Career Development through E-Learning: The Importance of a Competence-Based Learning Approach

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Abstract

This paper stresses the need for a competence-based learning approach when it comes to career development with e-learning. When the goal of e-learning is to train people for the sake of their careers, one should not see these people as students who receive education (as we do in traditional learning approaches) but as employees who have to be prepared to perform. Of great importance here is the transfer of training. What is learned has to be transferred to the (future) workplace. For that reason, the competence-based learning approach is introduced. Competencies with associated tasks and practical or problem situations provide the basis for a curriculum, in our case, an e-learning curriculum. After further elaboration of this idea, we have emerged with a number of recommendations for the implementation of digital training materials.

Abstrak

Artikel ini menekankan keperluan terhadap pendekatan pembelajaran berasaskan kemahiran dalam e-pembelajaran dalam pembangunan kerjaya. Apabila matlamat e-pembelajaran adalah untuk melatih orang ramai untuk tujuan kerjaya, seseorang tidak sepatutnya melihat mereka ini sebagai pelajar yang menerima pendidikan (seperti yang dilakukan di dalam pendekatan pembelajaran tradisional) tetapi sebagai seorang pekerja yang perlu bersedia untuk bekerja. Hal yang amat penting di sini ialah pemindahan latihan. Apa yang dipelajari perlu dipindahkan kepada tempat kerja (akan datang). Atas alasan tersebut pendekatan pembelajaran berasaskan kemahiran diperkenalkan. Kemahiran yang berkaitan dengan kerja dan praktik atau situasi bermasalah menyediakan asas kepada sesuatu kurikulum, dalam kes ini ialah kurikulum e-pembelajaran. Selepas perbincangan idea ini kita telah mengetengahkan beberapa cadangan untuk pelaksanaan bahan latihan digital.

Introduction

In today's society, a lifelong learning attitude is important for employees at the workplace. In education and training, we see many students who are learning for the sake of their work, e.g., either to improve their careers, or even to make sure that they keep their jobs. Their training programme does not often begin at the same starting point. The curriculum is too often based on elementary, broad and general issues which have survived over the years and remained in the curriculum without any real reason. In this article, we make a case for the more focused starting point of career development and an emphasis on competences.

Career development is seen as a formalised career planning activity to develop employees who are ready for movement to different jobs, to reduce absenteeism and turnover, to cultivate the realisation of individual potential, to motivate employees to establish their own career objectives and act on them, to increase the management awareness of available talent within the organisation or for the organisational preparation of long-term trends that might pose opportunities or threats (Rothwell & Kazanas, 2003).

Career development is rarely adequate by itself to ensure promotion. In the end, it all adds up to the adequate performance of an employee. When adequate performance is of main importance, educators should focus more on the "transfer of training" not only for the sake of businesses but also for the benefit of the employees involved. Employees spend their time and effort on career programmes and training. For these reasons, educators are obliged to come up with effective and efficient solutions. One possible suggestion is the use of competence-based training.

Competence-based training is understood as "training that focuses on the acquisition of particular competencies in a person so that this person is able to act professionally in particular problem and/or vocational situations". A competence is a cluster of skills, attitudes and underlying elements of knowledge which enables a person to carry out those tasks which constitute an important part of a function or role (Parry, 1996). ICT can be deployed as a primary platform ensuring a definite (virtual) context and/or it can be used as a supporting aid to resolve a problem or vocational situation.

In this article, a description of a number of crucial aspects is provided. An attempt has been made not to become lost in definitions and subtle differentiations (Tarrant, 2000) which in our view excessively dominate the field of training.

Competence-Based Training

The field of training has the task of supplying competent employees who can be immediately productive to a rapidly changing society. Competencebased training is seen as the way in which to respond appropriately to the wishes of business and industry, among others, and to prepare learners for the role they will play in their working life and in society. Support for competence-based training is growing. Since the mid-nineties, there has been a plethora of articles on competences. Almost every author adopts his/her own definition or subtle distinction (Stoof et al., 2002). Unfortunately on the practical side, there has been no clear definition of the term to date (Schlusmans et al., 1999).

