



Enterprises can leverage work arrangements for more effective Lifelong Learning

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Ulrik Brandi
Aarhus University
Denmark

Rosa Lisa Iannone
Aarhus University
Denmark



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Zeppelin University
Am Seemoserhorn 20
88045 Friedrichshafen
Germany

Authors:
Prof Dr Ulrik Brandi
Rosa Lisa Iannone

Graphics, Design and Layout:
Maren Sykora

Multimedia and Website:
Urs Boesswetter, Spooo Design

Video Production:
Sascha Kuriyama

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About the authors

Ulrik Brandi

Prof Dr Ulrik Brandi is Associate Professor in Organisational Learning at Aarhus University's Department of Education and Head of the Lifelong Learning research programme. He holds an M.A. in Educational Studies and Philosophy and a PhD in Organisational Learning from Learning Lab Denmark. Ulrik's research interests include workplace and organisational learning and change, knowledge sharing, and innovation. He examines how organisations and their members learn new practices and share knowledge, and studies the factors that facilitate or impede these learning processes.

Rosa Lisa Iannone

Rosa Lisa Iannone is an independent professional in the field of education who has worked in a variety of roles in European collaborative projects and individual higher education institutions. She is also a Research Assistant at Aarhus University's Department of Education, Associate at University College London, Institute of Education, and a member of the Comparative Education Society in Europe. She holds a multidisciplinary bachelor in Global Governance from York University, Collège Glendon and an Erasmus Mundus Masters in Lifelong Learning: Policy and Management from Aarhus University, the University of Deusto and the Institute of Education, University of London.

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Introduction

Key question:
What are the pivotal aspects of enterprise environments and how work is organised that sustains lifelong learning?

Human resources strategies at the enterprise level, lifelong learning at work, is in key focus for the LLLight'in'Europe FP7 project. This also directly addresses the EU's strengthening of its position as "the most competitive and dynamic knowledge-based economy in the world" (European Parliament, 2000, l.5.) and the Europe 2020 targets (EC, 2011).

Following an abductive, empirical methodology, LLLight'in'Europe has examined lifelong learning ecosystems (work design and the organisation of work) in enterprises, from past empirical and theoretical work (69 articles, 1990-2012, see Brandi et al., 2013) in combination with our own empirical research, conducted in 194 enterprises (31 EU, 163 EU-competitors), across 53 industries.

Our data reinforces the premise that work design and the organisation of work are important aspects to be considered in high-performance work systems (HPWS) and enterprise growth. To begin, having a human resources (HR) department, or designated HR-person, helps systematise HR practices (HRPs). At the very minimum, transactional and traditional HRPs that are more administrative in nature are more easily handled when centralised and consequentially, larger enterprises make use of this to manage HR processes. Paralleling this trend however are an increase in hierarchy and distinction in status between employees (and ranks), which do not foster responsiveness to on-demand, work-related needs. Furthermore, despite the fact that most of today's routine work is being undertaken by large enterprises, a slight majority of our participants report their work as being 'very' or 'extremely' challenging and that they assume decision-making power over their work design. Also, a good proportion of work is being organised through teams. Team-based work arrangements increase as enterprise size decreases to about 10 employees; less than 10 employees typically means individuals are working alongside one another, independently.

As part of enterprises' environment, we examined conflicts and challenges at the workplace. Stress and burn-outs were reported as the most important and onerous workplace problems, followed by communication breakdowns, conflicts with clients, frustrations with workloads and conflicts between management and staff. Affecting this aspect are contextual forces that require further examination. Nevertheless, and as exemplified in some of the narratives from our qualitative data, there are HRPs that address problem-detection and problem-resolution (e.g. Argyris & Schön, 1996) so that enterprises and staff may overcome these.

As a result, the project's findings reveal that some work environments have lifelong learning embedded in both the type of work undertaken and environments that lend themselves to team processes. For highly regulated work environments, lifelong learning challenges must be met through more planned and projected offerings.

Implications lead us to perceive that there is ample opportunity to enhance workplace environments so as to bolster enterprise and employee wellbeing, growth and success. Based on our findings, we have made several recommendations, since an environment that can promote and bolster lifelong learning can be harnessed. In striving towards enhancing enterprises as institutions of lifelong learning, we must also continue to support collaboration between policymakers, practitioners and researchers.

Key Observations

In examining lifelong learning environments and work organisation in 194 enterprises (31 EU, 163 EU-competitors), across 53 industries, LLLight'in'Europe bolsters the premise that rich and complex work as well as employee- and team-driven learning initiatives reinforces continuous and sustained learning experiences at work.

