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e-learning quality for sme's:
guidance and counselling

Guide to Conceive and Evaluate e-Learning Courses for SMEs Entrepreneurs and Training Providers

Implementing E-learning in SMEs

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November, 2005 – November, 2007

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1st edition

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Preface

The *Guide to Conceive and Evaluate E-Learning Courses for SMEs Entrepreneurs and Training Providers: Implementing E-Learning in SMEs* was developed under the Pilot Project ELQ-SMEs - e-Learning Quality for SMEs: Guidance and Counselling, supported by the Leonardo da Vinci Programme.

Research Institute for In-House Training (f-BB) was responsible for the coordination of the *E-Learning Guides Development.* The Workpackge 6 aims at developing a business orientation guide to conceive and evaluate online learning courses targeted to SMEs as well as at developing a technical and methodological guide to conceive and evaluate online learning courses targeted to vocational training centres and other e-learning suppliers. NKI Distance Education was responsible for the internal evaluation of the Workpackge 6.

The partnership is fully aware that this *Guide* is not a complete work. It must be seen just as a "step forward" in the attempt to provide useful materials and resources in the field of e-learning quality and ROI evaluation. The *Guide* aims at provide support and guide the entrepreneurs and other company decision-makers in the selection of the most adequate online learning programmes for them and their employees taking in consideration defined quality criteria. The *Guide* also support the objective of raising awareness among company decision makers about the advantages of online training solutions to answers to specific training needs, training areas and trainees profiles (self-oriented, self-motivated).

On the other hand, the *Guide* aims to direct training providers in the settlement of online training courses using the return on investment methodology as a quality measurement tool and a success driver. The *Guide* also provides a set of demos with best practices examples. Seven European best practices will be available in CD-ROM.

It was planned to deliver one guide targeted to entrepreneurs and another targeted to training providers. Nevertheless, the partnership believes that the same guide, targeted to both type of end-users, will be more interesting and sustainable it answer, in the same product, to one of the most demanding purposes – to find solutions that meet and correct the offer and the demand.

The *Guide* is targeted to entrepreneurs and other SMEs key persons, training providers, training consultants, training coordinators and trainers. The partnership hope that this project result will help entrepreneurs, training consultants, training providers, training coordinators and trainers to develop business orientated strategies to better promote e-learning practices in SMEs. Assuming this project as the beginning of a continuous improvement process, the partnership welcomes all contributions, suggestions and comments that end-users would like to forward.

1. Introduction

Use of new learning media in small and medium-sized enterprises (below, the "SME sector") remains still today relatively rudimentary. For this reason, the present *Guide* begins with a general description of the current "state of play" as regards developments in this direction: it once seemed safe to assume that the new media formed the perfect and predestined solution to the training and qualification problems faced by the SME sector as a consequence of rapid technological progress and globalisation; the continued reluctance of said sector to accept and employ these new media, however, has proven this assumption false.

In section one, we consider what reasons exist for this non-acceptance from the viewpoint of the enterprises in question and of the providers of training resources. In both cases, the conclusion is the same: "insufficient quality" both of the learning media on offer and of the advice and support given by the providers. The questions, then, investigated in section one are: What do we mean by "quality" of e-learning? What quality criteria do e-learning media need to fulfil? How can quality be "measured" here, how can it be produced and what exactly do training providers need to do in order to produce it? All that is brought to light in this first section as regards what must be demanded, as electronic media quality, and what firms tend to expect from good training consultancy, feeds, in section two, into the guidelines for training consultants and company decision-makers. The guidelines envisage an imaginary training consultation process in which the consultant and the relevant company decision-maker "work through", together, all the information, and all the conceivable problems and questions, necessary to an understanding of e-learning.

The guidelines consist of two parts. In the first part, it is envisaged that the company decision-maker is faced with the choice of how to meet a specific training need: by recourse to a face-to-face seminar or by recourse to an e-learning solution. He is given the support required to make a realistic, balanced decision as to whether e-learning should be introduced. The arguments for and against each one of the two learning methodologies just referred to, are examined in light particularly of the areas in which

they essentially differ. The theme of the second part is the sequence of practical steps involved in the implementation, in a company, of an e-learning process. Not all these steps, of course, will be necessary in cases where internet-based learning is introduced only selectively or via products purchased with a view to their in-built adequacy to certain needs. This means that the process-oriented method of introduction chosen here does not exclude less extensive and less complex methods of quality assurance and evaluation. In this context, it must be made particularly clear that the process in question can extend and ramify very far into the work organization and the hierarchical structures and practices of a company, requiring as it does acceptance and active cooperation from many more people than just those directly addressed by the training measures in question. It should be clearly got across that e-learning requires, if it is to work, a certain "learning culture" which should be initiated at the very latest with the start of the implementation process and be developed along with this. Among the results of the training consultation should be an insight about the fact that implementing e-learning process is a long-term benefit for the company.

The guidelines are not intended as a "scientific" text. They serve merely to introduce individuals responsible for the practical operation of certain business functions to the complexity of issues involved in e-learning. For this reason, there are no footnotes. Where sources must be quoted, they are quoted in the text. At the end, however, a list of the literature used is, of course, given.

2. Section one – current situation re introduction of e-learning into SME sector and associated problems

2.1. Initial situation

In terms of business management, human resources management and company strategy, the same good reasons for on-going training and retraining of all employees apply in the SME sector as in large-scale enterprises. In the face of intensified competition in a globalised world, small and medium-sized enterprises are as compelled as others – indeed, more urgently compelled – to adapt the skills of their employees to rapid technological progress and to the contemporary "permanent knowledge revolution", developing their competence and ability ever further. But, while employee retraining is, in larger companies, institutionalised as a key company-strategy factor, in the SME sector such retraining plays only a subordinate role. This is true, at least, for employee retraining as something formalized. Informal learning, and open learning forms, such as discussions with colleagues or experts, specialist literature, conference and trade-fair-visits, are indeed encountered also in the SME sector.

More striking even than the reluctance of small and medium-sized firms to engage in traditional forms of formalized employee retraining is their hesitancy vis-à-vis e-learning. Just a few years ago, it seemed possible to explain this by lack of technical equipment. This no longer applies. Practically every company now possesses computers and Internet access. That is to say, the Internet can be used at many work-stations for training purposes, and the costs of such retraining have also been drastically reduced by the standardization of multimedia data formats. This development has also seen employees become more competent at handling such media – a necessary basic qualification for using learning programmes – so that lack of skills is no longer, in most cases, an obstacle. The initial prognosis, therefore, was that the advantages offered by the new learning media – the constant availability of up-to-date, or immediately update-able, know-how; quality controls made simpler by certification and standardisation; the

associated cost benefits – would result in a quickly-emerging and enduring demand for such media also among small and medium-sized firms. But this prognosis has proven false.

It still needs to be explained, then, why e-learning – with the exception of non-Net-based CBT's – continues to encounter prejudice and resistance in most SME firms, and why these firms tend to put off or even firmly rule out the steps which would be necessary in order to adapt company retraining and further training practices to these new methods, when all the imperatives facing such firms in the modern world would appear to prompt to an opposite course of action. The answers which research into company training and retraining has found to these questions focus on two main causes: on the "supply side", the inadequate methodological-didactic quality of the new learning media; on the "demand side", the fact that the consultation and advice on training and qualification-acquisition measures that is being offered by providers in the field, and above all by further training providers, does not correspond to what SME firms actually need and require in the way of training and qualifications.

