A Global Reflexion Portfolio-based Competence Development Process
Design for Lifelong Learning in Companies with a High Degree of Diversity

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Abstract: Competence management in multi-national companies is a complex challenge. Business needs generate competence requirements which are imposed on the workforce. A conflict emerges between the imposed requirements with generated standardized learning offerings and a workforce with heterogeneous backgrounds and learning needs. Goal of the paper is the investigation of this conflict from a lifelong learning perspective of individual work process embedded learning. Core contributions of the paper are a study of work processes and a competence management process. For this purpose an extensive observation study was conducted, covering 800 hours of data collected from 50 participants over 100 days. A competence management process is proposed which builds on the creation of reflexion portfolios to analyze the distribution of a competence among different locations and target groups.

1 INTRODUCTION

Especially in the high tech industry, technological changes as well as the growing expectations on product design, stability and innovation make teaching and learning of professionals in companies very important. This development of a "knowledge workforce" (Drucker 1994) needs to be closely aligned with business needs. One strategy of a company to realize this alignment is competence management (Boon and Van der Klink 2001; Garavan and Mcguire 2001; Hoge et al. 2005; Weinert 2001). Required competences for a workforce are identified and monitored. To address a disbalance between requirement and existing competence distribution learning offerings are rolled-out. In knowledge-intensive domains this is a complex challenge which generates a large body of learning offerings which needs to be curated – developed and maintained. This process must consider two conflicting challenges: 1) Top-down demand: Learning requirements are decided from the business need. Frequently, hype-cycles influence the business needs. The top-down approach inherently requires a quick realization of learning offerings; and 2) Bottom-up: Learning offerings are developed for the workforce which itself has heterogeneous backgrounds and thus different requirements towards a learning offering. The heterogeneity of backgrounds and requirements is especially true for companies with a globally distributed workforce.

As a solution, companies frequently decide for a mixture of formal, non-formal and informal learnings, considering a 70-20-10 approach (Lombardo and Eichinger 1996) which focuses on experiential learning (70 percent), learning through others as peer-to-peer learning (20 percent) and learning through formal activities (10 percent). The actual learning content is governed by standardization. One selection of learning offerings is intended to solve the demand of the whole workforce – one size fits all. Still, there is a "tension between global standardization and local practices" (Hustad and Munkvold 2005) – learning offerings do not meet the bottom-up requirements which as an effect is a threat for learning success. In the worst case, the business need cannot be fulfilled by the workforce.

Therefore, the process for creating learning offerings in companies is faced with the following issue: A harmonization of the conflicting challenges of top-down and bottom-up demand is required. In this paper we follow a work-process perspective to address this challenge. By far most learning needs and learning moments materialize in the work process. (Raybould 1995) stated that "many organizations report that 85-90% of person's knowledge is learned

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on the job and only 10-15% is learned in formal learning events".

To address the aforementioned conflict, this paper investigates workplace learning, its requirements and means to integrate the findings into competence management. This approach has two core contributions: 1) Understanding Learning: This work presents an ethnographic study with the goal to gain understanding about the work processes and thus workplace learning of professionals in a global company. The study takes place in a large software company with global business and workforce 2) Supporting Learning: The data gained from the ethnographic study enables to generate insights into the work and learning process. This serves as a foundation to create a mechanism called a global reflexion portfolio-based competence management process which addresses individual, social and organizational learning needs and demands locally and globally – in a spiral process model (Section 7.2).

By generating insights into local practices and the different states of competence development the creation of dedicated learning mixes as well as the identification of best practices for learning offerings can be supported.

This paper is structured as follows: Section 2 presents the current research status on competence development and management processes; Section 3 describes the "bridge" from Competence Development to the Lifelong Learning, Section 4 gives an understanding of Lifelong Learning in the Workplace; Section 5 presents a taxonomy to classify the learning process at the workplace, Section 6 illustrates an ethnographic study to workplace learning in a global company. In section 7 the idea of a global reflexion portfolio-based process for competence development and management is presented and section 8 concludes the paper.

2 RELATED WORK: COMPETENCE DEVELOPMENT AND MANAGEMENT IN SCOMPANIES

Competence development can be defined as an "overall designation for the various measures that can be used to affect the supply of competence on the internal labour market (in individual employees, groups of employees or the whole personnel group)" (Ellström and Kock 2008) or just as a "way in which organizations manage the competencies of the corporation, the groups and the individuals" (Berio and Harzallah 2005).

Other researchers stated, that "research into the effects of education and other forms of competence development in organizations is rather underdeveloped, both theoretically and empirically" (Ellström and Kock 2008). Later both authors stressed the "need for the elaboration of theoretical and empirical basis of the distinction between formal and integrated strategies for competence development, and an empirical research of the effects of the two types of strategy, not only for individual learning outcomes, but also for effects at an organizational level" (Kock et al. 2011).

Competence Management (CM) can be organized according to four kinds of processes (Berio and Harzallah 2005): 1) Competence identification (required); 2) Competence assessment (acquired); 3) Competence acquisition (involved) and 4) Competence usage (produced and transformed).

A case study (nine on-site interviews) to IT supported competence development in the telecommunication company Ericsson (Hustad and Munkvold 2005) showed that the CM process in Ericsson is established as part of the organization's strategic process which is divided into three stages – analysis, planning, implementation. Three main challenges for the implementation of a global competence management system were: 1) Designing a competence framework; 2) Tensions between global standardization and local practices; 3) Gaining commitment from the employees.

