depth analysis of the status quo. In the second part positive and negative experiences related to competency development were collected and finally the third part of the interview was used to gather information about internal processes of competency development and the supportive information flow processes. In the course of the interviews all questions relating to the second and third part were further developed based on previous experiences collected. Finally, derived from the results gathered in these interviews, a research model and the corresponding hypotheses were drawn.

Research Model

Based on the qualitative interviews a number of antecedents of knowledge transfer have been identified, which are positively associated with the effectiveness of competency development. In the following section these antecedents will be discussed shortly and, based on logical assumptions, hypotheses will be drawn.

Choosing the right instructor for a specific learning offering is a critical decision. Ideally, the person chosen for the learning activity should be familiar with the target group, their problems and needs and should have expertise in the field (Kirkpatrick, 1998).

- Hypothesis 1: Satisfaction with the trainer will be positively associated with the effectiveness of the competency development.

An individual's motivation plays a crucial role in a learning environment (Mumford, 1997). The important relationship between motivation and learning has long been addressed in classroom teaching (Leutner, 1997). Hence, we assume that a competency development process is at least partly driven by the individual learner and therefore his motivation to participate in learning activities constitutes a driving factor of success.

- Hypothesis 2: The motivation of the learner will be positively associated with the effectiveness of competency development.

In our qualitative requirements study we have learned that sometimes the wrong learning format is chosen, as is the case when a learner has registered for an external course, whereas a colleague could have provided the knowledge in a tutoring session much more effectively. In order to make the right choice from a variety of heterogeneous learning activities, the learner is required to be knowledgeable about the different learning formats.

Self-efficacy, which can be defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391), has been discussed in numerous scholarly papers. In the context of information systems, most authors deal with computer self-efficacy. However, the construct itself is more diverse and can equally be used for a number of different contexts (e.g. social self-efficacy, teacher efficacy, math self-efficacy) (Kuo et al., 2001). In our research we concentrate on a subject's perceived ability to choose the most appropriate learning format, i.e. the subjective judgment how accurate an individual's decisions are in selecting the right learning format. We found the items from Chen et al. (2001), who developed a general self-efficacy scale, to be best suited for our purpose and modified them accordingly.

- Hypothesis 3: The self-efficacy of the learner with respect to the learning format will be positively associated with the effectiveness of competency development.

Schein (1992) described characteristics which can be used to best define an organizational learning culture (OLC). He focused on the important role of maintaining control over the environment, the necessity to have a future orientation and the basic attitude that the world is complex. Although his notion of OLC concentrates on the development of the organization as a whole, rather than on the continuing education of individual employees, it provides a good starting point for estimating the overall importance of organizational values on the appreciation of learning activities. By using a structural equation modeling approach, Egan, Yang & Bartlett (2004) found that a learning culture (represented by indicators such as continuous learning and team learning) tends to have a significant influence on job satisfaction and motivation to transfer learning. Therefore we hypothesize that OLC will have a positive effect on the overall effect of the learning activity. The importance companies assign to workplace-related learning processes is a fundamental part of a company's learning culture and, according to our qualitative study, even within a company differences may exist. Hence we assume that companies which value learning will be more effective regarding to competency development.

- Hypothesis 4: The importance an organization assigns to learning will be positively associated with the effectiveness of competency development.

The alignment of learning activities with corporate goals is seen as being crucial by competency development literature (Kirkpatrick, 1998). However, making an organization's goals transparent is a challenging information management problem (Gunnarsdottir, 2004). We assume that those organizations which manage to make their organizational goals highly transparent will also benefit from a more effective competency development.

- Hypothesis 5: Communication of organizational goals will be positively associated with the effectiveness of competency development.

There is broad agreement in scholarly literature that goal-alignment of competency development constitutes a critical success factor (Seeber, 2000). However, a contradicting understanding of the concrete manifestations of this goal alignment process exists. In most companies learning needs are identified through formal (questionnaires), semi-formal (structured interviews, for example, during appraisal talks) or informal assessment (unstructured face-to-face meetings) that involve group leaders and individuals (Gunnarsdottir, 2004). Additionally, top-down approaches can be distinguished from bottom-up approaches. Top-down approaches derive individual learning needs from a company's strategy, while bottom-up approaches require personnel developers to enter into interactions with a group or group leader in order to identify their development goals. Contributing measures that will lead to an increased goal alignment include e.g. effective communication of a company's strategy, strong leadership, and appraisal tasks which set clear goal definitions. In this study we take a look at the outcome of these processes and investigate the influence of a clear definition of development goals on the effectiveness of competency development.

