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Pour une caractérisation des modes de déploiement des parcours e-learning

For a characterization of the modes of deployment of e-learning courses

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Résumé

Ce texte sur la caractérisation des modes de déploiement des parcours e-learning fait suite à notre revue de littérature sur le e-learning que nous avons utilisée dans notre travail doctoral. Le e-learning est défini dans cette recherche comme un ensemble de modalités multimédias de formation en ligne visant des apprentissages spécifiques. Les pratiques de déploiement des parcours e-learning auprès des salariés évoluent depuis plusieurs années. L'évolution de ces pratiques vise à améliorer le taux de suivi par les salariés des contenus de formation diffusés en e-learning ainsi que leurs apprentissages. Il existe un intérêt académique et managérial à mieux comprendre les facteurs influant sur l'acte de suivi de parcours e-learning par les salariés ainsi que sur les apprentissages des salariés éventuellement consécutifs à ce suivi. Sur la base de ces constats, il ressort l'importance de proposer une caractérisation des modes de déploiement des parcours e-learning auprès des salariés. Trois dimensions principales du déploiement du e-learning en entreprise ont été identifiées et seront présentées dans cet article : la dimension technologique, pédagogique et organisationnelle.

Mots clés : modes de déploiement, e-learning, e-learning courses

Abstract

This text on the characterization of the modes of deployment of e-learning paths follows our literature review on e-learning that we used in our doctoral work. E-learning is defined in this research as a set of multimedia online training methods aimed at specific learning. Practices for deploying e-learning courses to employees have been evolving for several years. The evolution of these practices aims to improve the rate of follow-up by employees of the training content distributed in e-learning as well as their learning. There is an academic and managerial interest in better understanding the factors influencing the act of monitoring e-learning courses by employees as well as on the learning of employees possibly resulting from this monitoring. On the basis of these observations, it is important to propose a characterization of the modes of deployment of e-learning paths among employees. Three main dimensions of the deployment of e-learning in companies have been identified and will be presented in this article: the technological, pedagogical and organizational dimension.

Keywords : modes of deployment, e-learning, e-learning courses.

Introduction

The same e-learning course can be deployed in different ways to employees of the same company (Bernardin, 2006). For example, an e-learning course on Excel can be offered to employees as the sole means of training or as a complement to face-to-face training sessions, i.e., directed and attended by an instructor in a dedicated space.

The different ways of deploying the same e-learning course can place employees in different training environments. They can have an impact on employee reaction. For example, Bernardin (2006) has demonstrated the influence of differences in e-learning environments on employee satisfaction and learning. Thus, employees who e-learning multimedia self-training modules on office automation in training centers are more satisfied and training centers are more satisfied and have higher multiple-choice scores than those who take multiple choice questionnaires than those who take them at their workstations.

From this observation, it is important to be able to characterize the deployment modes of the e-learning courses presented in this article. The term deployment is defined in the Petit Larousse (2005) as "the action of deploying" or "the fact of being deployed". The first definition indicates the dynamic nature of deployment and the steps followed to deploy. The second notion emphasizes the result of this action and the state of what has been deployed. It is the second second acceptance of this notion which is retained in the continuation of this work. The challenge is to try to The challenge is to try to qualify the elements external to the employees that are likely to characterize the e-learning environment e-learning environment in which they are located. Several researchers have attempted to describe the different dimensions of e-learning deployment in companies. The majority focused on one or two most of them were interested in one or two particular dimensions. In our view, Welle-Strand and Thune (2003) offer the most comprehensive view. Indeed, these two authors identify three main dimensions of dimensions of e-learning deployment in companies: the technological, pedagogical and organizational and organizational dimensions. In these terms, they describe the challenge of implementing e-learning in companies and its link with the the challenge of elearning in corporations is to facilitate learning in a manner that technology, pedagogy and organization are related and create a coherent and organization are related and create a coherent, manageable and logical system for learning activities" (Welle-Strand, Thune, 2003, p.187). The identification of these three dimensions has the particularity of being the result of the analysis of an e-learning system of a large Swedish telecommunication group. In our opinion, their approach has one limitation: the lack of precision in the description of these

three dimensions. The work conducted in other organizations will therefore be integrated to describe and analyze these different dimensions.