3 FROM COMPETENCE DEVELOPMENT TO LIFELONG LEARNING

In knowledge-intensive organizations competence management is used as a technique to align the triad of individual, social and organizational dimensions (Marrelli 1998; Hoge et al. 2005; Garavan and Mcguire 2001) using different perspectives such as resource-based view, distinctive, core competences or organizational capability (Probst et al. 2000). This brings the term competence beyond its traditional specification as work related knowledge, skill, or ability, held by an individual" (Nordhaug 1993). In contrast the resource-based view which "has influenced the field of strategic human resource management" (Wright et al. 2001) considers competence threefold: as human capital (individual dimension), as social capital (groups) and as

organizational capital. In this resource perspective, the individual needs to fulfil a very specific role between organizational and social dimensions. To enable the individual to fulfil the role specific skills, abilities and knowledge is required which can be achieved by learning, based on learning offerings provided by the company.

Thus competence management imposes competence needs for the individual which triggers the creation of learning offerings (top down) on the one hand. This not necessarily can be successfully consumed by the individuals in the company who have various, heterogeneous learning requirements and preconditions (bottom up). One potential reason for this is that competence management as an organizational process tends to focus highly on business needs, without building up a complete understanding of the individual and social conditions. Individuals have another perspective. They execute work and are subject to their own lifelong learning processes which not necessarily go together with the companies learning offerings generated from a competence management process.

In this paper, we try to find a way to address this lack of connection between the individual and learning offering design for competence management. To do this, first the concept of lifelong learning needs to be fully understood to identify means to integrate competence development with learning offering design which embraces the individual in its lifelong learning process.

4 LIFELONG LEARNING IN THE WORKPLACE

The following section investigates lifelong learning and will show that in the work process learning results of the individual manifest and that an investigation of the work process can be the foundation for improved competence management and learning offering design by aligning the earlier mentioned top-down and bottom-up requirements.

A large body of research on lifelong learning in the workplace exists. In many cases, it is broken down into formal, non-formal and informal learning activities (Marsick and Watkins 2001; Eraut 2000; Eraut 2004; Sauter and Sauter 2013). This distinction in many cases helps to realize a focused investigation of learning. However, the resulting separation complicates the investigation of interconnected social and organizational aspects on individual learning. For this, the perspective of Billett (Billett 2002; Billett 2004; Billett 2010a; Billett 2010b) and others (Lave 1991; Engeström and Middleton 1996; Suchman 1996) is more suitable. They enable a perspective on workplace learning which explicitly considers the relations and interdependencies of social norms and practices guiding the individual. Learning becomes a social process which is deeply integrated into the daily activities of the individual. Lifelong Learning by Billett is seen as an “inevitable and ongoing process of development that occurs through individuals’ engagement in conscious and non-conscious thinking and acting throughout their lives” (Billett 2010a). This entails an interdependency between work in learning and learning in work – a complex phenomenon of Lifelong Learning at the Workplace.

As Billett stated, “the most common sites and settings for learning that which occurs throughout everyday thinking and acting largely sit outside courses” (Billett 2010b). This paper aims at highlighting the relevance of work process embedded learning. Goal-directed activities structured by workplace experiences – depending of the regulations of workers participation – thus influencing constitution of their individual and collective experiences during their daily working life are in the focus of this work.

4.1 Structure of Workplace Activities and Participation

Activities and active participation at the workplace are shaped by values and norms that derive from specific worldviews (Billett 2002). Thus, the individual, governed by social factors and norms and being in some respect the creator of his work process must be closely investigated in the context of lifelong learning. Norms, values and regulations are highly relevant elements shaping workplace learning activities of professionals. Those norms, regulations and values are caused not only by the cultural and organizational, but also social and especially individual aspects, which serve as a kind of “structuring structure” for working and learning activities in daily work of professionals. Every single working day has a more or less different structure which as a consequence structures working and learning activities differently – depending on the work focus and job profile.

4.2 Workplace Learning as a Negotiated and Reciprocal Process

Knowledge is "reciprocally" shaped by individuals and their experiences at the workplace (Valsiner and Van der Veer 2000). As Billett and Bound stated, "individuals' learning is not "socialization" (Livingstone 1999) or "enculturation" (Gavelek and Kong 2012). Individual agency shapes engagement in work practice and what is learnt (Billett and Boud 2001). Thus, workplace learning can be seen as "workplace participation and sustaining practice" (Billett 2002).

4.3 Workplace Learning Summary in the Context of This Work

The scope of this work of the conflict of top-down and bottom-up development of learning offerings in global companies – focusing on an IT company. A conflict which requires a better understanding of the relationship. This section has shown how important is it to understand the work processes of professionals as "knowledge workers" (Drucker 1994), to be able to understand how professionals learn in their daily work. Thus, the bottom-up aspect of learning offering design should be founded on findings from the work process. To achieve it, it requires: 1) Work processes of professionals in companies should be investigated to enable to gain important insights about the learning activities of professionals at work; 2) The investigation of the work processes should use methods which enable to identify learning in the context of social norms, values and practices. Thus, ethnographic methods are beneficial for this.