Research by Stoof et al. (2002) shows that the confusion over the term "competence" does not only make theorising more complicated but also poses problems in practical educational and training innovations. Too much time is spent on differences of opinion on its details, and it is often found during implementation that an injudicious use of the term as an underpinning to innovation leads to results which in essence differ little from more traditional approaches. It would be more rewarding to understand competence-based training as an approach allowing us to look critically at these more traditional forms of training. Such a comparison with the old situation is therefore often a better basis from which to start. The table of differences between traditional training and competence-based training (Jochems & Schlusmans, 1999) shown in Table 1 provides a firm foundation on which to proceed.

It is often found during implementation that an injudicious use of the term as an underpinning to innovation leads to results which in essence differ little from more – as we shall call them – "traditional" approaches. It would be more rewarding to understand competence-based training as an approach allowing us to look critically at these more traditional forms of training. To make things clear, one can make a comparison based on a "pure" or idealistic description of the "old" and the "new" or desired situation. Such a comparison with the old situation is therefore often a better basis from which to start. The table of differences between traditional education and training and competence-based training (Jochems & Schlusmans, 1999) below provides a firm foundation on which to proceed.

E-Learning and Competences

Although more traditional approaches can also provide valuable learning experiences, they are not explored in depth here. We also do not elaborate on the symbiotic relationship between instructor-led and technology-based training, often called blended learning (Holton et al., 2006), but focus, in general, on technological possibilities and especially on curriculum interventions. The characteristic features of competence-based training as expressed in Table 1 (Jochems & Schlusmans, 1999) can all be supported by ICT to a greater or lesser degree (Bastiaens et al., 2002a; 2002b).

Table 1	Traditional versus competence-based training
	(Jochems & Schlusmans, 1999)

Traditional Training	Competence-based Training
The curriculum is based on	The curriculum is based on competences displayed
knowledge contents and discipline-	in accomplishing tasks and dealing with practical
oriented skills	or problem situations
Learners study pre-determined	Learners carry out learning tasks, either with or
contents	without other learners
All learners go through more or less	A made-to-measure curriculum is put together
the same curriculum	depending on the entry level
Knowledge and skills are tested	Mainly testing of competences
Trainer or teacher-controlled testing	Also self-assessment and peer assessment
Separate skills modules	General skills are integrated into learning tasks
Training units are derived from	Training units to a significant degree are
separate disciplines	interdisciplinary

The Curriculum is Based on Competences Displayed in Accomplishing Tasks and Dealing with Practical or Problem Situations

In competence-based training, the emphasis is on the tasks which a person must be able to carry out and on the problem and practical situations in which he/she must be able to act competently. The construction of the curriculum, the selection of the training material and the testing of learners are based on these two principles. The emphasis is not on the development of knowledge alone but on learning a complex combination of knowledge, skills and problem solving (Gulikers et al., 2002; 2005).

A distinction can be made here in ICT support. First, ICT can be deployed as a primary medium where the ICT creates the (virtual) context or problem situation for the demonstration of the competence. Software is developed and simulates more or less a reality (Stijnen, 2003). In addition, ICT can be deployed as an aid to competence-based training. All kinds of content environments, auxiliary systems and information and search tools can be consulted in carrying out or acquiring the competence. Figure 1 shows an example of software, developed at the Fernuniversität in Hagen, in which learners can learn from a practical problem situation (a video). Around that problem situation, different tools and content can be consulted.



Figure 1 A screen capture of an e-learning environment (ICT as a primary medium)

Another good example of this is a Virtual Enterprise (Westera et al., 2000). A Virtual Enterprise is a very explicit and clear elaboration of competence-based training. In practice, this means that a virtual environment is created within which a small group of learners can take part and work. They are guided by a coach. It is a networked enterprise,

without a physical location, building, offices or meeting rooms. But it does exist, virtually with, for example, its own website on the internet, computer workstations and computer conferences. The learning tasks are viewed in the electronic environment as genuine tasks.