The objective of this article is to characterize the three dimensions of the deployment of an e-learning course: the technological dimension, the pedagogical dimension and the organizational dimension.

1. Technological dimension: proposed definition and analysis of attributes

Technology is the cornerstone of e-learning (Martin et al., 2003; Mitchell, Honore, 2007; Mueller, Strohmeier, 2010; Newton et al. 2002; Wild et al. 2002). According to Mottay (2005), it is even an important factor in its success. The use of technology involves the The use of technology implies the realization of multimedia content and the access of end-users to this content (Lau, 2003). For Sambrook (2001, 2003), one of the first difficulties companies face in integrating of e-learning is the implementation of the technological device. Dagada et al (2004), in a research conducted with SMEs and SMIs, explain that the insufficiencies in technological infrastructure is the first obstacle to the deployment of this set of e-learning modalities in training modalities in companies. Marchand and Lauzon (2004, p. 64), citing (Loisier et al., 2003), add that "it is easy to understand that the lack of an adequate technological infrastructure and resources required for the development of e-learning can be seen as a major limitation. can be seen as an important limitation to the benefits of e-learning.

In France, a study conducted by Préau in 2008 revealed that 7% of the companies that responded to the questionnaire stated that they did not integrate e-learning into their training system because of the weakness of their IT equipment. According to Ettinger et al. (2006), a poor selection of technologies can even handicap the further development of e-learning in training in companies.

The consequences of the technological device on the user are multiple. Problems of access (Packham et al., 2004; Stewart, 2002), feelings of anxiety, feelings of frustration (Cantoni et al., 2004), satisfaction and learning (Bernardin 2006, 2007) are some of the examples. One of the challenges of implementing e-learning pathways is to "avoid individual problems" (Comacchio, 2004).

According to Welle-Strand and Thune (2003), the technological dimension qualifies the technological infrastructure (hardware and software) implemented by a company to enable its employees to access e-learning content. An analysis of the research that has addressed this topic reveals two central components of the technological infrastructure: the e-learning platform (Favier, 2003) and the computer equipment consisting of the network (Henry, 2001;

Lau, 2003; Young, 2001) and the computers (Bernardin, 2006). The following two sections These two components are described in more detail in the following two sections.

1.1. E-learning platform: definition, functionalities and characteristics

The central objective of an e-learning platform is to manage interactions between learners, multimedia content and courses (Bostrom, 2003; Duan et al., 2006; Rosenberg, 2001; Vovides et al., 2007). Morrison (2003, p. 78) defines a platform as "a web-based software application, including a suite of tools, that centralizes and automates aspects of the learning process. Several functionalities are associated with it. Jones and Gregor (2004) define four main categories to list the potential functionalities of a platform:

- e-learning administration, which covers the management of multimedia content, learners and instructors;
- information distribution, which represents all the data flows between the platform, its users and the other software of a Human Resources Information System (HRIS);
- communication, which covers all the communication tools, synchronous and/or asynchronous, that can potentially be associated with a platform;
- evaluation, which concerns the possibilities of measuring the learning achieved by employees, but also the assessment of costs and visibility on the use of e-learning modules.

Some communication tools are attached to e-learning platforms. They allow learners to learners to communicate with each other and/or trainers to communicate with one or more learners. They are not systematically activated or available on all platforms. A distinction is generally made between synchronous and asynchronous forms. A synchronous communication between two people is a communication that takes place in real time. in real time. In contrast, asynchronous communication takes place in delayed time.