5 WORKPLACE LEARNING PROCESS CLASSIFICATION

An investigation of the work process needs to explore the basic building blocks of the work process. To explore the specific aspects identified in the previous section – capturing the situatedness of learning and the relevant influence of community and culture a rich, yet acknowledged taxonomy is necessary.

This section focuses on existing work on three complimentary perspectives on the work process and respective taxonomies: 1) Activity taxonomy to capture the basic modes of observable interactions of a subject with its environment throughout the workday; 2) Roles taxonomy to focus on how the knowledge worker learns or teaches – using a perspective of "giver" and "taker" learning activities; 3) Communication mode taxonomy to distinguish between different local modes of interaction of a subject with his environment. The choice of taxonomies sketches the work process model of this paper: work processes are considered to be characterized by activities, roles and communication modes. Taxonomies of activities and roles used in this work were selected according to two criteria – communication character and indicators for learning.

Here, the taxonomies are used to investigate: 1) Activities of knowledge workers as a kind of knowledge action they are practicing in their daily work; and 2) Roles as a kind of learner behaviour during their knowledge activities at work.

5.1 Activities: Using and Adapting Existing Taxonomies for Lifelong Learning Investigation

The main goal of the activity taxonomy is to provide a rich vocabulary for individual interaction with the environment. The focus is discriminatory power and completeness with respect to capturing the workday and learning throughout the workday. The activity taxonomy directly builds on earlier work by (Reinhard et al. 2008) which itself integrates the following activities derived by different authors: Information Organization; Conversation; Update; Analyse; Dissemination; Feedback; Authoring, Co-authoring and Expert search.

While the work by (Reinhard et al. 2008) provides a valuable combination of activities, there are limitations when it comes to capturing the workday with a specific focus on learning. To address this the aforementioned activities were merged and extended (in italics) in the following respect: 1) Communication Character: Conversation, Update, Feedback, *Reflexion*, Analyse, Dissemination, Expert search; 2) Indicator for Learning: Expert search, *Information search&reading web, information search&reading print, information search&reading web and print*.

5.2 Roles: using and Adapting Existing Taxonomies for Lifelong Learning Investigation

The foundation for the role activity to investigate the "giver" and "taker" perspective of learning activities was also the work by (Reinhard et al. 2008). The relevant roles are: Sharer, Linker, Networker; Retriever; Controller, Organizer; Solver, Helper.

Additionally, as argued above, existing taxonomies of roles were merged and extended (in italics) in the following respect: 1) Communication Character: Sharer, Linker, Networker, *Explainer*, *Analyser*, *Decisionproofer&decisionmaker*; 2) Indicator for Learning: Solver, Helper Retriever, Networker and *Explainer*.

5.3 Communication Modes

The communication mode complements the perspective of activities and roles. Communication mode stands for the realization of social interaction during the work process. The following types of communication modes within a company can be distinguished: virtually (e.g. skype for business), face to face (in person), face to face&virtually (combination of virtual and personal communication, e.g. conferences, meetings) and office&individually (work alone in the office).

5.4 Conclusion

Activities, roles, and communication modes are relevant because of the following reason:

- Activities help to classify data about what professionals are doing during their daily working days: Types, duration and focus of those activities help to identify the learning moments (explicit) or its indicators (implicit). This information helps to understand how people interact with themselves as individuals and with others as collaborating groups, teams.
- Roles help also to classify, select and understand the ways how professionals act focused on "giver" and/or "taker" perspectives. This helps to understand the transformation between sender and receiver of information and experiences. Those insights show how explicit or implicit the "outcome" of learning (e.g. sharer or retriever) is.
- Communication modes help to find out, what are the more or less preferred communication channels. This information can be very useful by creating global learning offerings which shows common local preferences in communicating with each other.

Taxonomies of activities, roles and communication modes will be used in the following study to investigate how workplace learning of professionals in a global company manifests.

6 AN ETHNOGRAPHIC STUDY IN A COMPANY: HOW DO PROFESSIONALS LEARN?

The following ethnographic study aims to investigate the workplace learning in a global company with the focus on how do professionals really learn in practice.

6.1 Goal: Understanding of the Learning Process

The goal is to understand 1) how learned knowledge manifests in the daily work, 2) how learning takes place in the daily work, and 3) to identify moments of failure due to a lack of knowledge. This investigation will help to understand how competence management can consider actual learning prerequisites and requirement in the design process of learning offerings.

6.2 Method: Participant Observation, Interviews and Questionnaires

To achieve the goal, participant observation was chosen as data collection method rooted in ethnographical research with additionally combined qualitative and quantitative methods. The methodical approach of this study for combining methods was influenced by the insights gained about Lifelong Learning in the Workplace (cf. Section 4). This way of method combination as mixed-methods is also called "systematic triangulation of perspectives" (Flick 1991).

6.2.1 Ethnography

"Ethnography always implies a theory of culture" (Spradley 1980). It results that an ethnographic approach aims at studying other cultures and thus other cultural learning activities. There are three essential aspects related to that: "what people do, what people know, and the things people make and use" (Spradley 1980). Those aspects in the context of learning activities are automatically in continuous relation with cultural behaviour such as reading, cultural knowledge such as norms and rules and also cultural artefacts such as shaping and making the things from natural resources. Later (Atkinson and Hammersley 1994) distinguished ethnography by the main features: "exploring the nature of social phenomena", "tendency to work preliminary with 'unstructured' data", and "analysis of data that

involves explicit interpretation of the meanings and functions".