In the Virtual Enterprise, we distinguish different (learner) roles such as the director, the treasurer, the secretary and so on. In the enterprise, learners are viewed as employees who learn while working on assignments. We call this "enterprising learning". This term fits in well with what some authors describe as the "new learning". The Virtual Enterprise is intended to allow learning and working to be associated as closely as possible. In this enterprise, employees can, to a great extent, decide for themselves at what time, how often and at what pace they study. In addition, applying what has been learned immediately to practical projects motivates them, so that a sense of a corporate culture is already acquired during the period of training.

Learners Carry Out Learning Tasks, Either With or Without Other Learners

The learning task is at the core of competence-based training. Learners are confronted with problems and assignments in a learning task. The aim is for learners themselves to acquire knowledge, skills and attitudes, enabling them to solve problems and save themselves from any difficult situation. They then discover for themselves what knowledge and skills they do not yet possess and are helped and guided to acquire this knowledge and these skills independently. This active approach to learning is unfamiliar to many learners, and learning tasks have therefore been oriented in such a way that they gradually learn how to manage their own learning process and learn independently. Learners will also have to carry out a number of learning tasks with other learners and learn how to collaborate together.

ICT is commonly used, in particular, in working on learning tasks together with other learners (Van Merriënboer et al., 2004). Computer-aided collaboration in the form of chat-room and e-mail facilities is very popular. ICT serves here as a secondary medium (as add-on to a learning environment). Good examples of this are the projects of Stassen et al. (2002), in which learners learn by collaborating to comment on each others' writings in a digital writing environment, and of Van Eijl et al. (2002), in which learners are offered classes, assignments and electronic quizzes. One of the most significant advantages in working on tasks together with other learners of a same organisation, is that changes or innovations get a greater chance to be realised because all members have participated in the training.

A Made-to-Measure Curriculum is Put Together, Depending on the Entry Level

The underlying principle in competence-based training is that learners only have to learn what they cannot do or cannot do adequately as yet it can be determined by the learners taking a pre-examination on what competences or what components of these competences they have already mastered. Only those learning tasks which relate to the components still missing are then offered. In this way, the learner is offered learning tasks which are tailored to his/her needs.

The flexibility of ICT is put to use. Electronic Learning Environments (ELEs), in particular, are highly regarded for the flexible (often individual) learning routes they make possible. An ELE is often a web-based study centre accessible through the internet. Each learner has his/her own virtual study location where he/she can access previously selected contents and can communicate with fellow learners or with the trainer.

Mainly Testing of Competences, also Self-Assessment and Peer Assessment

Whatever a training medium or a training organisation does, it is the learner who ultimately determines whether he/she learns a great amount or a little. In competence-based training, the learner will be emphatically addressed on this point. The learner is confronted with explicit assessments of his/her attitude and skills in relation to the requirements of the occupational field for which he/she wishes to be trained. The learner is familiarised with forms of self-testing and group evaluations and learns to reflect on his/her learning and work experiences. At the same time, vocational practice requires that the learner is able to quickly acquire new knowledge and skills at the right time independently, and also able to reflect on his/her own actions. Competence-based training necessitates different forms of testing (Gulikers et al., 2004), not just testing of facts but testing of competences attained. When we ask learners to work together more and to develop a higher order of skills, the testing cannot remain unadapted. If we, for example, only test at a level of actual knowledge, learners will quickly adapt their behaviour to that level and, for example, neglect aspects of collaboration which "do not really count". One of the commonly used forms of testing is self-assessment, where the learner assesses himself/herself, or peer assessment are commonly linked to portfolios. In portfolios, which originate from the teaching of art, learners put together evidence demonstrating that they have mastered a particular competence. Gunnewiek et al. (2002) give an example of a "workshop portfolio" in training in German, which illustrates the learner's development (of language skills) and his/her reflections on it.

Although forms of assessments like portfolios and self-assessment are very promising, a great amount of work has to be done concerning their validity and reliability (Baartman et al., 2006).

General Skills are Integrated into Learning Tasks and Training Units are to a Significant Degree Interdisciplinary

Currently, every curriculum has subjects such as "communication" and "working in projects". The learners have to be able of adapting their skills adequately in very different situations. They should therefore also be trained and tested for this in widely different contexts. It should be possible for such skills and associated tasks to be incorporated in the subjects in a competence-based curriculum. Learning tasks in which learners are confronted with realistic situations represent the angle adopted for a competence-based curriculum.