- Hypothesis 6: Transparency of development goals will be positively associated with the effectiveness of competency development.

Decision theory not only suggests that a maximum amount of information should be available, but also that this information needs to be of high quality (Simon, 1966). Incomplete descriptions of courses and other learning formats and no access to experiences other learners have made with learning activities may confront individuals with a difficult decision making process, during which mistakes can be easily made (Gunnarsdottir, 2004). Hence we assume that individuals, who have access to high quality information pertaining to the potential learning activities, will experience a effective competency development.

- Hypothesis 7: Quality of information provided on learning activities will be positively associated with the effectiveness of competency development.

Frequently learners participate in a learning activity before they are even fully aware of the actual content which the learning activity will cover. Even if the topics are perfectly clear upfront, there may be a gap between the knowledge gained and the actual transfer in the daily work environment. In our qualitative study frequently cases were mentioned, where lack of decision support led learners into situations where they registered for the wrong course or chose the wrong learning format (Gunnarsdottir, 2004). In many cases, however, decision support will be provided by a direct supervisor, who is aware of existing knowledge gaps and is informed about existing learning activities, and/or the personnel developer who knows the learning service providers as well as the typical pitfalls when selecting a learning activity.

- Hypothesis 8: High quality decision support will be positively associated with the effectiveness of competency development.