2.2. E-Learning products: the "supply side"

2.2.1. The quality of on-going training and retraining, considered from the firm's viewpoint

It is an insight now widely accepted that it can often be one question whether or not the training and retraining going on within a firm is one of "good quality" *for the firm* and quite another question whether a specific training/retraining product is or is not properly pedagogically and didactically developed and thus *in itself* "of good quality". Also widely accepted is the insight that we may not even, in every case, compare the learning success *actually* gained by the users of e-learning products with the benefits *intended* to be gained through the application of e-learning. On-going training and retraining ought – so the dominant view here – to serve above all to „help the firm along" in some way. For this reason, the quality of on-going training and retraining – be it carried through traditional form or as e-learning – tends always to be measured in terms of whether, or how far, it can be considered to be making *a contribution to the firm's success.* To this

extent, ensuring that quality is maintained in training/retraining matters serves the same purpose as quality management in production: quality is supposed to be a means serving the end of the firm's "value creation", or "value-adding", process. It is precisely this function, however, that firms presently fail to discover in the course of their sifting through, and even of their actual application, of external e-learning offers. Surveys reveal that many offers on the market today are not capable of satisfying the requirements of small and medium-sized firms in (to put it sharply and succinctly) *a manner focused on the **presently** existing need, **tailored** to the need in question and yet also **reasonably priced.*** These reservations are not such that can be simply dismissed:

- Even in cases where firms, or the employees directly concerned, describe, as point of departure for the use of the learning media, a *concrete problem in the daily work of the firm to which the learning might be applied,* they find in most cases, in the learning software available on the market, a training structure oriented to the established divisions of the discipline which copies traditional learning forms and requires from the training participant that he/she works through the material step by step, as if he/she was sitting over a textbook. The better alternative here is plainly *an induction into the learning programme which maintains a relation to the problem prompting its use,* and this would require above all that the training programme is structured in terms of brief content-limited modules capable of "communicating" with other modules; that it contains links to other learning elements and other learning levels; that, in short, it helps the training participant, by means of key questions isolating central problems, checklists and other learning aids, to navigate his/her way into the solution of his/her concrete problem. Learning programmes which provide no *interactive aspect* will serve, at best, only in cases where the objective is to acquire repetitive know-how; such programmes are hardly suitable for *application close to the individual workplace*.

- If the Internet is supposed to offer any advantage over traditional forms of communication, then problems presently being encountered within the firm must be communicated, and provision be made for the establishment of forums and hotlines, as well as the involvement of colleagues from the same business, tele-lecturers, and learning counsellors within the firm.

- Most of the curricula offered, being rigid, fail to make use of the potential inherent in the principle of being able to gain comprehensive access to a pool of know-how in constant evolution, and will continue to fail if they do not prove susceptible of being adapted to new demands. This adaptability would involve the integration of the know-how and experience of employees – and also company documents, pictures, data banks etc. – into the programmes, so that know-how and knowledge specific to the firm, and relevant in the widest sense to the firm's activities, is made available to all employees. This, in turn, would require *open learning platforms* which would be regularly brought up to date by the programme authors in order to tailor them to the *present* needs of the users at any given time.

From all this, we can derive **positive criteria of quality** for electronic vocational training and retraining:

Learning programmes should	Specifically
Be oriented to concrete problems and applicable close to the individual workplace	Learning programmes should involve content of concrete and specific relevance to the individual job, and individual work-situation, of the person using them.
Be capable of integration	Learning programmes should be such designed in such a way that they can be integrated into the work-process and be accessed at any time within this process.
Be modularised	Learning programmes should be structured in terms of brief modules, which can also be accessed individually.
Be interactive	Learning programmes should make available to their users facilities, tools such as checklists and the possibility of accessing, from the module/programme in question, other modules, elements and levels.
Make broader communication	Forums, hotlines, internal and external tele-

possible	lecturers should be accessed.
Be related specifically to the firm, and flexible	Training programmes must be capable of integrating company know-how, company documents, images and databases and this function must be constantly update.
Be related specifically to the user's line of business	Learning programmes should involve links to other matters related to the user's specific line of business, incl. handbooks and manuals.
Be reasonably priced	Learning programmes should be able to demonstrate their cost-benefit advantages are a key factor in decisions concerning the introduction of ratio, as e-learning media into a firm.

This list of criteria does not claim to be exhaustive. It is intended only to provide a brief synopsis, taking the form of a reformulation of those (negative) shortcomings of e-learning programmes which firms have reported into a list of (positive) qualities which e-learning programmes will definitely have to ensure if they hope to interest firms in actually applying them.

2.2.2. Definition of quality, quality measurement and quality standards

Developers and providers of e-learning programmes have by now come to understand that officially acknowledged quality distinctions are not only user-friendly but also help to set them and their products off from competitors on the hard-fought training-programmes market. This learning process has not, indeed, been an entirely voluntary one. Proven adequacy to certain quality standards was always a compulsory precondition where the production of such programmes was supported from public funds, for example, or where they were applied in such government departments as that for Labour Administration. And the growing demand for e-learning products in large-scale enterprises is also requiring greater transparency in the offers.

In fact, it is impossible to define the "quality" of an e-learning product in a way which is both unequivocal and generally valid, precisely because such "quality" must, ideally, be conceived in terms of how far the product exactly fits the real training needs of a *specific* firm. That is to say, "quality" will be directly depending on the *specific products, work-processes, and operational structures, and on the specific learning needs of the employees,* of the firm where the e-learning product is to be applied. Elaborate solutions tailored specifically to the needs of a firm will tend, however, to lie beyond the financial means of smaller companies. What is required is a measurement of quality compatible with the processes of the firm and involving the adoption of certain key viewpoints and emphases, that is to say, methods of quality-determination or evaluation which can be flexibly related to the firm in question's specifications and special considerations. There are, in principle, three very different approaches to quality-determination and measurement; these exist side by side with one another and have each of them their use and place depending on the type of need and requirement having to be met. They are centred respectively on: *measurement of success*; *orientation to the wider process*; and *guarantees for the training participant*.

Methods of **quality-determination by measurement of success** are widely used and easy to put into practice. As early as the end of the 1950's, Donald Kirkpatrick developed a four-level model for evaluating the effectiveness of training measures which has, since this time, been constantly discussed, imitated and built upon. Its advantage lies in the fact that it can also be used in the evaluation of e-learning products to be applied in smaller firms, because, although each of the four "levels" indeed leads to a more precise - that is, a more realistic - result re success of the training, each of these levels also requires a correspondingly higher expenditure in terms of controlling. Larger companies are in a position to afford, in its full measure, this controlling expenditure re extensive and complex training measures; for smaller companies, it is most often only possible in practice, but thereby also sufficient, to run through the first two Kirkpatrick "levels" in order to determine whether a product they have applied promises success in the required degree.

- The first level measures the success of the training in terms of how far the participants in it were *satisfied* with it, a datum easily gathered by means of feedback questionnaires. The questions in these questionnaires can refer to

topics such as the thoroughness with which a theme was handled, or the relevance of a theme to the specific work of a participant; they may also, however, refer to the general work atmosphere or the forms of presentation. Positive evaluations here show that there has been a basic *acceptance* of the training measure by participants in it; but they don't say, yet, nothing about the degree of actual learning success. Negative statements at this level already, of course, suffice to demonstrate non-success of the measure, because "acceptance" is an indispensable basic pre-condition for any learning success.

- The second level measures, by means of tests and sample exercises, *the increase in knowledge or capability* ensuing from the training. Useful statements here regarding the quality of the learning programme presuppose, indeed, that measurements have been made before and after the execution of the measure in question, so that the results can in fact be traced back to the training. Should a firm be primarily concerned only with ensuring that *know-how be, once the training measure has been executed, at a specific level,* the pre-test can be dropped. For training participants, and for the firm, this level is the basis for an individual proof or performance on which, as a rule, value is placed, and which can likewise, for the firm, also be classed as success criteria.

- The third level measures success in terms of *actual change in behaviour,* which is to say, it measures how far the training participant is able to put what he has learnt into practice. This is often not easy to determine precisely and the effort to do so involves considerable effort and expenditure. In the case of smaller firms, therefore, it is advisable that this level be replaced by a simple assessment from the employee's superior or by an interview with the employee.

- The fourth level measures *the results of the training from the point of view of the success of the firm*. This success can find expression in terms of time saved, better quality of work, fewer days taken off sick, and many other ways. It is only in the rarest cases, however, that such noted improvements can be shown with absolute logical stringency to be due directly to specific training measures.

The *Kirkpatrick Model* has been expanded by, among others, Schenkel (2003), who added a "return-on-investment" (ROI) level subsequent to Kirkpatrick's level four and a "product" level procedurally anterior to Kirkpatrick's level one.

This *"ROI procedure"* added to the four levels – which attempts to measure not only operational improvements but all business-related successes in specifically monetary terms by isolating all relevant factors and re-describing them in terms of their contribution to the firm's success – will tend in any case to involve too much expense and effort for firms in the SME sector. Indeed, even in current scientific discussion the validity of this procedure has been called into question (Jantke 2004).