The form of the learning tasks can vary, for example, a realistic game, a simulation of a practical situation, a project assignment, a practical orientation or a practical placement. By themselves, true-to-life problem situations can usually break through the persistent subject structure which often prevails in training courses. Competence-based training is thus, by definition, interdisciplinary and far less bound by domains. An example of a project for this is that of Mulder & Swaak (2002), which studies

multidisciplinary projects in which multidisciplinary teams try to develop a common conceptual framework.

The interdisciplinary nature of competence-based training is greatly stimulated by the use of ICT information sources such as the internet. Searching for information using web quests is very much in vogue. A web quest activity is concerned with the collection (in a group setting) of information via the internet (see, for example, http://webquest.sdsu.edu/ webquest.html). Sources are consulted in order to solve a problem as thoroughly as possible. The problems presented to learners must have a loose structure and permit open study. The learning must touch on a range of topics and subjects. In training, two forms of web quests can be distinguished: short-term web quests and long-term web quests.

A short-term web quest is principally focused on information acquisition and integration. At the end, learners have grappled with large quantities of information and are aware of this information. A long-term web quest is focused on the broadening and refining of knowledge. At the end, learners have analysed a field of knowledge, have transformed it into some form and demonstrated their learning by creating something in the area of knowledge to which others can respond.

An important aspect of the didactics of a web quest is built-in guidance components (Martens, 1998). Competence-based training, as can often be seen in web quests, is moving more in the direction of independent learning or even distance training. This necessitates a completely different approach by the training provider. A distinction is made, where necessary, between basic material and aids which make possible the independent study of the basic material. Examples which can be mentioned are diagrams, self-testing questions, summaries and study instructions.

Authenticity

In competence-based training, learners are no longer primarily trained to pass their examinations but to learn independently and to manage their own learning process. Training on the basis of authentic tasks is an essential feature. When learners are confronted with real and meaningful learning tasks, the learning becomes more meaningful and interesting for them. The most significant feature of an authentic learning task is that this must deliver a learning experience closely related to reality. Herrington & Oliver (2000) have formulated a number of conditions to be met by authentic learning tasks. See Table 2.

Table 2 Conditions to be met by authentic learning tasks

- They must provide an authentic context, which reflects the skills necessary in real life.
- The learning tasks must encourage authentic activities characterised by relevance to reality.
- Authentic learning tasks must make possible access to expert performance.
- Authentic tasks must make it possible to look at a situation from several perspectives and where appropriate, fulfil several roles.
- Authentic learning tasks must encourage the common build-up of knowledge.
- The authentic learning tasks must stimulate reflection.
- Authentic learning tasks must encourage the articulation of implicit knowledge so that the learners are prompted to make all their knowledge explicit.
- Coaching and guidance must be offered at critical moments.
- Authentic testing must be built into the learning tasks.

Technological applications can again support working on authentic learning tasks. Using ICT, "real" environments can be created in which learners can work on attaining their competence and can carry out tasks as "real employees", can explore new fields, meet different people and can use varied methods and instruments for the gathering of information and solving of problems (Gulikers et al., 2002).

As a result of the much-promised added value of authentic learning combined with ICT, the Open University of the Netherlands has for a number of years been developing what it calls "confrontations with practice", that is to say, electronic cases in which the entire context in which a competence must be learned is simulated.

Field Work

A study on possible stress factors was conducted among bus drivers. A psychology learner is put in the role of junior adviser at a (virtual) consultancy firm. The learner carries out an extensive study at a large bus enterprise, which is having to contend with a high rate of sick leave. A senior adviser at the consultancy firm acts as mentor for questions, advice

and guidance. All materials, such as newspaper articles, photographic reports and interviews, are authentic. See Figure 2.



Figure 2 An example of a simulated environment

Legal Argumentation

In this programme, the law learner is given a method for the optimum presentation of a legal argument in court. This learner is on placement with a (virtual) law firm. One of the office staff acts as a guide. The learner is to prepare a legal argument for a number of sessions on the basis of the associated dossiers. At a concluding seminar, the learners come together and hold their prepared speeches. This programme is concerned with court cases which have happened in reality. The sources worked with are authentic.