Therefore, the values of ethnographic (qualitative) methods compared with quantitative methods such as online surveys, have a "greater ability to capture the nature of social phenomena" (Hammersley 2013), e.g., culture, perspectives, practices of the people. In sum, ethnography aims to find a way of "getting inside" of peoples' (individuals and/or groups) view in the Here and Now.

6.2.2 Participant Observation

Participant observation as qualitative data collection method enables the generation of qualitative descriptions and formulation of "concept for measurement, as well generalizations and hypothesis that with further testing may be used to construct explanatory studies" (Jorgensen 1989).

The following arguments of participant observation were relevant for our methodical decision in the study: 1) Insider's Perspective to get a view of "reality"; from the daily working life perspective; 2) Location in the Here and Now of daily work; 3) Interpretations to generate qualitative description and thus provide practical "truths"; 4) Process logic and "logic of discovery" to keep the flexibility, openness, reflexivity during participant observation as open-ended process; 5) An in-depth, qualitative, case study approach and design, to describe and analyse individual cases – here focused on their learning behaviour (Jorgensen 1989); and 6) The researchers role as " professional stranger" (Flick 1991) enables to observe and gain experiences from individuals interactions with other people.

6.2.3 Mixing Qualitative and Quantitative Methods

The combination of qualitative and quantitative methods has different strengths (Steckler et al. 1992): First, generating of rich detailed, valid process data; Second, producing factual, reliable outcome data. To achieve this, we combined the following methods:

- Ethnographic Interviews, to get more information to the specific cases, topics during the observation, esp. in spontaneous situations;
- Qualitative Interviews, for discussion with the observed participant to reflect and evaluate the observed working process and to discuss the "first evaluation insights" of the observation days in a feedback sessions. For each feedback session an individual profile based on the "topics", "roles" and "activities" of the participants during those two observation days were created. Descriptive Statistics was used for the quantitative analysis of the data gained from observation. Classified data was quantified in terms of duration and analysed using aggregation, normalization and basic statistical measures (e.g. average, standard deviation);
- Semi-Structured Interviews, to get an up to date information about the participants (demographic data based). Those interviews included one open question about the learning – Self-evaluation of their own understanding and practicing. The interviews were analyzed using Qualitative Content Analysis as an approach of systematic, rule guided qualitative text analysis (Mayring 2014).

6.3 Study Design

The target group for the observation was composed of professionals with two job types: 1) Professionals who have personal responsibilities (Managers, Senior Managers, and Development Executives); 2) Professionals who have technical responsibilities, without direct people responsibility (Experts, Chief Experts). Both groups originated form "Development" as "Functional Area" of a large global software company. The target group was sampled from the workforce of a large global software company. Participants involved in this study came from six countries: Germany, China, India, USA, Israel and Bulgaria. International Target Group had a number of 50 global participants: 22 experts, 28 managers.

The goal of the study was to explore: 1) Local differences of individual and collective workplace practices between globally distributed professionals as knowledge workers in their activities and roles, also differences related to their job profiles (manager's vs expert); 2) Locally preferred ways to communicate knowledge, common communication channels of professionals in local and global team-working; 3) Implicit (tacit) dimension of knowledge, which is (as mentioned above) highly relevant for different types of workplace learning, especially non- and informal learning activities.

Summarized, those insights should help in understanding connections between Lifelong Learning and Work Processes on the one hand and how possibilities of considering them successfully in a Competence Management Process.

Information was captured as specified in 6.2.3: 1) Observation data was collected, processed, validated and analysed; and 2) Self-evaluation questionnaires were filled out by the participants to get their personal

opinion on learning.

6.3.1 Participant Observation

The following observation process was developed based on several observation trials with workers in a company due to its positive combination of collecting much information and avoiding repetition of observed phenomena: Participant observation of professionals during their daily work. Data was collected by a single observer. The observation had a duration of two workdays per person.

A four Stages Process of observation combined with additional methods was conducted as follows:

(1) Participant Observation: Each participant was shadowed for two days. During the shadowing two tapes of information were collected: time in minutes and a description of what the participant is doing;
(2) Immediate Transcripts: Immediately after each observation session the collected data was cleaned and structured into the following categories: time; process (summarized set of activities); activities; roles; communication mode; topics of the work; and interaction with other persons. Basically, the activity, role and communication mode taxonomy specified in section 5 of this paper was applied to the data. The process reassured the usefulness of the taxonomies for a seamless specification of the work activities observed during the process. The observer did not have access to all meetings of the observed persons due to confidentiality of some meetings – in those cases the time was captured and specified as "observation break" in the data. A peculiarity was that many things the participants did addressed more than one element in the activity and role taxonomy in parallel;
(3) Data Analytics Stage I-Individual level: Generating individual profiles for each participant. Calculation of different indicators based on the observed timespans. The durations of activities, roles and communication modes was calculated per participant. The coocurrence of activites, roles and communication modes was measured. The resulting classification was always verified in a feedback session with the participant;
(4) Data Analytics Stage II-Class level: Data comparison between all six countries mentioned above and the target group based on different job profiles. The tools used for data analysis were R and Excel.