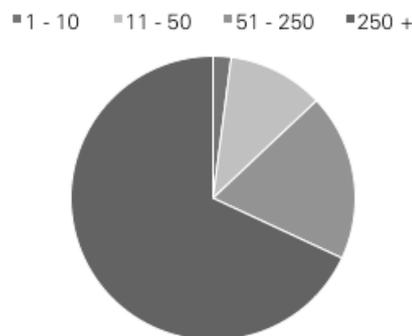
Work design or work organisation encompasses the setups, channels and strategies adopted towards supporting production, communication, and general enterprise performance, internally. By examining these aspects, we can identify the coordinated efforts of work that lay the foundation to providing employees coherent competence development opportunities and continuous learning in and around the workplace.

Having an HR department, hierarchy, status distinction and bureaucracy

To begin, we examined the setup of HR systems – are there HR leaders in the enterprise?; are there HR teams or HR departments?; is there a clear person or area one can go to for HR-related needs? Not surprisingly, enterprise size determines the existence of HR-coordinated functions, much like in our earlier findings, in relation to the systematisation of learning:

Figure 1: How enterprise size matters in terms of having an HR department

Not surprisingly, HR leadership is largely present in large enterprises; however this also tends to lead to top-down work organisation, which may impinge on enterprise flexibility, employee autonomy and agency, as well as adaptability and response success to change



The figure above reinforces the recognition that the larger the enterprise, the more systematic the organisation of learning, and the more formalised HRPs are. Linked to hierarchy and bureaucracy trends (below), the administrative distinction of an HR-area also tends to lead to a rather top-down organisation of work, rather than a bottom-up approach.

For example, Figure 2 illustrates that in large part, hierarchy is still very present and felt in large enterprises, echoed in Figure 3, which depicts the extent to which status distinction permeates workplaces. Paralleling these trends are layers of bureaucracy, which also play a role in impinging on enterprise flexibility, employee autonomy and agency, as well as change and adaptation processes.

Figure 2: Extent to which employees perceive the enterprise as hierarchical, per enterprise

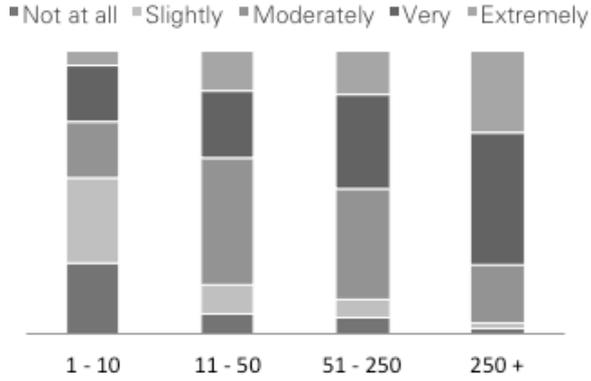


Figure 3: Extent to which employees perceive distinction in status & ranks, per enterprise size

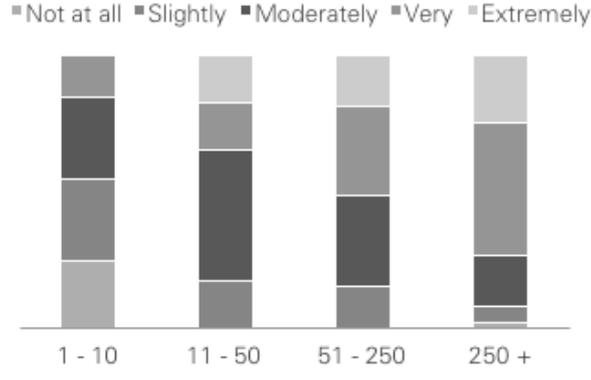
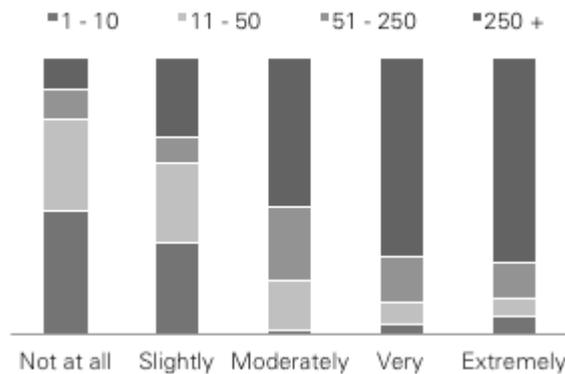


Figure 4: Extent to which employees perceive the enterprise as bureaucratic, per enterprise size



Hierarchy, bureaucracy and status distinction pose challenges to lifelong learning; they can encroach on feelings of belonging and may stall performance