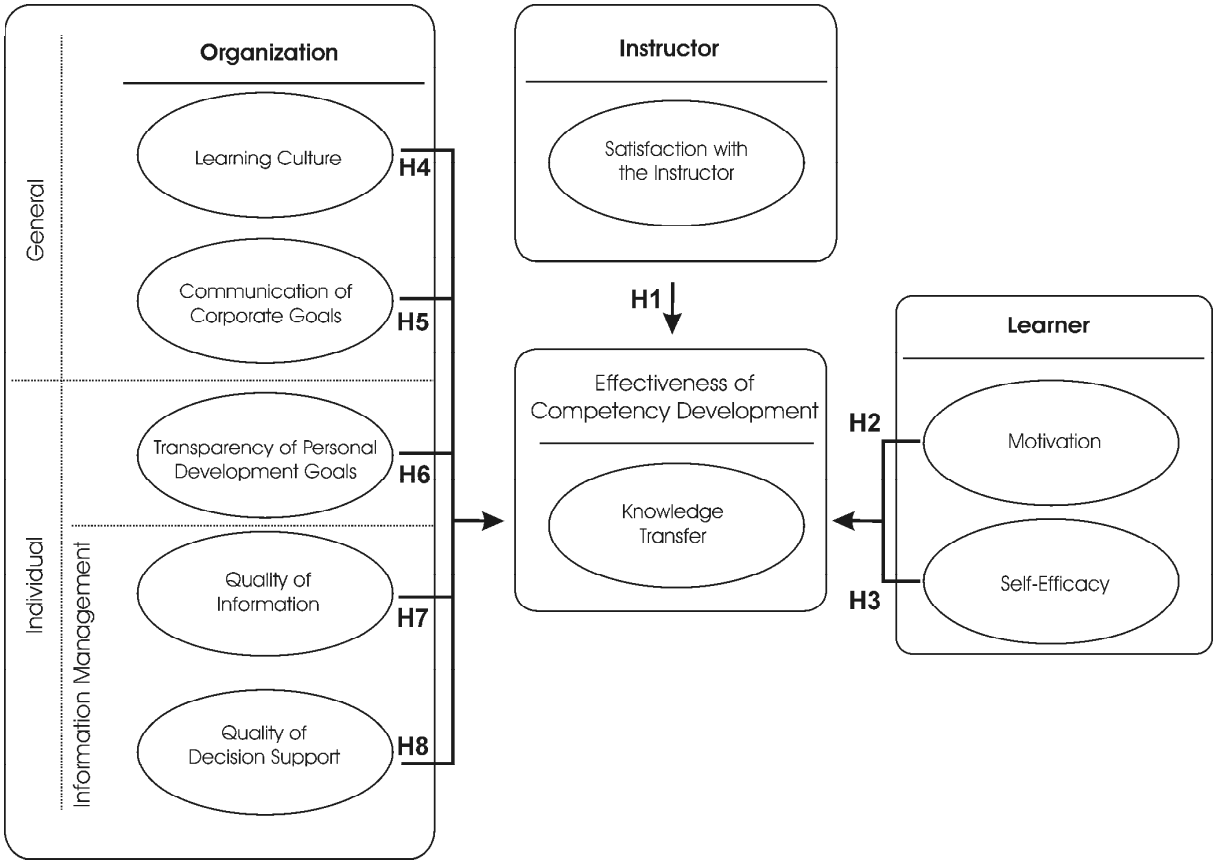

Figure 1. A Model for Measuring the Effectiveness of Competency Development

Figure 1 summarizes our hypotheses and puts them into context. We decided to merge "Organizational Factors" and "Information Management", as being discussed in the previous section, into one comprehensive category "Organization" with a number of subdimensions. In the current state of our research we propose that all of the influencing factors directly impact the effectiveness of competency development. We will use the results of the preliminary study, which are discussed in the following section, to reveal further relationships between the exogenous variables (i.e. the influencing factors).

EMPIRICAL RESULTS

In order to collect the data for our study the participants were asked to fill out an online questionnaire which was made based on the hypotheses discussed above (the items are listed in the appendix). The invitation to fill out the questionnaire was sent to three different companies. In total 270 employees were directly addressed by the survey, of whom 93 responded, resulting in a response rate of 34.44 percent.

In this study we take a look at the outcome of various constructs. We are searching for those influencing factors which yield effective competency development. Effectiveness of competency development is measured by the transferability of learning results (see Figure 1).

In order to test the applicability of the scales we used Principal Axis Factoring with Promax as the method of rotation, since the results are more accurate in representing the population loadings in comparison to the more commonly used Principal Component Analysis (Widaman, 1993). Furthermore, we tried to understand the latent structure of a set of variables instead of simply reducing them without interpreting the resulting variables in terms of constructs (Conway et al., 2003). We chose an oblique rotation method (Promax) instead of an orthogonal rotation, since we expected the constructs to be correlated. This procedure first conducts an orthogonal Varimax rotation and subsequently improves the fit to the data by allowing correlations (Russell, 2002). Fabrigar et al. (1999) p. 287 state that besides getting "cleaner" solutions by using oblique rotation, simply "relying on an orthogonal rotation would also forfeit any knowledge of the existing correlations among factors". The number of factors was determined by using a scree test and compared with those Eigenvalues exceeding 1.0, with both methods suggesting a number of nine factors (Velicer et al., 1990). The factor loadings, which can be found in the appendix, clearly confirmed the hypothesized structure of our constructs.

The Kaiser-Meyer-Olkin measure of sampling adequacy (MSA) indicates to what extent the variables belong together and are therefore appropriate for factor analysis. Our MSA value of .51 is acceptable, but labeled “miserable” by Kaiser et al. (1974). Given the exploratory nature of our preliminary study this value is sufficient for further analyses, but calls for modifications in the final survey.

	Mean	SD	α	1	2	3	4	5	6	7	8
1. Knowledge Transfer	4.03	.69	.73								
2. Transparency of Development Goals	4.33	.60	.71	-.08							
3. Motivation	4.84	.33	.55	-.14	.21*						
4. Self-Efficacy	4.24	.77	.74	.06	.18	.10					
5. Communication of Corporate Goals	3.41	.77	.88	.02	.13	.11	.22*				
6. Quality of Information	3.29	.94	.92	.00	.00	-.16	.29*	.10			
7. Quality of Decision Support	3.71	.72	.83	.21	-.01	-.19	.11	.22*	.25		
8. Learning Culture	4.24	.58	.92	.25*	.11	-.08	.05	.31**	.26	.40**	
9. Satisfaction with the Instructor	4.21	.94	.91	.14	.04	-.09	-.05	.14	.17	.14	.04

Note: Pearson Correlation, * p <.05, ** p <.01, 56 < n < 93

Table 2: Descriptive Statistics, Reliability and Correlations

Table 2 gives an overview of the scales we used, with the original (translated) items being listed in the appendix. Some of these scales have already been developed in previous research and have been taken over and modified accordingly. In other cases, where no such previously tested scales where available, we developed our own items. Cronbach’s Alpha was used to measure the internal consistency as an approximation to reliability. With a value between .55 and .92 all but one construct score higher than the minimum value of .7, as is recommended in scholarly literature (Nunnally, 1978). A five-point Likert scale was used for measurement ranging from “I totally disagree” to “I totally agree”. The total number of data sets for each construct ranges from 86 to 93. Additionally, Table 2 shows which constructs correlate. A highly significant correlation can be found between (a) ‘Learning Culture’ and ‘Communication of Corporate Goals’ and (b) ‘Learning Culture’ and ‘Quality of Decision Support’.