6.3.2 Self-evaluation Questionnaires

The participant observation was complimented by a self-evaluation of the participants with a focus on their own view on learning practices. The self-evaluation had the same participants like the participant observation.

The self-evaluation was structured as follows. Each person filled out a semi-structured questionnaire with a set of questions to capture the personal understanding of learning, beneficial and complicating factors for learning. The questionnaire was filled out one time per person after the whole observation period of two days. The decision to put the questionnaire at the end of the observation phase on the one hand captured an increasing self-awareness of the participants for learning – which was an implicit effect of them being part in an observation study which focused on learning. On the other hand, taking the questionnaire at the end avoided an amplification of this awareness which could result from taking the questionnaire. The questionnaires were evaluated using qualitative content analysis.

Summarized, a study design which combined different data collection and evaluation methods aimed at more in-depth investigation, more valid data evaluation and thus a deeper understanding of the subject.

6.4 Data Set

Two data sets were obtained by the study: 1) Data evaluation of participant observation; 2) Self-evaluation data of semi-questionnaires. Both data sets contain data of the 50 participating professionals with 28 experts and 22 managers; 15 female and 35 male, in total 11 nationalities but located in 6 countries. The data was collected in 6 different countries: Germany, China, India, USA, Israel and Bulgaria. Work experience of the target group: most professionals involved in the data collection phase had a long work experience of 16-20 years (N=15) and 11-15 years (N=14).

Age Spectrum of the target group: most participants were in the age group of 41-50 years (N=23) and 51-older (N=14).

The observation data set covered 100 days and 800h of participant observation. The self-evaluation data set covered the opinions of all 50 participants of the observation study.

6.5 Data Evaluation

The constitutive element of evaluation was twofold: 1) Data Analytics based on the data gained from observation activities, using aggregated durations of

assigned activities, roles and communication modes. This evaluation aimed to identify the learning moments of professionals as "knowledge workers" in terms of activities, processes, roles, and communication modes; and 2) Analysis of the self-evaluation of professionals based on their descriptions aimed to identify the learning moments based on the professionals' own understanding.

Additionally, differences between two types of job profiles were analyzed – managers and experts – but due to the marginal/no significant differences on the level of the used classes, it is not reported here but will be subject for future work.

6.5.1 Evaluation of Observation Data: Identifying Local Learning using Existing Taxonomies

In the following, an investigation of the distributions of activities, roles and communication modes with respect to the target group (experts, managers) and countries is provided. Here we report normalized data. Due to space restrictions other analysis with a focus on deviation and outlier analysis is not reported.

The data presented must be read as follows: the data of the X axis shows the categories in terms of activities, processes, roles and communication modes, which is sorted by highest frequency. The data of the Y axis shows the percentage allocation of those categories in the sum total (Individual data is here already normalized per person and summed per location). Each location has different colour marking.

The following figures 1, 2 and 3 show local differences and similarities between Germany, China, India, USA, Israel and Bulgaria according to activities, roles and communication modes.

1. Activities

The following overview of activities (Figure 1) shows what activities (Section 5) could be identified based on the measured durations. The overview shows, that those activities which are seen as explicit indicators for learning, such as expert search, information search&reading web, information search&reading web and print or information search&reading print (left side of the spider chart) could not often be observed. Activities which have explicit communication character such as conversation&update, conversation&feedback, conversation&reflexion or listening&asking were often observed. There are two outliers – Bulgaria, where "observation break" was extremely often observed and India – where "information search&reading web" was more often observed than in other locations. This implies, that India preferred much more individual based information search modes than the other countries included in the study.

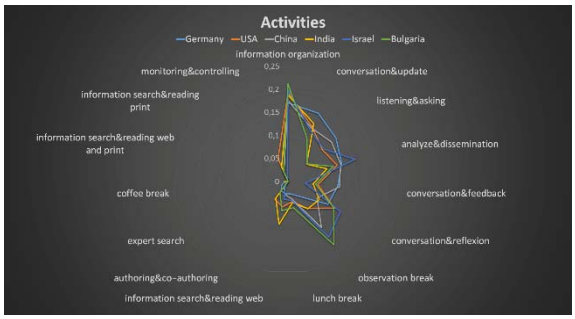

Figure 1: Local Activities of Professionals.

To summarize the overview of activities (Figure 1), it can be said that implicit interpersonal learning identifications dominate (e.g., conversation&update, listening&asking, analyze&dissemination). Thus, not so many explicit information search activities were identified (like expert search, information search&reading web). This reminds of Billett's reflexions about Lifelong Learning in the Workplace (Section 4) and its focus on social practices, e.g. interaction with others.

2. Roles

The following overview of roles (Figure 2) shows, that explicit roles as indicators for learning (e.g., helper&networker, retriever&solver, linker&networker) could not often be observed. Roles influenced by regulations within a workplace such as retriever&controller (especially in India), retriever&analyzer (especially in China), controller&organizer could more often be observed.

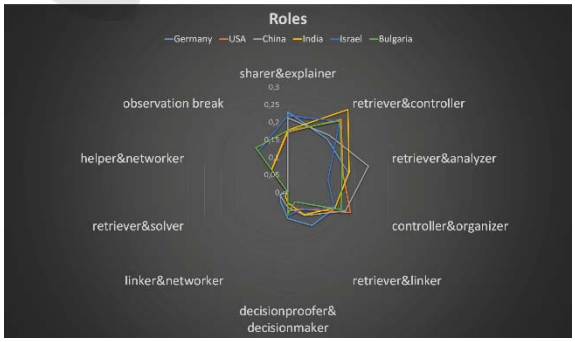

Figure 2: Local Roles of Professionals.