The *"product level"* inserted by Schenkel before the first of Kirkpatrick's four levels is intended to evaluate the training measure by the gauge of catalogues of criteria and established e-learning standards. The specific objects of examination here are such input-related factors as the organization, technology, human resources, and methodologies existing on the "provider" side. The assumption underlying this added "level" is that training quality is the result of the combined effect of a whole series of specific factors. By clearly defining these factors and what distinguishes them, it should be possible – according to Schenkel – to establish criteria for the quality of a training measure, and even to check whether it meets these criteria, already before its application. In principle, this procedure corresponds to a proof of quality prior to certification.

It has been generally noted as a shortcoming of this approach that the evaluation is limited here to just *one* dimension of quality, that it remains purely formal, that neither the dimension of the process, nor that of "success" in all the different forms this may take, are taken into account, and that no real information is yielded as to the pedagogical quality of the product. It is true, however, that this evaluation approach has been widely applied in situations where acknowledgement of the quality of on-going training and retraining measures has formed a basis and precondition for public funding.

Analogously to quality management in the area of production, recent years have seen a wider and wider acceptance of ***process-oriented approaches*** in the establishment and supervision of quality also in the training field. The assumption behind these approaches

is that the quality of a measure needs to be ensured already in the process of its actual formulation, as if were "manufactured". The processual model PAS 1032-1 (PAS 2004) measures and analyses, in 6 processual stages and applying the same logically consistent standards within each stage, whether these stages satisfy the respective preconditions, goals, and firm-specific quality requirements set for them; it also ensures, by means of "feedback loops", that the e-learning product is indeed a quality product in the terms just defined. The systematic structure of the guidelines for training consultants and company decision-makers in section two is inspired by the processual categories of this model. These categories are explained in detail there.

The increase in irresponsible practices among ostensible providers of vocational training and retraining services has made necessary also a group of **approaches oriented to the "demand" side, and specifically to the provision of guarantees for the training participant.** These approaches proceed from the idea of *consumer protection;* that is to say, clear indication should be given by the training provider to the user of the training that strictly defined quality standards are being observed (as, for example, support for participants from tele-coaches and advice via hotlines, individualized treatment).

Such quality standards thereby facilitate:

- *An increased transparency of the market* thanks to documentation of the defining characteristics of the various offers, leading to better comparability between them,
- Multiple use, new combinations, exchangeability of modules etc. *savings in development and adaptation*,
- *Better quality of the products, services and processes,* because, as a rule, appropriate quality criteria tend to lead to actual improvements in quality.

Providers use different proofs of quality which do not apply directly to individual products but rather to the fact of "work on ensuring quality" having been performed by the provider. For this reason, they can provide no information regarding "training and retraining measures good from the point of view of their substantial content". The most important proofs of quality offered by the providers are:

- *Certificates* in accordance with the international complex of norms and standards DIN EN ISO 9000ff; the certificate refers to the procedure employed to ensure that the standard of quality guaranteed by a provider is actually met;

- *Seals of approval* granted by associations whose members (providers of vocational training/retraining services) undertake to observe certain clearly defined quality standards;

- Last but not least, *prizes for quality* awarded to providers as proof that their offers are of especial excellence.

As has, however, come recently to be generally recognized, a really successful choice can only be made, by a firm or by individual training users, between all the different providers and offers on the market where there exist infrastructural arrangements or institutions which render this range of offers transparent by organizing it in the form of databases and make its complexity more accessible by means of advice and consultation. A database of this sort has been developed, for example, by the Federal German Institute for Vocational Education and Training (*Bundesinstitut für Berufsbildung*, or BIBB) under the name ELDOC; it received, in 2006, the seal of approval of the German consumer-protection organization *Stiftung Warentest*.

2.3. E-Learning products: the "demand side"

2.3.1. Vocational training consultants services in the SME sector

A survey of firms carried out recently within the framework of the project "imode" organized by the German vocational training think-tank *Forschungsinstitut für Betriebliche Bildung* and focussed on the role played by consultancy on vocational training matters in the general company activity of SME-sector firms (Döring/Rätzel 2007) has made it clear that such firms tend to demand and receive consultancy services on these matters most often as part of a "package" within consultancy services, said "packages" tending to be provided by professional management consultancy firms. This means that, although advice and consultancy on vocational training and retraining matters does indeed play a role in the general consultancy offers accepted, it

nonetheless tends to appear, from the perspective of smaller companies, as just a part of some different and larger theme, such as company organization, enterprise management, or proper information and communication techniques, and not as an issue important in its own right. It is quite striking, however, in view of the real practical significance of advice and consultancy on vocational training matters, those enterprises *actually specialized in the provision of learning and training/retraining services* are plainly seriously under-represented here. One reason for this could lie in the way that the problems faced by a firm tend to be perceived by the firm in question's decision-makers, who focus first of all on the factors organization and technology, with a view to rationalizing operational processes and seeing to it that the goods/services provided by the firm are provided more efficiently. Considered from this viewpoint, the competences offered by management consultancy firms must appear, *qua* competences focused especially upon certain market segments or certain businesses/industries, the first and better choice – particularly as these management consultancy firms generally have at their disposal better and broader resources than the vocational training specialists. The supposition that this might be the reason is supported by the findings of a survey carried out among SME-sector firms by the *Bundesverband der Deutschen Industrie* (BDI). This survey revealed that managers in such firms tended to consider the use of vocational training/retraining measures only as a "last resource", to be applied where shortage or absence of skills and know-how had become a problem impossible to overlook, so that advice and consultancy on such measures from external providers tended – at least in the form of a specific service in its own right – neither to be sought nor accepted by such managers (Geldermann 2006).

Both studies mentioned make, however, the critical comment that, if specialist consultancy on vocational training/retraining matters is really to play that increasingly important role supporting and helping to form and guide the training strategies of SME-sector firms, then the profile of this specialist consultancy must be raised. What is meant by this is that the specialized vocational training consultant must be expected also to possess know-how bearing specifically on the industry and the organization he/she is dealing with; it must also be expected from him/her that he/she is able to think in business management categories, that is, that he be able to adopt the perspective of an actual firm. In contrast to these ideal goals, the suspicion is sometimes expressed that the dominant factor in advice and consultancy offers is the commercial interest of

providers in maximizing the sales of whatever actual training product they are primarily offering; it is suspected that such consultancy offers often consist merely of ready-made concepts and instruments that take insufficient account of the specific needs of the firm and of the concrete business and operational know-how already existing; and that the consultancy process is often not conducted in a co-operative manner. The question of how far this is true, of whether this view is based on real negative experiences or whether it was to do with a prejudice is one we cannot deal with here. It seems to be no doubt, however, that the role of vocational training consultants have changed; there has occurred a shift from the mere getting-across of certain bodies of know-how to a step-by-step accompanying and supporting of on-going learning processes, this latter function being called upon to find answers not only to the increasing shortage of properly skilled employees but also to problems connected with demographic change. It is in such connections and contexts that the skills of specialist vocational training consultants are now being called upon, which means, in turn, that their key competences must be developed in these directions.

2.3.2. Consequences for vocational training/retraining providers

Alarming reports from the labour market suggest that the shortage of skilled workers is likely to become still more serious. Such political solutions to this problem as the granting, in larger number, of work permits to skilled workers from other EU countries tend, for various reasons, not to be attractive to SME-sector firms. Such solutions fail really to address the main problem here, which is that of each firm's having a need for skills and qualifications *corresponding specifically* to its own operational and organizational processes, since any skilled foreign workers recruited to fill the "skills gap" would still have to acquire, in addition, these "firm-specific" bodies of know-how.   The problem is a similar one in the case of older employees whose training for their trade or vocation lies, in most cases, decades in the past and whose competences need to be adapted to new demands. In the last analysis, SME-sector firms have simply no choice but to continuously train and retrain their employees so as to raise their skills to that required level which is determined largely by the type of technology being applied at any given time. This necessary strategy is failing, just now, to be carried through, however, not only due to a lack of resources but also due to a human resources policy which is, in

most cases, directed only by a short-sighted concern with the firm's success in the immediate present.