As expressed by several of our empirical research participants, and the literature on HRPs, these three aspects pose challenges to ongoing training and development, particularly with respect to informal and non-formal workplace learning – which from our analysis of successful types of learning (see Brandi & Iannone, 2015), represent the greatest variety and source for on-demand, responsive learning to work-related needs. For more traditional and transaction HRP-deployment, such as the administrative management of personnel (e.g. leave, benefits, contracts, etc.), coordinated and transparent HR operations function as facilitators. However, as we have seen from our empirical participant narratives, hierarchy, bureaucracy and status distinction may encroach on feelings of belonging, a sense of “family” (Senior Manager Research and Development, Enterprise DE250J62SSI10) and may also stall performance: “I think, our general management isn’t often in the house, and so you have to wait until they are there to talk about problems you’ve had for three weeks...” (Loyal Employee of more than a decade of service, Enterprise Anonymous I: 8). As we will discuss a little later, empowering employees to actualise their own potential can be enabled by work arrangements where employees have influence and decision-making power over their own work and teams.

Routine work

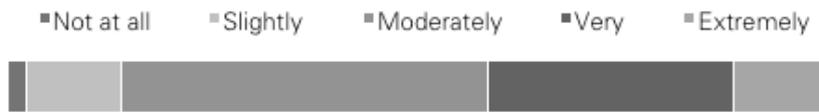
Disjuncture prefaces learning and growth; therefore, special assignments and job-rotation are incentivising strategies for lifelong learning

Punctuating routine work with something different and/or challenging is motivating and sharpens higher-order skills

Work arrangements – formal or informal – are largely dependent on the type of work performed. Certain industries are characterised by a high degree of routine work such as in manufacturing, financial provisions (e.g. auditing and insurance provisions) and human care services (e.g. dentistry, physiotherapy, specialised surgery work, etc.), while knowledge work and other creative industries require outputs that are less replicable and more differentiated, unique – created through a greater level of divergent thinking and enacting. What we know from the literature however, is that the identification of opportunities for growth (personal and work processes) are prefaced with disjuncture; when we are not in harmony with the state of affairs (Jarvis, 2012), which is why special assignments and job-rotation are considered as incentivising HRP for example. This is not to say that we must go looking for problems in routine work, since routine work has its strengths and must be leveraged/exploited (Kang, Morris & Snell, 2007; March, 1991), in a quest for evermore effective and efficient modes of delivery. Yet routine work inevitably draws on our lower-order thinking skills (Bloom & Krathwohl, 1956) and if forsaken, higher-order thinking skills (ibid.) begin to dull and an individual's intrinsic motivational need to self-actualise (Herzberg, 2003; Maslow, 1943) through work abates, leading to performance repercussions, as noted in our research findings and past empirical work (Brandt et al., 2013).

Our respondents tell the story that routine work is very much a reality of work arrangements, with close to half reporting their work is 'very' or 'extremely' routine:

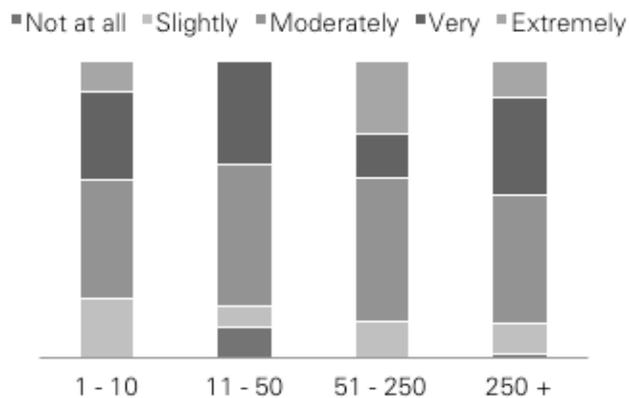
Figure 5: Extent to which employees perceive their work as routine work



We analysed responses according to enterprise size and found that employees working in larger enterprises report having more routine work than those in SMEs, though the difference is slight. What this indicates is that employees are in positions where most of their work is known to them, with only a fraction who report their work as being 'not at all' or 'slightly' routine. The implications lead to further questions as to whether this contributes to enterprise growth, job satisfaction or other facets of HPWS, yet we note that the larger the enterprise, the more work becomes routinized:

Figure 6: Extent to which employees perceive their work as routine work, per enterprise size

Routine work is more prevalent in larger enterprises



Work can be challenging on many levels. Our respondents mostly report their work as being 'moderately' and 'very' challenging, irrespective of enterprise size

Alongside routine work is the level of challenge work presents to employees; including cognitive, physical, psychological and other challenges. In our analysis, we found that the pattern of challenging work was shared by all employees, irrespective of enterprise size:

Figure 7: Extent to which employees perceive their work as challenging work, per enterprise size