Summarized, the overview (Figure 2) implies, that an implicit dimension of a learner dominates.

3. Communication Modes

An overview of communication modes shows that

"face to face" mode was most commonly used during observation activities in all locations involved. This implies, that communication in person can be considered as being very important. Only in India and Bulgaria "office&individually" mode is preferred.

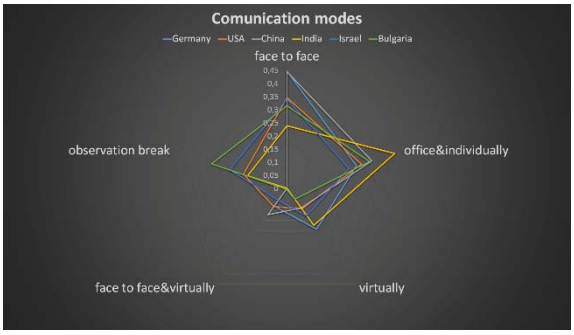

Figure 3: Local Communication Modes of Professionals.

The data gained from the overview about communication modes (Figure 3) can be used for the creation of global learning offerings in companies.

Concludely, we see a large variety of different types of locally preferred learning practices – due to the activities, processes, roles, communication modes.

6.5.2 Self-Evaluation: Identifying Learning through Professionals Own Understanding

The questionnaire the 50 participants filled out included the free-text question "What does learning in the company mean for you?" The answers were coded and mentions were counted. The result is shown in Figure 4 (for the top mention count of the codes mentioned at least by 5 participants).

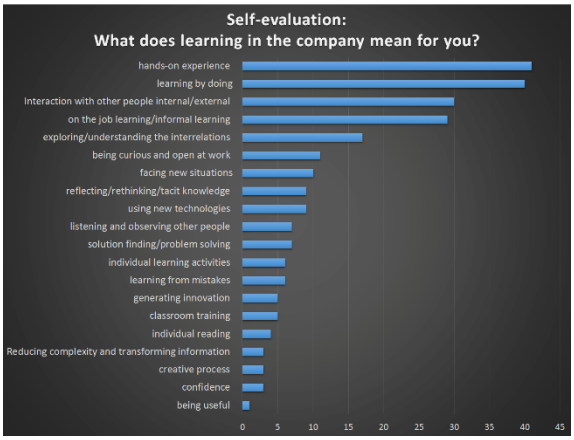

Figure 4: Self-Evaluation of professionals about learning.

Summarized it can be seen a large variety of different kinds of locally preferred learning practices: There is a high preference for workplace learning and interactive formats. Formal learning formats receive less mentions but are still part of preferred learning types. The broad spectrum of different kinds of preferred-learnings underpins the scepticism towards one-size fits all learning format.

6.6 Results

It must be mentioned that the generalization of a study as presented here is not necessarily given. However, many aspects have proven very stable among the 50 participants. Therefore, generalization seems to be possible. The data gained from global participant observation can be concluded as follows:

First, local activities are different between all countries according to the information search (e.g. expert search) as indicator for learning (e.g. India and Bulgaria vs Germany, China and USA and Israel).

Second, local roles don't show explicitly professionals as learners in terms of giver (e.g., solver) or taker (e.g. linker) – thus roles are characterized by tacit nature of learning.

Third, preferred communication mode of professionals locally also shows differences, e.g., "office-individually" is as top 1 in India and Bulgaria, face to face – in other four locations. Therefore, all those local differences shows that "one size fits all format" of learning could difficult help to achieve results that benefit all participants locally. Due to that, a mechanism is needed, which can recognize and address different local learning demands and needs. In the next section will be presented a competence development process.

7 APPROACH

This section presents a competence management process which is structured based on a reflexion-portfolio. The idea is to avoid an immediate reuse of the findings from the study. The portfolio much more aims at providing a method to make informed decisions which consider top-down and bottom-up requirements as well by collecting relevant data.

The reflexion portfolio allows for the identification of local practices and provides an overview of the existing competence levels in a target group. The specific benefit of this process is the creation of learning offerings as dedicated learning mixes (formal, non-formal, informal) which address local practices. Thus, they can help realize

competence management and address the identified tension in competence management.

7.1 Participant Observation as Basis for Building a Reflexion Portfolio

Goal is to create a process for the design of learning offerings which is capable of integrating the differences in a globally distributed and diverse target group. Inspired by the beneficial insights gained during the observation study, the decision taken is to strongly stimulate a comparable process of reflecting empirical data which represents local learning behaviours and local competence profiles. At the same time, it is absolutely necessary to limit the effort required for collecting the data and to reason about the data. The chosen approach is the use of reflexion portfolios which helps in making the intangible workplace learning processes tangible (Section 4). To make this more explicit a short background on portfolios shall be given first. Then, our learning design process is described.