External consultancy on vocational training matters could decisively improve this situation, preventing only that vocational-training institutions succeed in establishing a long-term cooperation with firms and businesses and in overcoming the still-existing separation between providers and "consumers" of the products here provided. Because – in distinction from what is required in the case, for example, of attempts to design ready-made e-learning study courses in a manner correspondent to users' needs – the development of training/retraining measures apt to be applied „close to the workplace" – that is, within the context of specific work-tasks performed by specific employees in specific firms – is impossible without an intensive cooperation, based on mutual trust, between consultants and company decision-makers, and even between consultants and company employees. Where this does not occur, there is no hope of adequately gathering the data relating to, and goals set for, training and retraining requirements and translating these into a real vocational training programme.

For most ***vocational training/retraining consultants*** there follows from all this a new field of professional tasks and duties and a **new profile** in terms of the demands that may legitimately be made upon them:

- They must be able to quickly and competently acquire the *know-how regarding the specific industry and market* required in each case; must understand the specific *production processes, work sequences and organizational structures* of any firm considering using their services; and must also be able to *adopt the perspective* of such a firm;

- They must be capable of competently initiating and sensitively guiding the process of finding out what a specific company actually and objectively requires from them in the terms of training consultancy and training; this is as important as the interests of the potential training participants, of their superiors, and of the firm as a whole are in many cases not identical; many firms are not happy to see their employees drawn into the process of determining what is required in the training;

- They must possess a comprehensive knowledge about existing *databases* bearing on the diversity of e-learning offers and must constantly keep this knowledge up to date;

they must be in a position to draw out from such databases reasonably-priced solutions, and to adapt or expand them; that is to say, they must be good judges of the *quality* of e-learning products, so as to be able themselves to offer to firms a consultation of "tailored" quality;

- They must be capable of accompanying step-by-step, with relevant advice, even a rather complex installation process, and of developing, where problems or conflicts emerge, solutions acceptable to all parties;

- A specialized professional competence in consultancy matters is, however, only a *necessary* – not, in itself, a *sufficient* – condition for the trust that firms must have in them in circumstances where firms need help in a difficult situation but are definitely not willing to expose themselves to a critical examination by some outsider. For this reason, there must be initiated and cultivated, longer-term relations of cooperation and networking, through and thanks to which the consultants and their training institutions/arrangements will gradually become *those to whom firms will naturally and self-evidently turn to* in matters of training and retraining. Not least among the advantages here is a sparing, thanks to the simultaneous and common usage of both e-learning products and consultancy services, of the scarce resources characteristic of SME-sector firms.

It need be pointed out that the whole group of different competencies just outlined is hardly to be acquired by any individual employee in any viable space of time. That is to say, the demands of such a catalogue of requirements can only be adequately met by *teams* of vocational training/retraining experts. It is at this point, then, that the *supporting organizations* come to play a role. These latter must set training for their training consultancy experts – *within their own organizations* and/or *with external help* – for the more comprehensive tasks they need to take on.

For this reason, there was developed and tested, within the Federal German Institute for Vocational Education and Training and in the context of the model experiment "*Use of Interactive Learning Media in the SME Sector*" (BIBB 2006), a concept for on-going vocational training which supports, by means of e-learning, firm-external vocational training centres in the development of customer-oriented and economic business models. The goal here is that the vocational-training providers, subsequently and additionally to the actual training, reacts independently to the market, track down new

trends, and see to it that these feed into their consultancy services. It is now planned that this process be initiated, supported and furthered by precisely targeted advice, in cooperation with selected providers from the areas of industry and the manual trades. Among the conclusions which we may draw from it is that the efforts of vocational training centres to determine the customer-related training needs of firms and to satisfy these needs with the help of new media must be supported and promoted more strongly than they have been. Other regional and trans-regional institutions have also recognized the necessity of this task and are currently developing – in most cases with the support of EU funds – programmes designed to provide vocational training for those whose vocation is "vocational training consultant".

What does a company officer with responsibility for further training and retraining have to bear in mind before deciding between "e-learning" and traditional face-to-face training sessions?

As an operational decision maker in the field of further training, retraining and qualification in a medium-sized enterprise who, together with an external vocational training consultant, is "working through" these guidelines, most of the questions and problems are already known to you from your experience in this field. It's possible that you didn't always decided in the past to draw up a checklist for certain measures, and perhaps you often had to work under pressure to solve a problem, but at all events you included business-related, organisational and employee-related requirements and costs of vocational training in the aspects you considered.

The vocational training guide you have now in your hands has been drawn up to help you make a pragmatic decision weighing up realistically the alternatives of "traditional learning" – normally in the form of seminars or other forms of face-to-face training, "e-learning" or also the hybrid form, "blended learning". However before you do this you should find out *what* the employees of your company need to learn. *And this is not yet just a matter of defining exactly the learning content and aims but also the character of the training content.*

Is it a case, for example, of supporting learning at work while working or in work time through production or information tools available at the workplace? Or is it the case that employees either as individuals or groups need to acquire new kinds of work-related knowledge? Should information relevant to the work situation simply be accessed rapidly? Or should software exercises be carried out by means of a computer simulation (not real-time) to avoid risks and costs? Whatever operational situation you happen to be in, a definition of the character of the learning content is necessary to develop a further training and retraining program with respect to time, cost and organisation and above all, one that is acceptable to your employees.

Looking at the situation generally, the learning goals and content will be limited by the know-how your employees already have at the beginning of the new training program, and by the need for them to recognise the relevance of the training to their work. The more the content suits the work situation in each case the faster it can be implemented and the greater the willingness to learn and the success of the training. However, if it isn't obvious which deficits in knowledge or qualifications are causing the problem to be solved by suitable training measures, it is the task of an *external vocational training consultant* to support you, in determining the *training requirements to solve the problem*, and to find or develop together with you on the basis of the huge number of vocational training programmes available on the market, the "most suitable" programme for this situation with respect to quality and costs.

Up to this point the initial ideas regarding the goal and content of the *further training or retraining* in the form of traditional training sessions are exactly the same as for *e-learning*. Significant *differences* arise between the two forms of learning if they are compared with respect to:

- Character of the training content
- Type and constitution of the learner group
- Resources and basic conditions
- Individual characteristics of the learners

The questions arising in the various cases will be analysed in the following pages, and the alternative types of *further training or retraining* programmes in each case will be

compared with each other with respect to the advantages and disadvantages of their use in practice.

Character of the training content

It is self-evident that qualitatively and quantitatively differing contents call for different forms of vocational education.

1. If it is a matter of know-how with a "short half-life", i.e. it soon becomes out of date and hence modifications are necessary at short intervals, and then because of the continual updating required, face-to-face training sessions would be both impractical and too expensive.

2. Is it matters of know-how that can best be disseminated in large "chunks" – at long intervals – or does the character of the content in question make it necessary to offer it at short intervals in small "knowledge portions"? In the latter case it would be either impractical or even impossible for course participants to attend face-to-face sessions even if the workplaces of those concerned were close to each other. Regular updates, e.g. of product information, can therefore not be disseminated via seminars (of short duration). It was not be coincident that e-learning has become the first choice of manufacturers and service providers, and also the choice for passing on information between sales departments and sales representatives of the same company. The use of integrated network-supported communication ensures that the available e-learning programmes are not at all inferior to the traditional (face-to-face) seminars with respect to reliability of the learning material or the possibilities of placing questions and controlling the session otherwise. On the contrary, the possibility that learners are able to call up the material over and over again is a clear advantage of e-learning. Thus we see that the *scope of the learning units, which can be worked through individually*, is an important criteria for the potential usefulness of a form of learning.

3. What *relevance* does the learning content have in each case *to work*? Is it intended that in work-related situations access should be made rapidly to large

information pools, which provide material of the widest variety like, for example, text, forms, image documents and videos? In this case e-learning has considerably higher benefits – providing, of course, that a computer is installed at the workplace – because the work of the employee concerned must be supported in a convenient manner, without him/her having to leave his/her workplace in order, for example, to go to a library or the archives or to get information from a company specialist. But general and specific information for problem solving and acting in accordance with a proven, relevant procedure can of course also be called up from the network. Cost-benefit calculations provide then a clear answer with respect to the use of the resources described in the following section of these guidelines.

4.   In addition to the known possibilities of "*multimedia*" the variety of media material like written and spoken text, original recordings of all types, photographs, drawings, animation, videos etc. attract the attention of the learners or provide them with interaction possibilities like, for example, questioning experts, repeats, new ways of looking at an object, or other ways of learning.