What Figure 7 illustrates is that a slight majority of our participants find their work ‘very’ or ‘extremely’ challenging with a small proportion reporting only ‘slight’ or ‘no’ challenge at all. An example of challenging work arrangements is presented from a South African SME, operating in the NACE M73.1 – Advertising industry:

Challenging work promotes learning; yet enterprise work arrangements must make time and space provisions for learning

Staff development happens informally. We haven’t synced any of our staff on courses or anything like that. But, I think they all have quite a lot [to learn] on the job so, ‘the works’. The work that we get changes all the time. Each new project has new challenges, which requires new learning. And whenever there’s a project that requires new learning, we take into account how we allocate time for that project so that they [employees] can learn, whatever they need to learn. There’s definitely quite a strong culture of self-learning, because we de-brand development. It’s quite a broad spectrum of services, and we are always trying to stay on top of new technologies. When there’s a new technology or a new service, then we often allocate that to somebody. It’s very much learning on the job, giving space and time to do that (Creative & Managing Director, Enterprise ZA1M73SSI12: 2-3).

Challenging work addresses intrinsic reward needs and is characteristic of teamwork

This narrative demonstrates how challenging work is highly linked to decision-making power on the individual level in enterprises, attending to the intrinsic rewards of work. We have also seen in other narratives from our research that challenging work is also something characterising teamwork, with teams that are grouped according to business areas, but also temporary teams who come together to discuss potential solutions to newly discovered mistakes, exceptions, and atypical situations.

Team-based work

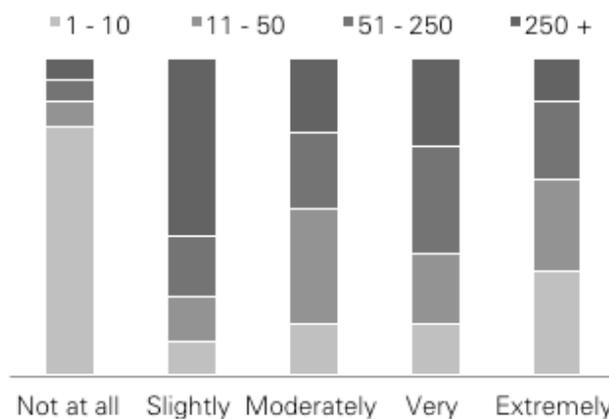
Team-based work is constitutional to high-performance work systems and responds to intrinsic, cognitive and affective needs

Team-based work is a necessary consequence of evermore-complex work and HPWS, as we have also seen from past empirical research (Brandi et al., 2013). Our participants report that a good proportion of work is organised through teams, though as our findings suggest, the larger the enterprise, the less team-based work is a particular:

Figure 8: Extent to which employees experience team-based work



Figure 9: Extent to which employees experience team-based work, per enterprise size



Very small (1-10 employees) and larger (250+ employees) enterprises have the least team-based work organisation

In Figure 9 above, very small enterprises (1-10 employees) and large enterprises (250+ employees) report the least team-based organisation of work. For the former, this may be due to low employee count, and for the latter, this may be due to the deconstruction and segregation of work processes into smaller, lesser-skilled work tasks. This inference is also based on linking these results with the patterns we found regarding enterprise size, bureaucracy and hierarchy.

Given the motivating factors of work, team-based work responds to intrinsic, cognitive, and affective needs and is therefore an important feature in HPWS. It is one of the most successful work arrangements in fostering, ongoing, socio-cultural and action learning through interactions.

Decision-making power is also characteristic to high-performance work systems

Employee influence on work

Decision-making and influence on work that is bottom-up is also characteristic of HPWS. Empirical studies (Brandi et al., 2013) underscore, in relation to high-functioning work design, that employees should be given a high degree of independence, decision-making and influence on how work processes are organised. Generally, our analysis shows that employees in smaller enterprises are more likely to experience that they have influence, as compared to employees in larger enterprises.

Data from the ECS in Table 1, demonstrates that enterprises with 10-19 employees (60,5%) and 20-49 employees (57,4%) report that they have either 'very strong' or 'quite strong' influence on changes in the organisation of work, while around 50% of employees report the same in enterprises with 250+ employees.