FUTURE WORK

The preliminary study we carried out goes beyond an ex-post evaluation of a particular training event or the aggregation of several ex-post evaluations of training events. It is based on a holistic approach to measure the management of competency development that views learning management as a series of decision support problems. The investigation is not restricted to a particular training event or series of training events, since it also considers other forms of learning (e.g. e-learning, peer teaching, job rotation/enrichment) and investigates the quality of the decisions made with respect to selecting the right competency development activity. Most of the

scales being adopted from existing literature or being developed by the authors show sufficient levels of reliability and validity. In a next step we will refine the questionnaire and conduct further analyses in various organizations. Gathering more data will allow us to test our hypotheses in a more sophisticated setting and by using Structural Equation Modeling we can simultaneously test our hypotheses and allow for correlations between various constructs.

The methodology we develop can also be used as a holistic, summative evaluation approach for personnel development environments. The benchmarking of the various influence factors will help stakeholders to build on the strengths identified and to eliminate weaknesses of further education learning activities. At the time of writing this paper our team is working on setting up a comprehensive database of Educational Metrics (EduMetrics), which will make it easier for companies to identify their strengths and weaknesses by benchmarking their metrics with the ones of the EduMetric Database.

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APPENDIX: Questionnaire Items and Factor Loadings

Scale and Item	Factor 1	2	3	4	5	6	7	8	9
Knowledge Transfer (based on (Bhattacherjee 2001) adapted from (Davis et al. 1989))									
Participating in the learning activities improved my job performance.	.702								
Participating in the learning activities improved my productivity.	.621								
Participating in the learning activities helped me to reach my job-related goals.	.738								
Motivation									
I enjoy learning something new.		.549							
I like to keep up-to-date with job-related developments.		.713							
Self-Efficacy (based on (Chen et al. 2001))									
I have a very precise feeling on when to take a course and when it is better to read a manual.			.717						
I always make a concise decision about the type of learning activity I need (e.g. manual. course. e-learning).			.817						
I easily find the right type of learning format.			.667						
Satisfaction with the Instructor									
The instructors were very competent.				.893					
The instructors were responsive to my questions and problems.				.860					
The instructors were capable of visualizing and communicating the content.				.871					
The instructors used the existing media accordingly.				.706					
I can recommend the instructors.				.864					
Quality of Decision Support									
I get sufficient support when choosing my further education measure.					.793				
My line manager makes suggestions for my learning activities.					.758				
The consulting service I got when choosing my further education measure was satisfying.					.814				
I choose the adequate learning activity together with my line manager.					.719				
I discuss with my line manager which learning activities are helpful for my career.					.624				

Learning Culture (based on (Hult et al. 1997))									
In my company we share a common view that we endanger our future if we quit continuing education and training.						.740			
The sense around here is that employee learning is an investment. not an expense.						.789			
Learning in my strategic business unit is seen as a key commodity necessary to guarantee efficiency of the purchasing process.						.972			
Transparency of Personal Development Goals									
I know my development goals							.652		
I know what topics will be important for me in the future.							.836		
I know what I want to learn in the next six months to advance in my career.							.577		
Quality of Information (based on (McKinney et al. 2002))									
I found the information about the course...									
Very bad ... Very good								.883	
Completely inadequate ... Absolutely sufficient								.924	
Completely incomprehensible ... Very comprehensible								.957	
Communication of Corporate Goals									
I am aware of my company's goals									.938
I know my company's strategic orientation									.808
I can name the main goals of my company.									.884
The corporate goals are sufficiently communicated									.738
Eigenvalue (rotated sum)	4.031	3.666	3.775	3.459	2.909	2.684	1.896	2.158	1.399
Variance Explained	16.864	11.930	10.897	7.808	6.865	5.745	3.480	3.087	2.249

Note: We used a five-point Likert-type scale with possible responses ranging from Strongly Disagree (1) to Strongly Agree (5). Factor loadings lower than .40 have been excluded for better readability.