5.   If the learning medium and learning material are identical, as is often the case for software training, e-learning is just what is needed because of its *affinity to the digital information and communication media*. Explanations of the text, using highlighting for emphasis, exercises and, not least, help functions make the target applications easy to understand and the information to be assimilated – in contrast to face-to-face seminars, in which software dissemination and practical application must first of all be omitted. Even technical objects and procedures can be simulated realistically on the PC monitor. By means of spoken text, visual emphases etc. the learner can perform practical exercises using the keyboard, the mouse or other means of data entry. The flight simulator is the most "prominent" example of these. The affinity between or identity of the learning medium and the subject matter are an unbeatable argument in this cases for using e-learning.

6.   The examples given up to now refer to learning content of which the main aim is definitely disseminating "declared" knowledge and/or knowledge-based activity routines, for which the use of e-learning is demonstrably superior to face-to-face training sessions.

If, however, learning content and aims concern sustainable *changes in behaviour* and/or *changes in attitude*, the learning processes can hardly be successful without an accompanying intervention of trainees. In these cases individual elements of the learning goals can definitely be efficiently disseminated by e-learning, but the presence of instructors/trainers and learners is however indispensable – simply because the objects of communication are subjectively determined and perceived, and frequently have a non-verbal and ambiguous character. Face-to-face seminars cannot be replaced in these cases; however "blended learning" can be a good alternative.

Type and constitution of the learner group

In the following section it is shown how the arguments for or against e-learning depend on the size and homogeneity of the group and also on its "fragmentation" with respect to location and time available for training sessions.

1.   It must first of all be made clear that licence charges for the learning materials and also the production costs for company-specific further training or retraining materials are independent of the number of learners. This could give rise to the impression that for small or medium-sized enterprises with only a few users expensive standard e-learning products or those exclusively produced for the company are just out of the question. However there are alternatives. Even reasonably priced standard instruction programmes can be modified using one's own integrated learning content for company-specific questions or, as another alternative, individual learners can be integrated in to sector-specific, electronic training sessions. You should discuss what would be best in your particular case with an expert who is familiar with your company-specific requirements and also has a good idea of which e-learning products are available on the rather opaque market along with how they meet the relevant quality criteria. You will be supported by the vocational training consultant in such a discussion and also when carrying out the corresponding cost estimates

2.   If the learner target groups cannot be brought together or it is very difficult to do so, because say many of the learners have to receive instruction on the job or are away at customer locations at different times and hence not available for training, there will be

a preference for e-learning. Those in the target group can consider individually, their availability both from the point of view of work and their private responsibilities.

3.   In addition, the *physical separation* of the learner group, possibly not only with respect to workplaces on one site but also with respect to different locations, means that costs of bringing them together would increase with distance from the location where the instruction takes place. In this case clear cost advantages arise from using electronic media.

4.   E-learning provides individual ways of learning to learner groups that are *inhomogeneous* with respect to previous knowledge, learning speed, opportunities to participate in instruction, etc. Being able to choose and control the learning modules and the possibility of repeating particular steps and spending more time on them enable and support the individual learning process. If in these respects the learner group is highly inhomogeneous, *joint face-to-face seminars* will assume the function of bringing the members who will agree on the location.

Resources and basic conditions

Whether your employees need e-learning at all depends also on the technical, staffing and organisational conditions existing in your company.

1.   First of all you must have, of course, in your company a suitable *IT infrastructure,* the basic condition for learning at or near the workplace. After all, if PCs capable of multimedia operation must first be procured and then connected together in an internal network, this would incur very high costs that would counteract the economies that would otherwise ensue. However that is nowadays not normally the case. But even suitable equipment is no protection against technical problems. If say you have a "firewall" for data protection and to avoid staff misuse of the computer, this can make it difficult to access to many of the e-learning programmes on offered. To find the most practical solution you should take the advice of your IT officer. In particular if you intend in the long term to change over to e-learning, these initial costs and also the larger initial investments will in the long-term be amortised.

2.   It should also be checked whether the *learning environment of a workplace* permits undisrupted learning. If for example the workplace is extremely noisy, subject to frequent disruptions or is poorly illuminated, the learning effect will be zero. Separate study rooms or divided off parts of rooms can be the answer in this case. Checklists, which your vocational training consultant has at his/her disposal, can be used for checking which aspects are to be accounted for when improving the "ergonomics of the workplace for learning ".

3.   Not every company has the possibility of having a *trainer in attendance* with the knowledge and vocational training competence that matches your current requirements. In this case suitable e-learning courses fulfil the function of trainers in attendance. These e-learning courses are accompanied by "tele-instructors", who answer the participants' questions and correct exercises.

4.   If you wish to change over to e-learning for further training and retraining, while continuing to employ the training staff you already have, you will possibly be faced with problems affecting the *acceptance of the new medium*. The people concerned need a certain *IT affinity* to change over from traditional forms of learning to e-learning. After all, is not just a matter of transferring an old learning culture to new media; it's more a matter of adopting new methods of training that, on one hand, have a high learning potential but, on the other hand, place higher requirements on the self-learning competence of the learners.

5.   Another aspect needing to be checked is the learning culture accepted in your company. If for organisational reasons or because of traditional attitudes the new possibilities of, for example, a free choice of periods of instruction, freedom in choosing the subject matter, or permitting the learners to contact the experts or trainers individually, are not wanted, then e -learning's flexibility will not be used. At all events it will be difficult and this will have a counter-productive effect on the motivation of the learners.

The most important factors influencing e-learning's success in your company are connected with learners, their abilities and their willingness to get involved with e-learning. For these company employees *media competence and acceptance* of electronic forms of learning are indispensable. After all, they are the people who must accept the learning programme offered, use it and then implement it within the company.

1. *Target groups for whom further training and retraining was traditionally rarely necessary and hence not of interest* normally have problems with this forms of learning calling for working on one's own initiative and learning competence. If they take part in training within the company they consider the personal contact with trainers to be important, and the social aspect of learning is also important for them. From surveys it is known that in this group there is a disproportionately high number of people who were educated at either a *Hauptschule* or a *Realschule*[1]. Normally they also have a lower level of *computer competence*, i.e. computer-aided learning is unknown to them. However this does not necessarily mean that they have no interest in this form of learning, but they must be supported in attaining the computer competences. In addition the *absence of regular reading habits* also often militates against the successful use of new media. But in this case too the use of audio, visual and simple text media to their full extent can definitely be suitable for supporting self-learning processes for people not used to read.

Because most company employees have their training experience largely from face-to-face training sessions, the didactic concept must first of all be oriented to these learning habits, i.e. a high amount of personal contact with these users makes it much easier to encourage them to learn on their own.

2. It is completely different for those target groups for whom *learning via further vocational training is a matter of course*. They take part in both face-to-face sessions and e-learning, and for them informal learning on their own initiative is common as well. If

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[1] Translator's note: The German state school system is selective. The *Hauptschule* is for the least academically gifted students and the *Realschule* for those with average academic gifts (The *Gymnasium* is for the most academically gifted students).

those requiring instruction in your company tend to be members of this group then the introduction of e-learning in your company will have an enthusiastic reception.

But independently of the constitution of the learner groups in your company who would be affected by the introduction of multimedia learning processes, even unfavourable conditions do not have to be grounds for not introducing e-learning if you start off with a preparation phase for these learners. In particular when optimising your company for the use of new information and communication technology e-learning can be used as an important element in the reorganisation process.

Instead of a **summing up** we have inserted a checklist on the following page, which gives you another chance of forming an overall picture of the questions just dealt with. It should support you in deciding what vocational training concept is best suited for your company and employees.