Table 1. How large is the influence of employees on management decisions in the enterprise for changes in the organisation of work processes and workflow? - Question ER207_6, 2009 ECS

		Influence on changes in the organisation of work processes and workflow					Total
		Very strong	Quite strong	Quite weak	Very weak	DK/NA	
Size	10 to 19	15,0%	45,4%	22,3 %	12,4%	4,9%	100,0%
	20 to 49	13,0%	44,4%	26,5 %	12,1%	4,0%	100,0%
	50 to 249	8,2%	39,6%	33,6 %	14,2%	4,5%	100,0%
	250 to 499	7,5%	35,3%	38,5 %	15,6%	3,1%	100,0%
	500 +	8,5%	37,4%	39,8 %	12,2%	2,1%	100,0%
Total		9,8%	40,2%	32,6 %	13,5%	3,9%	100,0%

* size of enterprise in five categories

Employees in SMEs typically enjoy greater influence over the organisation of their work than employees in large enterprises

Thus, an interpretation from our analysis – even though the correlation is rather weak (.064 significance at the 0.01 level, 2-tailed) – is that there is an inclination to have a type of top-down decision-making practice in larger enterprises while smaller enterprises are characterised by a larger degree of autonomy when it comes to influence on changes in general. Looking at industry types, employees in transportation and storage services industries report the greatest sense of influence on changes in the organisation of work processes and workflow, with 59,2% responding ‘very strong’ or ‘quite strong’. The construction and administration and support services industries report slightly weaker levels of influence, with 54,1% of employees reporting ‘very strong’ or ‘quite strong’. In contrast, the ICT services sector reports 41% of employees experiencing their impact on decision-making regarding the organisation of work processes and workflow. Given the distribution of data, it is our perception that there exist specific historical, cultural and sociological conditions that are difficult to seize with the quantitative data presented in the ECS on this specific aspect.

For example, some sectors are characterised by larger enterprises and others by SMEs and some industry types have a history of top-down and bureaucratic organisational structures, while others are characterised by flatter structures. In enterprises whose operations rely mostly upon labour-intensive work that is routine, we have an example that tells how to leverage employee agency, despite the organisation of work that decreases independence and decision-making power. A Slovakian enterprise of around 120 employees, operating in the NACE C23.4 – Manufacture of porcelain and ceramic products explains:

Top-down and bottom-up decision-making power might be legacies from historical and sociological conditions; further research is needed to identify reasons for, benefits and barriers

There are different approaches for different production parts; very particular and sensitive areas are sales- and technology-lines. For sales we have an individual approach. We are operating in emerging markets and every person in sales faces different challenges related to their geographical area and the nature of their partners. For operators of the technology parts, I personally seek to make them understand the underlying processes, and to act proactively, to anticipate problems and avoid larger damages. [...] We are worldwide leaders in enamelling technology for steel bathtubs and shower trays. That gives us major strength in terms of quality, aesthetic parameters and the production costs of the products. [...] For individual employees, crucial is that they have to understand and believe in their own importance, of their own position for the company outcome (Owner and CEO, Enterprise SK11C23SSI8: 2).

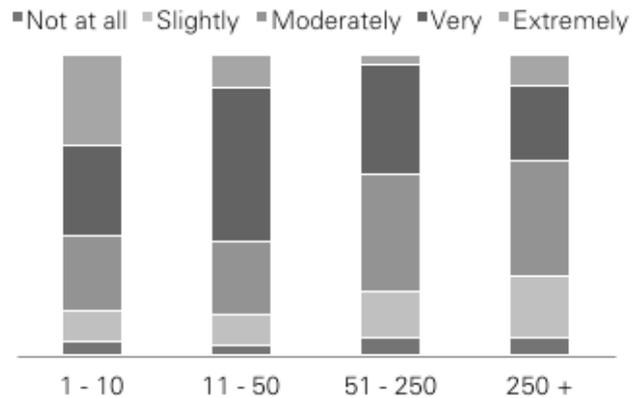
From the empirical data we gathered in our interviews and questionnaire responses, the pattern of decision-making power over work organisation is similar to ECS data results, with about half reporting they enjoy personal influence over their work, decreasing as the enterprise size increases:

Figure 10: Employees enjoying independence, decision-making power and influence over their work design



Figure 11: Employees enjoying independence, decision-making power and influence over their work design, per enterprise size

Understanding high-performance work systems means we must also examine conflicts and challenges in workplace environments



'Stress' is the most common grievance reported by employees, linked to burnouts, followed by communication problems, conflicts with clients, workload difficulties and conflicts between management and staff

Main conflicts

The sum of our findings lead to either enhanced operations and performance, such as in HPWS or the reverse; conflicts that impinge on growth or stagnation. When asked about most common workplace challenges and conflicts, an analysis of keyword responses to our empirical data highlights 'stress' as the most onerous, linked to burn-outs, followed by communication problems, conflicts with clients, workload difficulties and conflicts between management and staff.