Conclusions and Recommendations

As indicated, the significance of flexible life-long learning is increasing sharply in the new knowledge-based economy. This necessitates training tying in with the learners' own learning needs as closely as possible. In addition, the new generations of learners, who grow up with the internet and mobile communication, also expect the intensive use of ICT in training. This flexible, adapted training – with a large amount of ICT – makes specific demands on the development of learning environments. Developments in the area of ICT have a great impact on the organisation of learning and of learning environments. The internet and large databases with increasingly more advanced search engines make it possible to open up large amounts of information to learners. At the same time, all this leads to learners being overwhelmed by constantly changing and ever more quickly, obsolescent information.

New means of communication, such as e-mail, discussion groups, audio conferences and video conferences, chat-rooms and mobile phones, offer opportunities for communicating with learners independently of place and time.

In addition, more and more development environments are being designed which make it possible to personalise electronic training materials and tailor them to the needs of the learners. These new technologies create ways of responding to the changed learning needs and the new views of what constitutes good training. Initiatives in this area can therefore be seen in many educational and training institutions (Lubberman & Klein, 2002). They nevertheless do not often lead to desired results (also see Van Gennip & Braam, 2002; Stijnen, 2003a, 2003b; Smits et al., 2006). Software packages are purchased without being given much thought, lecturers put course information, power point presentations and supplementary texts on the internet and/or top up classical training, for example, with e-mail facilities. In many cases, this leads to a large amount of text, which can only be possible to browse through; there are few opportunities for interaction or there is no feedback on what learners think they have learned. Frequently, many new digital training materials are also not developed in line with new educational/didactic findings and are commonly limited to just a virtual transfer of knowledge.

On the basis of this experience, we have formulated some basic principles and recommendations (also see Salomon, 1998; Bastiaens et al., 2002) which will be discussed below.

Learning is an Active Process of Building Up Knowledge

Learners build up knowledge, and do so in an active way by comparing, refining and expanding the knowledge they already possess. This can only be done if learners are activated, for example, by presenting learning tasks which can be carried out individually or in a group.

Electronic environments can offer support: various sources are offered, together with, and at the same time as electronic aids to make these sources accessible. These may be search engines, references to explanations or to other sources.

Learning is Experimenting

Learning arises from the experiences acquired during experimentation with reality. Electronic learning environments can function as a cognitive aid during such experiments. They can support learners in the experimentation process by taking away part of the cognitive burden, for example, through the use of calculating programmes, simulations or games. To prompt learners to adopt this explorative behaviour, it is desirable to make the environment and the problems so interesting and challenging that they are intrinsically motivating.

Learning is Best Done in Authentic Situations

Learners are motivated by realistic examples, but most learning is best done through real or authentic situations. Practical assignments and varied forms of work will be of importance. Electronic learning environments may play a role, for instance, through the creation of authentic situations, as a substitute for the real environment. It is sometimes difficult to confront learners with authentic problems. These problem situations can nevertheless be presented to learners by using a virtual environment. Learners can also be put in contact electronically with experts or with fellow learners and lecturers.

Learning is a Social Process

Collaboration, communication and feedback are crucial to the learning process. Although face-to-face education still plays a leading role in the social aspect of learning, technical developments in relation to communication technology still offer ways of also putting communication into effect remotely, both synchronously and asynchronously. The role of distance training is becoming ever more significant. Forms of collaboration in a virtual community can also be imitated in electronic environments.

Learning Continues to Build on Knowledge Already Present

Learning is best done when new information is linked to knowledge already present. However, the build-up of this knowledge progresses differently for each learner depending on his/her previous experiences. Made-to-measure training and adaptation of the learning environment to the level of the learner and to individual preferences are therefore necessary to optimise the learning process. Electronic environments are ideally suited for offering materials matched to individual needs and prior knowledge. It is relatively simple to re-use electronic training materials so that different versions can be created for different target groups.