1. Checklist: potential benefits of e-learning compared to face-to-face training sessions

Content	1. Half life	long	☐ ☐ ☐ ☐ ☐	short
	2. Closeness to ICT	minimum	☐ ☐ ☐ ☐ ☐	maximum
	3. Work relevance	Low	☐ ☐ ☐ ☐ ☐	high
	4. Requirements on multi-media capability	low	☐ ☐ ☐ ☐ ☐	high
	5. Proportion of learning units to be worked through separately	quite high	☐ ☐ ☐ ☐ ☐	very low
	6. Relevance for learner's attitude	high	☐ ☐ ☐ ☐ ☐	low
Learner group	7. Size	small	☐ ☐ ☐ ☐ ☐	large
	8. Members' availability	easily planned	☐ ☐ ☐ ☐ ☐	difficult to plan
	9. Members' locations	concentrated at one site	☐ ☐ ☐ ☐ ☐	distributed over several sites
	10. Homogeneity	high	☐ ☐ ☐ ☐ ☐	low
Resources / basic conditions	11. Availability of trainers in attendance	adequate	☐ ☐ ☐ ☐ ☐	inadequate
	12. IT affinity of training personnel	low	☐ ☐ ☐ ☐ ☐	high
	13. Acceptance of e-learning by training personnel	low	☐ ☐ ☐ ☐ ☐	high
	14. Organisational environment	unsuitable for learning	☐ ☐ ☐ ☐ ☐	suitable for learning
	15. IT infrastructure	needs to be procured/opti-mised	☐ ☐ ☐ ☐ ☐	available
	16. Learning culture of the organisation	hardly exists	☐ ☐ ☐ ☐ ☐	clearly exists
Individual learner characteristics	17. IT affinity	low	☐ ☐ ☐ ☐ ☐	high
	18. Acceptance of e-learning	low	☐ ☐ ☐ ☐ ☐	high
	19. Reading habits	hardly exist	☐ ☐ ☐ ☐ ☐	clearly exist
	20. Ability to work on one's own/self-learning competency	hardly exists	☐ ☐ ☐ ☐ ☐	clearly exists

According to Reglin f-bb, Studie zu den Potenzialen [Study of potential], 2005

3. Section two – how should e-learning be implemented?

Depending on the extent of network-supported training in your company, implementing e-learning will affect to a greater or lesser degree both the well-tried aspects of your work processes and the training habits people are loath to give up. At the beginning this will lead to some unrest.

As studies of the willingness of the employees of medium-sized enterprises show, not all those concerned are pleased to hear that company vocational training is planned in the future to be carried out partly online. Surveys on the use of e-learning programmes already implemented even reveal that not even a half of the employees make use of them. They see only a number of new requirements for themselves and their environment, which inhibit them from really getting to grips with the new medium and taking advantage of the online training. If right from in the beginning the acceptance is missing then the chances of developing motivation and achieving self-discipline will be low – but these are essential for learning success.

There are many factors obstructing the necessary acceptance. The most frequent reasons named by employees asked are as follows:

- Even their superiors do not really accept the online working methods and hence their affected subordinates feel they've been left in the lurch. Moreover it often happens that middle management sees itself confronted with an instrument that apparently reduces its management role. After all it's not only the learning employees who are affected by the new forms of learning but the whole organisational environment of the company.
- The employees concerned miss communication with tutors or other participants: they would like to have the well-known face-to-face training sessions. Furthermore they were previously used to "consume" passively learning content presented by the tutor. It is true that this did not interfere with the smooth running of the session; the participants simply let the content go over their heads. But of course in the case of "self-learning" this is no longer possible.

- The employees realise that online training requires from them an unusual degree of work on their own initiative. Working on their own responsibility with respect to the learning process and learning success, requires from them to access and work with new information and learning materials. With traditional training methods this was normally not required and they do not necessarily have the required abilities or habits for this.
- If on top of all this the e-learning programmes they have to use are of low quality or do not really meet their requirements or those of their workplace, or even have technical defects, then they will probably refuse to work with online training before getting properly involved with it.

This means that when e-learning is implemented the participants must first of all be *convinced* of its advantages and benefits. Furthermore their fears and anxiety must be recognised and dealt with, the real reasons for their lack of acceptance be discovered, and the necessary support be offered to encourage acceptance. This means that what in the course of time has become a "must" for every external training company, should also be practised by the customers: in-house training marketing is indispensable for the success of e-learning.

The following introduction to the various steps of the process, during and after the implementation of e-learning programmes, is intended to provide you and your employees with an overview of how this process works in practice in order to transform a rather vague feeling of unease in an active participation in the planning process, from those involved.

Planning, development, execution and quality control of e-learning measures – a process in six steps following a preamble

For the reasons just given, before the first step itself, the employees involved must be integrated into the process and their acceptance be achieved by suitable information.

Preamble: information for all those involved

Those employees who will probably be affected will be *informed well in time of the reasons and the occasion for the programme of further training and retraining*, because without their participation an analysis of the training requirements, aims and content can not be performed in a way that takes sufficient account into the workplaces and the overall situation. Another finding of a number of studies is that the willingness to learn new content depends upon the extent it can be used at the workplace and also the speed of implementation and success of this use. Furthermore vocational training imposed from above eliminates as a rule any potential willingness: the employees choose more or less openly "internal migration", which in the case of e-learning can even occur unobtrusively, whilst on the other hand their integration into the planning motivates them right from the beginning to further participation.

Last but not least, *incentives* like the prospect of an increase in competence, possibly along with a promotion or an extension of the area of responsibility, will increase the willingness of those who otherwise would be difficult to motivate for the new form of learning because of the advantages they intuitively perceive in face-to-face learning.

If the company shows trust in an employee who learns in his/her leisure time by giving him/her time off in compensation or by paying for the cost of the instruction then they can be almost sure of his/her acceptance. In addition to financial incentives and other forms of recognition, however, the *further training certificate* plays an important role.

If you have carried out this first step successfully the actual process of the implementation or the change over to e-learning programmes can start. Of course, in the case that the planned training should make a productive contribution to the success of your company, its quality assurance requires that the *process of developing the vocational training product* is supplemented by appropriate *controlling* procedures. This should not be a matter of complex control procedures on the basis of comprehensive lists of criteria but also not a number of subjective opinions of the learners regarding their learning success. Instead, the usefulness of the vocational training product must be ensured *in the conditions existing in your company*. The fact that there is no "unique" measure of quality of further training and in particular of e-learning, is an important reason for devising together with you practical criteria for setting training aims and also

for providing suitable technical and organisational conditions. So we see that every step is carried out and monitored according to the criteria of whether it is sensible, effective and also "appropriate" to your company and its employees.

For this quality assurance process the German Standards Institute (DIN eV) has developed process categories under the title PAS 1032-1 to which our approach is oriented. It reduces the complexity and time-consuming inspection procedures to a level suitable for use in a medium-sized company.

The following table shows the process categories and steps pursuant to PAS 1032-1 and describes the requirements/process steps included in the categories.

Process category	Process steps
1. Determining requirements	Problem description, determining learning goals, training requirements
2. Basic conditions	Learning environments not optimised for learning processes, learning locations, allowed time, organisational rules
3. Conception	Draft for target groups and media programmes offered that are adequate to meet learning goals
4. Production	Feedback loops
5. Implementation	Stakeholder inclusion
6. Execution	Flexibility, certification
7. Evaluation	Quality assurance and cost effectiveness review

The PAS 1032-1 process categories (column 1) and process steps for quality assurance of e-learning in the company (column2: diagram modelled on Reglin 2006)

3.1. Defining requirements

In this first step the requirements for further training are defined along with the training aims and the requirements of those taking part in the training. To achieve this you need to describe clearly the basic problems to be solved so that together with the vocational training consultant the resulting training needs can be determined. This description must have a certain amount of detail: For example, simply to say "the interim balance sheets are never prepared on time" is not sufficient to infer with certainty that there is a requirement for further training. But if it is the case that the problem arises neither from the organisation and methods of the work in question nor from a lack of communication but from the fact that the individual employees or the department concerned do not have usable software at their disposal with which regular queries can be processed in a routine way, this software must be obtained or developed, and those involved trained to use it. Another possibility is that the software already exists but the users have not mastered it because of being under permanent pressure and never having the opportunity of getting to grips with it. You can see that when identifying training requirements on the basis of a problem, those concerned must definitely be involved so

that the definition of the learning goals exactly matches the problem and you can come to an agreement with them right at the beginning on the need of improvements of the current situation. If those concerned have the impression that they are being involved in a meaningful way in the definition and determination of requirements and hence recognise that their opinion is valued, then the necessary acceptance and motivation will come about.

More complex problems too can be defined precisely by the inclusion of the company workers, who after all have to do the work. With their support the requirements and aims of a training project can be defined in a more accurate way. If for example you wish to draw up a list of training requirements for the whole company, questionnaires can be distributed to all employees that include questions on all company topics for which the employees can show a requirement for additional support. Experience from other companies shows that most company employees do articulate concrete learning needs if they are asked accordingly. The analysis of these questionnaires should be carried out together with the executives, supported by external consultants, and then discussed with the employees.