A portfolio can be described as "a purposeful compilation and reflection of one's work, efforts and progress" (Milman 2005). According to Baumgartner`s taxonomy of e-portfolios (digital form of a portfolio), a reflexion portfolio involves two sub-types of portfolio: 1) Learning portfolio, to show the learning products and processes. This type on the individual level includes the learning products (summative: objectives) and learning processes (formative: activities – individual and/or collaborative) of professionals; 2) Evaluation portfolio, to evaluate the skills and competences by e.g. curriculum in form of exams of professionals. (Baumgartner and Himpsl 2006).

In this work a reflexion portfolio can be understood as a living document which focuses a competence of interest and structures information about the competence from one or more locations, communities, individuals. This kind of document aims to show and especially to reflect the competence development across different locations and target groups.

7.2 Reflexion Portfolio for Assessment of Competences in Companies

Basically, the reflexion portfolio is a living document which collects competence related information for a specific competence in a target group with respect to a chosen competence goal (Figure 5). It is maintained by a competence manager – probably human resources staff. First, a target section of the portfolio specifies the competence, target group and competence goal. The remaining portfolio is governed by an iterative process of competence management which is supported by the portfolio. This process is composed of three steps: as-is analysis, gap-analysis and measures. Each iteration forms one chapter of the reflexion portfolio, including the following information: 1) The "as-is" section offers information about the state of competence within the target group at a given point in time. This section allows to gain detailed information about the target group where a competence of interest is located (locations, local learning groups/communities, individuals); preferred methods in working and learning with this competence of interest; local and cultural aspects as factors influencing the handling of this competence; 2) "Gap-analysis" aims at exploring the status of a competence of interest within the target group. This in-depth analysis allows to explore a "lack" of this competence on the macro (locations), meso (learning communities) and micro (individuals) levels of an ecosystem. The findings gained in this section enable to derive suitable measures; 3) "Measures" to address the identified gaps in the phase before can be formal (e.g., formal training programs), non-formal (e.g., learning communities, virtual forums) and/or informal (e.g., learning spaces).

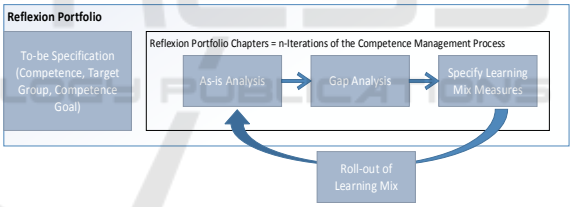

Figure 5: Process of a Reflexion Portfolio.

Typically one iteration can have a duration between a couple of months and one year. It depends, what kind of competence is needed, who target group is and how long it takes to gain and evaluate the data and derive suitable measures.

7.3 Towards a Tool Perspective on Competence Development

The described competence development process builds on the collection of data about local competence profiles and learning preferences. As earlier mentioned, it is of utmost important to simplify the data collection and analysis process. For this purpose, we currently design a tool which supports the whole process described in Section 7.2. The data collection is core of the tool. By connecting

to the active directory of a company and existing skill databases the target group identification is simplified. Furthermore, the tool supports the adaptation of the prepared competence questionnaires, the roll-out, follow-up and transformation of the questionnaire answers into reflexion portfolio sections. The tool support is semi-automatic – requiring an investigation of data in each step – to assure high quality and foster the reflexion of the subject matter by the competence manager throughout the whole process.

8 CONCLUSIONS

This paper has investigated a common challenge of competence management in companies. Business needs generate competence requirements which are imposed on the workforce. A conflict emerges between the imposed requirements with generated standardized learning offerings and a workforce with heterogeneous backgrounds and learning needs.

Goal of the paper is investigation of this conflict from a lifelong learning perspective of individual work process embedded learning. Core contributions of the paper are a study of work processes and a competence management process.

The study investigated individual learning processes to understand how learning takes place, the learning needs, how they emerge and how they are fulfilled (bottom-up perspective). For this purpose participant observation of 50 knowledge workers (managers, experts), 2 days each, resulting in 800 hours of collected data was conducted and analysed. Important findings were: 1) Work process embedded learning: Most learning happens as part of the work activities and was unpredictable beforehand 2) Learning in interaction: Frequently, individuals learn by sharing experience and information with others 3) Less relevance of job profiles: A large amount of learning needs is independent from the specific job profile.

Competence Management Process: The process is a framework to align competence requirements with an understanding of learning needs and conditions of the workforce. The process re-uses the work process knowledge collected during the study and helps in realizing a competence management process which integrates business needs and individual needs. The process explicitly avoids a dogmatic perspective on company learning needs on business or individual side. In contrast the goal is to have a process which builds on learning need related data which is collected and regularly updated. Thus, we assume that aspects we identified in the study (learning in the work process/learning in interaction and the relevance of roles) will automatically be identified and addressed for those competences and workforces which actually require it.

Future work will apply the reflexion portfolio and assess it especially with respect to its effect on the conflict between business and individual needs.

REFERENCES

Atkinson, P. & Hammersley, M., 1994. Ethnography and Participant Observation. , pp.248–260.

Baumgartner, P. & Himpsl, V.K., 2006. Eine Taxonomie für E-Portfolios.

Berio, G. & Harzallah, M., 2005. Knowledge Management for Competence Management. , 0(1), pp.21–28.

Billett, S., 2002. Critiqing workplace learning discourses: Participation and continuity at work. *Studies in the Education of Adults*, 34(1), pp.56–68.