Learning is the Business of the Learner

Responsibility for the learning process ultimately rests with the learner himself/herself. Opportunities must be offered to the learner to steer this learning process. In traditional face-to-face training, this steering is principally done by the trainer who usually operates classically, has often planned fixed assessments and works with syllabuses. This planning will be more flexible in an electronic environment. An adult learner can then manage the training by himself/herself to a greater degree, has all the materials at his/her disposal and can decide for himself/herself what is taught. Even for collaboration with others, a learner is not tied to fixed times. The communication can also proceed asynchronously through other e-mail and news groups.

Finally, the learners should be given the opportunity to test (themselves) and obtain feedback. Many testing schedules can be built into an

electronic environment, including tests of prior knowledge and progress tests. Learners can adjust their learning process, if required, on the basis of rapid feedback.

ICT for Delivery and Support for the Learner

Evolution analogous to views on learning can be recognised in the use of ICT in educational development. The learning material in training must increasingly be geared towards the individual learner and be capable of being quickly updated. "Made-to-measure composition" must, in fact, be possible. A shift can be seen in this connection from a "craft-based" to a "business" approach. Looking at the use of ICT in training in general, three forms can be broadly distinguished (Kirschner et al., 1995).

The first form, which for a long time has been dominant (and still is so) is the application of ICT to replace educational equipment used previously, usually at the training level and on the initiative of a trainer. The nature or structure of the training remains essentially the same. For example, a power point presentation is given instead of writing on a blackboard or a text on the internet is accessed instead of using a book. The development of training in this form can be termed as "craft-based". Almost all the components of the training are in the hands of one person: the trainer. He/she is responsible for the content of a subject, is allocated a group of learners, a particular amount of time and resources and then chooses his/her approach independently. The trainer sets the tests, guides and corrects learners and finally to a significant degree, evaluates his/her own training.

In a second form of application of ICT, which is innovation, attention shifts from technology to didactics; the aim of the training does not change, but in terms of structure, execution and organisation, it takes on a different look. This usually relates to ICT applications which relate to the complete form of training, for example, the introduction of a computer simulation.

In the third form, which is transformation, the use of ICT is focused on a more fundamental re-consideration and re-design of the basic principles and organisation of the whole training. For example, from the knowledge transfer method to a more competence-based or problem-driven method. It is not just the curriculum that is affected, but the entire orientation of the educational organisation. Many training institutions adopt the first form - ICT as a replacement for a particular aid in previously developed training material - but pushing the level of ambition more in the direction of innovation.

ICT in Support of the Training Provider

Educational development and the development of digital training materials in the "craft-based" manner referred to above cannot be sustained in innovation and transformation if the trainer has to tailor his/her training (both in terms of content and didactically) to individual learners or if that training has to be delivered to learners at different times and places and through different media. It becomes completely unfeasible if the demands and lifestyles of individual learners have to be followed, or if the training has to be preserved, for example, using training materials from a colleague to create new training materials which can be used for a different target group.

Digital training materials offer many opportunities to make the training flexible, interactively multi-media and personal. In addition, they must be attractive, motivating and efficient. Learners must be able to learn actively and trainers must be able to use the training materials in such a way that their workload does not increase substantially because they have to approach each learner individually. It is also often demanded that it must be possible for the training materials to be used on various learning management systems and that the materials must be easy to update and make topical. A direct link between the developed training and the administrative and learner monitoring systems is often also desirable.

The training materials must satisfy a number of technical requirements to be able to meet all these expectations. The most significant of these relate to the way in which the materials are described and stored. For it to be possible for the materials to be delivered to various systems and be made re-usable, it is necessary to standardise the file formats the materials are stored in and to make use of a specific modelling language.

ICT can also be used as a tool for educational designers. Research shows, however, that many tools for lecturers and designers are oriented towards

just one phase of educational design, namely, actual delivery (Van Merriënboer & Martens, in press). An example might be an HTML editor for web-based training. As a result, there is too much emphasis on technology and not enough on didactics. What is possible technically dictates what happens and not didactic desirability. Tools which also support the other phases of the ADDIE model (analysis, design, development or production, implementation and evaluation) of Gustafson & Branch (1997) are therefore a highly desirable future development.

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