3.2. Basic conditions

It seldom happens that the working conditions of a company are not conducive to efficient learning. After all, the workplaces were set up according to other criteria than those for learning processes "independently of available time and space", as e-learning is sometimes defined; hence it is essential to *secure a satisfactory learning environment*. We have already considered "resources and basic conditions" from the point of view whether they are conducive for e-learning. In this phase it is a matter of the senior management together with other executives ensuring favourable conditions for learning: learning areas must be set up to allow undisrupted learning. In addition the timetable for learning, firewall regulations, etc. must be determined.

At the same time it must be taken into account that not only those directly involved in the training but also their superiors and immediate subordinates are affected if it should happen that work processes change or the people undergoing training are absent for a

certain time or cannot be disturbed. For attendances at face-to-face seminars in the past these absences were accepted and could also be planned for in advance. For the new e-learning situations all those affected should agree with the new regulations so that the learning times do not lead to disruptions or misunderstandings at the cost of all those concerned. For this reason agreeing the timetable of the training sessions not only with the superiors but also with one's colleagues is a great help.

We see that learning must be supported explicitly, and that's the reason why the superiors of those involved in the training have a key role to play. Their attitude towards further training and retraining as an important "resource" for the company is conducive to a pleasant learning climate in which the other colleagues affected also show their support, in particular if they have some benefit from the new know-how by being informed of particularly interesting parts. The more employees who can take advantage of the e-learning programmes the more all employees will show understanding for those colleagues directly involved, and a general improvement in the learning culture will normally be observed.

3.3. Conception – the core of product development

The conception of the further education measures is the *product development core* because at this point:

1. Decisions are made that in the further course of the implementation can only been revised with considerable effort. For this reason the decisions should be made very carefully and take into account the possible alternatives.
2. The co-operation, support, initiative and creativity of all those involved in the development process is required if the learning goals are to be achieved in each case.

What *type of learning software* should be used or developed and installed in your company depends – assuming that your company has the necessary technical and organisational infrastructure – on one hand, on the learning goals and content and, on the other hand, on the requirements of the employees – both defined in the first phase. As most of the learning goals can be achieved by alternative routes, *it is necessary to*

choose a conception in this phase that corresponds most closely to the learning goals and the learning process.

Let's consider now the *target groups for further training*. As a first approximation these can be reduced to two types, which in their characteristics and attitudes towards e-learning differ significantly:

- The target group whose members have high media competence and normally a computer workplace, for whom acting on one's own initiative and self-learning competence can in general be expected, presents few problems. Generally speaking this group is easily motivated for e-learning, and is open for learning programmes with a modular structure that during work time or in particular work situations can be easily called up and used. The members are normally also informal learners, i.e. they search for information on their own initiative using programmes offered outside the company. We shall come back to them later.

- It is more difficult to motivate the other group, i.e. the target group with no media and self-learning competence. To remove their fears of "technology" and "the computer" you often need to spend some time addressing the members of this group before the implementation. A "patient" introduction and implementation along with exercises carried out successfully can trigger off a marked increase in motivation. Even then, however, you cannot expect a complete transfer to online learning from one day to another without friction. For this reason we recommend for this group blended learning programmes with a high proportion of face-to-face training. It is absolutely necessary to plan for intensive support by tutors and the possibility to reach a tutor in the self-learning phases and also for the possibility of discussing problems with other participants.

- But even for the first target group face-to-face components are important because these are needed not only for coordinating or synchronising the training progress of the learner group but they provide social and communicative aspects, which play a significant role in the company's internal processes.

Let us now address the learning goals. A systematic overview can be found in the following table. In the course of the steps, questions that are important for choosing or developing learning software are included and explained. Using examples the relevance that these have for the anonymous companies selected the relevance is shown. The examples have been taken from a study of the [German] Federal Ministry of Science and Technology for the application of electronic knowledge management programmes in medium-sized enterprises and also from project case studies.

E-learning types according to learning goals:

Learning goal	Type of learning software	Requirements on characteristics/quality
1. Rapid access to required information	Information tool	Open structure; unrestricted access; low degree of learning skills required; instruments for use in practice; "looking up mode"
2. Increase in existing knowledge	Modularised learning instrument	Plurality of ways of learning; can be used systematically or ad hoc; self-learning competence required (selection, transfer)
3. Acquisition of new areas of work-oriented knowledge	Electronic training course	Sequential working on the basis of the learning material structure; relating to work activities essential
4. Skills / ability to take action acquired in a secluded room	Practice tool	Sequential working on the basis of practical problem definitions up to identification; simulation character; practising routines, e.g. using application software
5. Help in creative problem solving processes	Discussion forum, platform for exchanging ideas and information	Support for problem processing; communication platform
6. Structuring creative processes	Production instruments	Visualisation and structuring aids

(According to Reglin, 2003)

Learning goals type 1: rapid access to required information – information tool

You can have rapid access from every computer connected to the company's internal network to all data relevant for the company with a company **database**, which can contain documents, images, engineering drawings, tables, etc. They can be supplemented by manufacturers' **support databases**. Once a database has been installed and it has been decided which data is relevant for it, it must be subject to continual maintenance, i.e. updating and adding to the data. Information systems and databases are normally passive but are activated when they are accessed. Using them is easy to learn for every company employee. Authorisations for access to particular types of data must be issued.

In many companies, including medium-sized companies, databases are the basis for an effective knowledge management, for in today's globalise economy a lead in available knowledge often leads to a competitive edge. Databases with the respective authorisations are also often used in dealings with customers.

Real life example:

A medium-sized enterprise with 12 employees in the "commercial services" sector wished to make company-related knowledge implicitly possessed by the employees more explicit and hence easily accessible in the database, in which it would be administered and kept up to date. This was realised using in-house IT competence. The system permits access to knowledge that previously only existed implicitly, for example in the chief executive's head. The more the company workers and customers access this databank the more the chief executive has time for other tasks, and the customer's profit from this too – the system deals with their enquiries rapidly and is accessible 24 hours a day.

Learning goals type 2: increasing existing knowledge selectively – modularised learning instrument

You have discovered that employees of your company wish to build on existing knowledge without, as is the case with face-to-face training, having to start with the basics or having to repeat what is already known. This requires a learning programme in which the learner himself/herself can control progress. The concept of this type of learning programme is called **hypertext**. Hypertexts do not necessarily have a linear structure, as for example is the case with face-to-face training, but are structured modularly. The modules, as self-contained learning items, can be selected and controlled individually. They also contain links that permit a problem-oriented combination of learning elements, and can also include images, audio items, video items and animation. In addition hypertexts can be tailor-made to company-specific requirements and also be added continually, extended and updated. However, hypertexts that aren't "off the peg" are also not cheap.

Navigating hypertexts requires a certain media competence and a definite willingness for self-learning. If we can assume that this is the case in the target group, hypertexts provide the optimum for ad hoc use at the workplace or wherever and whenever there is a demand for information.

Real life example:

A medium-sized enterprise with 65 employees in the "heating and sanitary fittings" sector was faced with the situation that, as a result of growth and fluctuation, it was no longer the case that every company worker knew all procedures and all product specifications, and this had unfavourable effects when dealing with customers. Online training sessions have been in use since then, as a countermeasure for function-based and interdisciplinary. These sessions put the company employees in a position to advise customers generally on all matters. Nowadays the sales staff is able to answer technical questions, and on the other hand, the technical staff is well-informed on sales issues. This means that *all* staff members are no longer disturbed by time-consuming and often fruitless internal telephone calls and the customer profits as well: he/she needs only one contact in the company.

Learning goals type 3: acquiring new areas of work-related knowledge – electronic training course

If a company enters new business segments and there is a threat that those employees who have been in the company for many years will not be able to cope with the up to date function-based know-how required, or they are expected to assume new functions, further training and retraining will be necessary. Some years ago face-to-face sessions that took place at work or during work were the only possibility to catch up with current know-how. Disadvantages like cost and loss of working time are well known. Nowadays **electronic training courses**, also known as **tele-learning**, provide completely new possibilities of integrating work with learning. There are on the market a large number of these courses of high technical and didactic quality that do not have to be adapted especially to your company and can therefore be installed at reasonable prices. Whether however you simply buy an electronic training course and have it installed depends on how many of your employees would be affected. Normally such a purchase, i.e. paying a licence fee, is only worthwhile for larger companies. Furthermore attendance by an instructor or tutor would be necessary, who would have to be seconded from your own staff. If however the further training or retraining only affects one or a few company workers it will be more worthwhile for those affected to logon to a virtual seminar, for which charges are made according to the number of participants and for which an external contact is available.