Figure 12: Most common conflicts



Pithily, the most common workplace conflicts relate to soft skills

These point to interpersonal difficulties and other challenges that deal with soft-skills development. For example, stress and burnouts might be alleviated with either better time-management skills, or a decompression in terms of expectations from the enterprise, which may be a consequence of poor foresight, resource allocation and/or planning. Indeed, the responses provided point to the need to implement HRP that address each of the dimensions of lifelong learning at the enterprise. For example, a respondent from one of our participating enterprises in Slovakia, in the NACE A1.6 – Support activities to agriculture industry, recounted:

Health issues should be made an explicit part of HR's agenda

By the way, regarding support for employees – it just came to my mind – we haven't been talking about health issues! For the second time we have organised a medical check-up for our employees, complemented with a screening for oncological diseases. This has been very useful. In the case of one employee, we were able to identify a problem he was not aware of. We also realised that apart from education we need to support employees in a more complex way. So to avoid this employee [or others] having stress with arranging individual medical check-ups, we have made arrangements for this, and when the results come, he can act further on it. I appreciate this initiative personally, and so do other colleagues (HR Manager, Enterprise SK11AISSI5: 11).

In yet another example from a South African, medium-sized enterprise in the NACE M73.1 – Advertising sector, we see HRP related to work environment also in use, to proactively minimise communication conflicts and stress at work:

Work arrangements can help promote open communication

I think, firstly, the building itself [is of importance]. So the environment really tries to – we try to create with art and with the way the discs are placed... a very stress-free environment, an environment that even though you have deadlines, even though you are dealing with a stressful project, the environment itself or your office space is as stress-free as possible. From the colours of the walls, to the paintings that surround you, to how much privacy or too much privacy you have... We try to keep office spaces really open, as much as possible, so it creates or opens communication and there's always interaction of – with staff – but also a level of privacy. We also don't want to have our production off the premises; because we easily could do that. So as you can hear, there's knocking [building sounds] going on, there are all of these activities going on and it is actually – well for most of us – it's stimulating rather than annoying (HR Developer, Enterprise ZA11M73SSI17: 4).

Some workplace challenges and conflicts can be addresses through the detection and correction of errors (by asking questions such as who?, what?, where?, and when?) while others require a re-examination of systems, processes and values (when one can ask questions such as how? and why?)

So as we begin to contextualise some of the challenges and conflicts that employees report, we see that pressures from industry, clients, resources, etc. all influence communication patterns, work organisation in general and employee stress sources at work. Of course in HPWS, priority to responsiveness in conflicts and challenges are characteristic. And, from organisational learning theory, we know that some solutions are in the detection and correction of problems, while others require a deeper examination of and change to inherent values in the organisation of work (Argyris & Schön, 1996).

As a whole, work design and the organisation of work directly contribute to employee wellbeing and overall enterprise high-performance. The systematisation of certain aspects of HR through HR-leadership helps, however, hierarchy and greater distinction in employee status hinder HPWS. Promisingly, our respondents reported their work as being 'very' or 'extremely' challenging and that they assume decision-making power over their work design.

Also, we can perceive that a good proportion of work is being organised through teams – also a precursor to HPWS. Our study also examined workplace conflicts and challenges, where stress and burnouts could be identified as the most prevalent, with other soft skills challenges (e.g. communication, time management, client relations, etc.).

We recognise that further research would help elucidate some of the historical and socio-cultural premises for the organisation of work so that lessons learned from successful workplaces can also be better understood and more widely adopted.

Recommendations for Policy-makers

Changes are needed to the organisation of work in order to optimise lifelong learning and enterprise high-performance

The following recommendations have been formulated in line with needs identified from our empirical study, as well as needs identified from past empirical work (2002-, see Brandi et al., 2013). In supporting successful work organisation in enterprises, for lifelong learning and high-performance, we recommend:

...further empirical studies that trace the lineage of work organisation so that historical, socio-cultural and other conditions can be taken into account towards the optimisation of today's workplace arrangements. It is not enough to observe how work is being organised in high-performance work systems, or by enterprise size. There may be valid reasons why the transfer of certain work arrangements cannot take place but deeper insights into this is lacking.

...promoting policies that strengthen HR-leadership, particularly for traditional and transactional HRPs. This will translate into streamlined administrative HR-related activities, bolstering efficiency. In addition, wherever HR becomes systematised, a greater collection of data across a wide variety of enterprise sizes, industries and so forth can be collected for ongoing comparative analysis.

We encountered difficulties in cross-enterprise analysis where data is more quantitative in nature. HR-data can, for example, be part of regulatory compliance and tax-reporting structures so that employee-participation in research and the study of their perceptions, for example can be reserved for more qualitative studies.

...bolstering enterprise knowledge with respect to top-down business models and bottom-up business models. As HPWS are characterised by employee agency and autonomy over work organisation, promoting strategies that increase enterprise flexibility and adaptability will secure enterprise responsiveness to change. Dissemination of best practices for instance can be shared through public-private scaling platforms, particularly in communities of practice (e.g. profession-specific).