Billett, S., 2010a. Lifelong learning and self: Work, subjectivity and learning. *Studies in Continuing Education*, 32(1), pp.1–16.

Billett, S., 2010b. The perils of confusing lifelong learning with lifelong education. *International Journal of Lifelong Education*, 29(4), pp.401–413.

Billett, S., 2004. Workplace participatory practices: Conceptualising workplaces as learning environments. *Journal of Workplace Learning 16 (6)*, 1, pp.312–324.

Billett, S. & Boud, D., 2001. Participation in and guided engagement at work: Workplace pedagogic practices. In *Researching Work and Learning, Second international conference on learning and work*. pp. 18–30.

Boon, J. & Van der Klink, M., 2001. Scanning the concept of competencies: how major vagueness can be highly functional. *Perspectives on learning in the workplace. Proceedings Second Conference on HRD Research and Practice Across Europe*, pp.299–307.

Drucker, P.F., 1994. The Age of Social Transformation. *Atlantic Monthly*, 274(5), pp.53–80.

Ellström, P. & Kock, H., 2008. Competence Development in the Workplace: Concepts , Strategies and Effects. , 9(1), pp.5–20.

Engeström, Y. & Middleton, D., 1996. Introduction: Studying work as mindful practice. *Cognition and communication at work*, pp.1–15.

Eraut, M., 2004. Informal Learning in the Workplace. *Studies in Continuing Education*, 26(2), pp.247–273.

Eraut, M., 2000. Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, 70, pp.113–136.

Flick, U., 1991. *Stationen des qualitativen Forschungsprozesses*, Beltz-Psychologie Verl. Union.

Garavan, T. N. & Mcguire, D., 2001. Competencies & Workplace Learning: the Rhetoric & the Reality. *Journal of Workplace Learning*, 13(4), pp.144 – 164.

Gavelek, J. R. & Kong, A., 2012. Learning: A Process of Enculturation. In *Encyclopedia of the Sciences of Learning*. pp. 2029–2032.

Hammersley, M., 2013. *What's wrong with ethnography?*,

Hoge, M.A., Tondora, J. & Marrelli, A.F., 2005. The fundamentals of workforce competency: Implications for behavioral health. *Administration and Policy in Mental Health and Mental Health Services Research*, 32(03), pp.509–531.

Hustad, E. & Munkvold, B.E., 2005. IT-supported competence management: A case study at Ericsson. *Information Systems Management*, 22(2), pp.78–88.

Jorgensen, D. L., 1989. *Participant observation*,

Kock, H., Ellström, P. & Kock, H., 2011. Formal and integrated strategies for competence development in SMEs. *Journal of European Industrial Training*, 35, pp.71–88.

Lave, J., 1991. Situating learning in communities of practice. *Perspectives on socially shared cognition*, 2, pp.63–82.

Livingstone, D., 1999. Exploring the icebergs of adult learning: Findings of the first Canadian survey of informal learning practices. *The Canadian Journal for the Study of Adult Education*, 13(2), pp.49–72.

Lombardo, M. M. & Eichinger, R.W., 1996. The career architect development planner. *Lominger p. iv, 1st ed. Minneapolis*.

Marrelli, A. F., 1998. An introduction to competency analysis and modeling. *Performance Improvement*, 37, pp.8–17.

Marsick, V. J. & Watkins, K. E., 2001. Informal and Incidental Learning. *New Directions for Adult and Continuing Education*, 2001(89), p.25.

Mayring, P., 2014. Qualitative content analysis: theoretical foundation, basic procedures and software solution.

Milman, N.B., 2005. Web-based digital teaching portfolios: Fostering reflection and technology competence in preservice teacher education students. *Journal of Technology and Teacher Education*, 13(3).

Nordhaug, O., 1993. *Human capital in organizations: Competence, training, and learning*, Universitetsforlaget.

Probst, G. J. et al., 2000. Kompetenz-Management. *Wie Individuen und Organisationen Kompetenz entwickeln. Wiesbaden: Gabler*.

Raybould, B., 1995. Performance support engineering: An emerging development methodology for enabling organizational learning. *Performance Improvement Quarterly*, 8(1), pp.7–22.

Reinhard, W., Schmidt, B. & Eppler, M.J., 2008. Knowledge Worker Roles and Actions— Results of Two Empirical Studies. *Knowledge and Process Management*, 15(1), pp.59–71.

Sauter, W. & Sauter, S., 2013. *Workplace Learning: Integrierte Kompetenzentwicklung mit kooperativen und kollaborativen Lernsystemen*, Springer-Verlag.

Spradley, J. P., 1980. *Participant observation*, Wadsworth, Belmont, USA.

Steckler, A. et al., 1992. Toward Integrating Qualitative and Quantitative Methods: An Introduction. *Health Education Qurterly*, 19(1), pp.1–8.

Suchman, L., 1996. Constituting shared workspaces. *Cognition and communication at work*, pp.35–60.

Valsiner, J. & Van der Veer, R., 2000. *The social mind: Construction of the idea*, Cambridge University Press.

Weinert, F. E., 2001. Concept of competence: A conceptual clarification, Hogrefe & Huber Publishers.

Wright, P. M., Dunford, B. B. & Snell, S. A., 2001. Human resources and the resource based view of the firm. *Journal of Management*, 27(6), pp.701–721.