Just as is the case with face-to-face seminars, electronic training courses are oriented to the structure of the learning material. This means that knowledge of the functional area in question is transmitted with its basics as the starting point. It should however be modularised so that it can be processed in small units and be serviced by more than one tutor. Furthermore teleconferences and other forms of communication between the participants should be possible, and your specific requirements be met by adapting the material. In order to find a course matching your requirements, however, external advice is needed because of the large number of products with different quality criteria available on the market. Retaining a vocational training consultant is not the only possibility: chambers of commerce and employers' associations would also help you in the search for a suitable product.

This form of further training and retraining too requires normally a high level of media and self-learning competence. However, when making your decision, you can take into consideration various alternatives like for example electronic courses with a more or less

high proportion of face-to-face sessions and a direct feedback between learners and tutors, and also social contacts. The decision criterion in this case should be that this form of learning is accepted by the employee or employees affected.

Real life example:

A small company in the service sector is specialised in building services engineering and power engineering. One employee was required to be responsible for all of the office work. The wife of the company owner, employed earlier in the engineer's department of a local authority, decided to take over this task in the joint family company, and to become qualified as a commercial clerk via retraining measures. As it was simply not possible for her to take part twice a week in face-to-face seminars over a period of 18 months, she decided for an online course that had several advantages, above all flexibility with regard to the times she was "logged on". She could access the course material with the standard web browser Internet Explorer: no other software was necessary.

Learning goals type 4: skills and the capacity to act in a secluded room – practical tools

This form of vocational training is suitable when company workers, with their current working methods as a starting point, wish to extend their existing knowledge pragmatically and practise new routines. With **practice tools**, work situations can be simulated and various solutions tried out under guidance in a "secluded room" without any mistakes leading to unfavourable consequences. Suitable fields of application are for example preparing for examinations during apprenticeships, training with application software, or the simulation of work situations in which practical skills can be tried out.

Real life example:

In this case, the famous flight simulator will not be cited although this well-known example shows extremely well what complex tools are capable of. Instead, as preparation for international business transactions, an English language online practice tool "business skills" is presented of which the aim is to work successfully in an international environment. In this case it is extremely important to be able to present both one's company and oneself confidently and effectively in English. This tool helps to prepare the participant for English

language situations or tasks like for example telephone calls, meetings, presentations, negotiations or business correspondence.

Learning goals type 5: help with creative problem solving processes – discussions forums

Before the Internet came to be used in almost all companies it was accepted that internal communication regarding problems specific to various company functions took place via more or less formal meetings, by post or telephone. **"Virtual communities"**, i.e. virtual **discussion forums** and **platforms for exchanging ideas** and information provide nowadays the chance of eliminating gaps in knowledge with up-to-date information and of discussing specific problems arising in work situations. This can take place internally via an Intranet but also via the internet. Which one you choose will depend upon the nature of the question to be asked, whether it is of general interest and hence would trigger off numerous replies. In this way internal communication can take place at different locations all at the same time. The condition for achieving this is an appropriate computer workplace with Internet access for each employee concerned and also the corresponding media competence.

Forums are particularly valuable for creative problem solving processes because, as a result of the high degree of – generally desired – anonymity achieved, unconventional solutions are often suggested – solutions which would never have occurred to you or your colleagues. It should however be said that in practice anonymity of the users is not an essential characteristic of discussion forums.

Strictly speaking, discussion forums are not learning software – they take place independently of the use of e-learning learning programmes and without being led by tutors. However they are an extension of programmes of this type and make an important contribution to *informal learning* and internal communication within the company.

Real life example:

A medium-sized design engineering company in the automotive sector needed to ensure that knowledge specific to motorised vehicles was disseminated at the company level. The company officer responsible went a step further: he/she set up an Internet forum in which experts from various companies could exchange information on the topic of lightweight construction and vehicle body design. Documents and remarks can be entered on the forum, and these can then be accessed and (in some cases) downloaded. In this way a tool has emerged that disseminates and shares globally knowledge related to the automotive sector, and above all optimises time-consuming search processes.

Learning goals type 6: structuring creative processes through production instruments

The so-called *production instruments* can support and structure creative processes. Above all the use of video cameras can be used for this, as they can support the user's analysis of his own actions in training and on-going training processes – in particular those directly connected with his working habits – by playing back video recordings of them. Normally, however, their use is restricted to face-to-face seminars. Producing learning videos for integration in e-learning programmes is relatively time-consuming and is therefore not usually is a viable alternative for medium-sized companies.

Learning type: informal learning

In the learning goals type 5 an example has already been given for informal learning at the workplace that is not necessarily related to discussion forums or is organised by the company's where one is employed but also uses forums organised in other locations for dealing with current problems. Unrestricted research at the workplace is becoming more and more important as an information source for current learning requirements. This form of learning requires from the employee a high degree of self-learning competence, determination and a good sense of orientation. Apart from setting up appropriate workplaces the acceptance and promotion of informal forms of learning should be almost second nature to the company. Self-learning competence can, for example, itself be part of the learning material, and simple evaluation instruments can be provided. Company-wide support of an informal learning culture can definitely reduce the extent of use of

many learning programmes and in this way reduce costs, and some learning programmes could be dropped altogether. In total this would promote within the company a culture of learning on one's own responsibility.

Which technical quality standards and possibilities of adaptation for informal learning would be adequate for the electronic media installed in your company is a matter for you to define along with your IT officer and the external vocational training consultant. We shall not go into it here.

3.4. Production

After completing the process of product development, in which you and your staff were involved, the prototypes developed for on-going training or retraining of selected representative employees will be tested in this new phase. To what extent and in what detail this happens will, of course, depend upon how comprehensive, demanding and complex the installed programmes are. If, for example, you have installed electronic training courses that have been proven in practice many times and of which the learning goals and content were previously agreed in detail with the learners, then a simple check that they "run" smoothly and that the learner can easily logon will be sufficient, and the programme can be used. If, on the other hand, a complex prototype very much tailored to the company's requirements has been installed, then in this phase it will be reviewed whether the learning media and installed infrastructure ensure that the training aims and user requirements will be met in view of the basic conditions of the company. If necessary, adjustments will be made and tested in feedback loops.

3.5. Implementation

Only when the last feedback loop has shown that the training programme functions as intended by all involved in the conception phase, will it be released for *use by all learners involved*. However, even in this phase it can still happen that one learner or another feels

that his expectations have not been met. Criticism of this type should be taken seriously, and action should be taken, for example in the form of individual support or changes in the learning arrangements.

The inclusion of learners and others involved does not come to an end with the implementation and release of the learning programme. Within the course of the further training or retraining, problems can still arise of an individual, technical or organisational nature. But of course you know that in these cases there will be problems unless you take account of the experience and suggestions of your staff.

3.6. Evaluation

Work-supported vocational training is implemented for reasons of cost and quality. Hence the question now arises whether all the effort has been worthwhile. Have the expected overall cost savings been achieved when compared to hundred percent face-to-face learning? Do the quality control procedures embedded in the product development and installation process genuinely ensure that the users of the programmes make use of their learning potential and hence apply them? Especially for a medium-sized company it is particularly difficult to find measurement data that for example applies to changed user behaviour. Furthermore, a company's success, i.e. a measurable added value, can only be shown in a few cases to result from investments in vocational training. This is simpler in the case, for example, when numerous customer complaints can be shown to arise from defective know-how of the service technicians when maintaining new equipment. It after appropriate training the number of complaints sinks significantly it is possible to show the value of the training in money terms. Demonstrating the connection of positive effects to on-going training and retraining, whether it be in the form of e-learning or as face-to-face learning, is however, in complex relationships, not possible – at least not without considerable analysis costs. So we are left more or less with a comparison of all the measurable costs on one hand and, on the other hand, your subjective judgement of the added-value arising from multimedia access to the know-how of your company and the World Wide Web.

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