...greater research on and dissemination of strategies that overcome hierarchy, bureaucracy and status distinction at work. This will directly contribute to enterprise performance. Policy-makers have an especially crucial role to play in diminishing bureaucracy by, for example, making use of online systems for reporting and knowledge-sharing that can also lead to cross-analysis.

...funding and supporting special assignments and job-rotation opportunities as incentives for lifelong learning. We propose this be scaled, beginning in the public sector and promoting such activities in the private and third sectors.

...developing and encouraging team-based work organisation. This can be achieved through promoting new business models, in cooperation with employees, beginning in the public sector. We recommend this particularly in the public sector as our data shows that team-based work arrangements diminish as enterprise size grows and that HPWS are characterised by team-based work, which equally contributes to intrinsic reward needs on the employee level. The public sector could very well serve as a revelatory leader in this respect.

...immediate research on workplace stress and conflicts. Our respondents report burnouts, communication, employee relations and relations between management and staff as main struggles. Tracing these, understanding them and then finding examples as to how to overcome such challenges will directly contribute to a happier, healthier and more productive workforce.

...promoting policies that recognise transversal skills development and valuation, which can complement initiatives such as those by the European Lifelong Guidance Policy Network, including: a) an explicit policy agenda that targets soft skills development; b) funding soft skills development (e.g. short-/mini-workshops), which may also entail mobile courses so as to emphasise intercultural competence development; and c) social incentives through increased and more diverse public offerings in soft skills development.

Research Parameters

LLLight'in'Europe, enterprise-level research

The research was designed according to an abductive methodology, examining lifelong learning institutions (enterprises) as actors that actualise lifelong learning strategies through HRPs, towards value creation and high performance.

The empirical data triangulates three sources, three phases of research: 1) past empirical and theoretical work (1990-2012, see Brandi et al., 2013), resulting in a total of 69 publications; 2) LLLight'in'Europe's empirical data from 47 semi-structured interviews and 182 questionnaire responses in a total of 194 enterprises (31 EU, 163 EU-competitors), across 53 industries; and, 3) 2009 and 2013 European Company Survey results.

Three sources of data to triangulate and validate data, using an abductive research approach

An abductive research design is characterised by a transaction between data and theory as a way to account for empirical findings (Bertilsson, 2004; Charmaz, 2000; Dubois & Gadde, 2002; Locke, Golden-Biddle & Feldman, 2008; Timmermans & Tavory, 2012). It is known as a third distinct scientific research strategy, as compared to deduction and induction, developed by the American mathematician and pragmatist Charles S. Peirce (Anderson, 2005; Bertilsson, 2004). Abduction is a form of reasoning by which researchers observe the studied phenomenon or unit of analysis from a situational fit between observed facts and theory and rules. The abductive inference is aimed at developing theory and hereby validates the categories into which observations falls (Timmermans & Tavory, 2012). Morgan (2007: 71) accentuated, that an abductive analysis alternates between induction and deduction from converting observations into theory, and then evaluating these theories from observations from practice.

Our starting research proposition was the observable phenomenon of enterprise success in LLLight'in'Europe's participants, as a function of lifelong learning

The consequence of choosing an abductive research design is to base the analysis on concrete facts that need to be analysed, interpreted and understood. Our starting proposition was the observable phenomenon of enterprise success in LLLight'in'Europe's participants, as a function of lifelong learning. Building on this proposition, the underlying premise for our study is tied to the understanding of enterprise lifelong learning strategies as a significant factor and tentative principle for value creation and the actualisation of success. Our analytical focus was to study and explain how lifelong learning strategies contribute to creating the conditions for competitive and successful enterprises, framed in the context of value creation. Thus, our main analytical objectives for were to analyse collected data in order to elucidate lifelong learning strategies as contributions to the phenomenon of enterprise success, to generate observations by use of revelatory examples, and conclude with theoretical insights into value creation.

We used a three-pronged validation by cross-analysing three sources of data

Phase 1 data:
Empirical studies,
1990-2012 (see
Brandi et al., 2013)

Phase 2 data:
Semi-structured
interviews and
questionnaires

Our abductive analysis employs a three-pronged validation, by way of cross-analysing our three sets of data from data collection Phases 1, 2 and 3. Our first step in this validation process was to conduct a review of lifelong learning strategies and analyse empirical studies – Phase 1 data (see Brandi et al., 2013). The review process followed an inductive line of reasoning in that we had to identify themes and dimensions for lifelong learning strategies and value creation at the enterprise level, strongly linked to the empirical studies themselves. We therefore conducted our inquiry without trying to fit findings into a pre-existing analytical framework. The review resulted in a conceptual model for how to interpret lifelong learning strategies at the enterprise level, in connection to what characterises HPWS – enterprise success. This conceptual model guided the construction of questions for our Phase 2 research interviews and questionnaires, triangulating data with the 2009 ECS.

The second step of our analysis involved collated data from Phase 2 data, in light of our findings from Phase 1. Analytically, we were driven by the theoretical dimensions from the conceptual work in Phase 1 and conducted analysis following a theory-driven thematic analytical strategy (Braun & Clarke, 2006). We coded data from Phase 2 interviews for quite specific research questions, which centred on how enterprises understood and actualised lifelong learning strategies and value creation. Thus, our analysis in this step follows a deductive logic as we used the three dimensions of HRPs, derived from Phase 1 research to structure and corroborate findings from our Phase 2 interview data. In this way, we constructed a more detailed and in-depth body of knowledge of our HRP dimensions through how interviewees expounded on lifelong learning strategies. More specifically, to estimate the distribution of beliefs, attitudes and knowledge about lifelong learning strategies and value creation, we verified interim findings from a thematic analysis of our interviews.

Based on this, we formulated the questionnaire along the three main dimensions of HRPs, broaching interview themes and sub-features. We analysed the questionnaire results by calculating summary scores for agreement between statements made in the questionnaire and interim results from our interviews, linked to selected dimensions, sub-features, enterprise size, industry type and country. The steps we followed for this analysis were inspired by Claassen et al. (2014).

Phase 3 data: Data from the 2009 ECS, with some references to the 2013 ECS (where applicable and where cross-referencing data is available)

We conducted our analysis of secondary data from the 2009 ECS through cross-tabulation analysis among relevant and selected dependent variables for our research study on lifelong learning strategies: skills development; learning systems and incentives; and, work design and the organisation of work. Independent variables were industry type, size and country. We used SPSS v.21 to analyse data. In the cross-tabulation analysis, we focused on shared distributions between selected variables from the 2009 ECS data and incorporated a simple bivariate analysis with two variables. We also calculated data from using Chi-square tests for all cross-tabulations, in order to test the significance of our findings using the .01 levels to assess the strength of the association between observed lifelong learning dimensions and selected independent variables.

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Project Identity

LLLight'in'Europe is an FP7 research project supported by the European Union, which has investigated the relevance and impact of lifelong learning and 21st century skills on innovation, productivity and employability. Against the background of increasingly complex tasks and jobs, understanding which skills impact individuals and organizations, and how such skills can be supported, has important policy implications. LLLight'in'Europe pioneered the use of an instrument to test complex problem solving skills of adults in their work environment. This allowed for the first time insights into the development of professional and learning paths of employed individuals and entrepreneurs and the role that problem solving skills play. Additionally, LLLight'in'Europe draws on a series of databases on adult competences from across the world to conduct rich analyses of skills and their impact.

These analyses were conducted in concert with different disciplines. Economists have been analyzing the impact of cognitive skills on wages and growth; sociologists have been investigating how public policies can support the development of such skills and lifelong learning; innovation researchers have been tracking the relationships between problem solving skills, lifelong learning and entrepreneurship at the organizational level;. educational scientists have investigated how successful enterprises support their workforce's competences; cognitive psychologists have researched on the development and implications of cognitive skills relevant for modern occupations and tasks; and an analysis from the perspective of business ethics has clarified the role and scope of employers' responsibility in fostering skills acquisition in their workforce. The team has carried out its research and analyses on the value of skills and lifelong learning in EU countries, USA, China, Latin America and Africa.

The result is a multi-disciplinary analysis of the process of adult learning and problem solving in its different nuances, and of the levers which can support the development of these skills for both those who are already in jobs, and for those who are (re)entering the labor market, as well as the development of effective HR strategies and public policy schemes to support them.

Coordinator	Zeppelin University
Project Director	Peer Ederer
EU Project Officer	Monica Menapace
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Supervisory Board

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Simon Wiederhold



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Academy
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Silvia Castellazzi



Leuphana University Lueneburg
Germany
Alexander Patt



Institute of Forecasting of the
Slovak Academy of Sciences
Slovakia
Martina Lubyova



Ruprecht-Karls-University
Heidelberg
Germany
Consortium partner in 2012

This policy brief is part of the publication suite of the FP7 Project LLLight'in'Europe. The publication suite consists of 21 policy briefs, 6 thematic reports and 1 synthesis report. The 21 policy briefs discuss findings and policy implications proceeding from the project's research; they are organized along three level of analyses (persons; enterprise; country) and seven topics.

01	Resources of society for learning
02	Institutions of learning
03	Circumstances of learning
04	Role of transversal skills
05	Role of job-specific skills
06	Productivity of skills
07	Outcomes of skills

This policy brief discusses findings related to **Institutions of learning** at the analysis level **enterprise**. For further publications and multimedia material related to the project, please visit www.lllightineurope.com