Studies on e-learning platforms have mainly been conducted in higher education. Few have been conducted in companies (Bernardin, 2006). Nevertheless, the study of the literature allows us to highlight other criteria likely to specify the characteristics of an e-learning platform. Three criteria can be retained:

- the entity that manages the platform: according to Spanjers et al. (2005), Macpherson et al. (2005) and Morrison (2003), the management of such software can be totally outsourced;

- the software design mode: according to Sims et al. (2004) and Bernardin (2006), platforms can be developed internally, purchased on a turnkey basis or externally and adapted internally internally;
- the nature of the software code: the platform may belong to the world of free or proprietary software (Meissonier, Houze, 2005). One of the fundamental issues related to e-learning platforms is their interconnection and interoperability with the company's other human resources information systems (Dagada, Sesemane, 2004; Henry, 2001; Ismail, 2002). Baujard (2004, p. 112) indicates in another way that "the configuration of the information system influences the process of adopting e-learning by the complementarity This integration is not easy to achieve in the short term, but it is possible to achieve it in the long term. This integration is not easy to implement (Ivergard, Hunt, 2005) at the technical level, but also at the level of This integration is not easy to implement (Ivergard, Hunt, 2005) at the technical level, but also at the level of human resources management processes. Moreover, it has direct repercussions on the creation and monitoring of employees' e-learning paths, as well as the referencing of their acquired skills for and the referencing of their acquired competencies for the follow-up and management of their career.

1.2. Equipment: network and computer stations

If the e-learning platform is the heart of an e-learning system, the network and the the network and the computers are the backbone. More precisely, the type of network and the installation of the hardware and software installation of the computer stations (computers) are important elements to be taken into important elements to take into account in the technological deployment of e-learning (Mioduser et al. 2000; Young, 2001). All these elements will have an impact on the possibility for employees to to access and complete their e-learning course.

For example, some companies are limited in implementing e-learning by the lack of a network with sufficient throughput to support the transmission of multimedia data (Morrison, 2003; Raisinghani et al. 2005). In addition, the speed of this network is not always uniform throughout the company. Some organizations have to install servers for localized hosting in the establishments or subsidiaries concerned. The e-learning platform remains centralized. Standardization of computers and software used by employees is another aspect of this issue. The multimedia applications require a certain amount of computer processing capacity as well

as the software to play the appropriate multimedia files. Without these hardware and software components, users cannot follow their e-learning modules even with a good network.

2. Educational dimension: proposed definition and analysis of attributes

The technological dimension of the deployment of e-learning to employees was defined in the previous subsection. Its components (platform, network and computers) have been explained. The objective of this sub-section is to detail the pedagogical dimension of deployment of e-learning.

According to Govindasamy (2002, p. 287), "One of the most crucial prerequisites for successful implementation of e-Learning is the need for careful consideration of the underlying pedagogy [...]. In practice, however, this is often the most neglected aspect in any effort to implement eLearning. The importance of the pedagogical dimension in the deployment of e-learning courses has been emphasized by several other authors (Lowyck, 2002; Tynjälä, Häkkinen, 2005; Vasquez Bronfman, 2004). For Welle-Strand and Thune (2003), the pedagogical dimension of deployment covers the questions of "who" follows e-learning and what learners follow (i.e., the pedagogical content and activities offered to them). Mayer (2003) states that self-study multimedia modules can be defined by the theme of their content, the types of multimedia activities they offer and their duration. Bernardin (2006) also indicates that the forms of interaction and the forms of control allowed in an e-learning course characterize the pedagogical dimension. With regard to the preceding elements, the following sections present and the following sections present and explain the themes of the e-learning contents (2.1), the forms of interaction (2.2) and the forms of (2.3) developed in the e-learning courses, as well as the possible pedagogical activities (2.4).

2.1. Content themes and audiences

The 2006 Préau study presents the themes on which e-learning content has been purchased or developed by companies in France. Office automation, languages and "computer science for IT specialists" are the most popular content for employees, with 59%, 51% and 41% of companies responding to the questionnaire respectively citing them. These topics are also historically the oldest in French companies. Less significantly, we find "management, sales/negotiation/commercial and to a lesser extent communication/marketing, accounting/management, HRM/trainer training and quality. In a more marginal way production, industrial maintenance, logistics and international trade "(Preau, 2006, p. 3). According to the 2008 Preau study, this trend has been maintained.

Velthouse and Taghaboni-Dutta (2004) looked at e-learning content used by companies in the automotive industry in the United States. Management and personal development ranked first (interpersonal skills, 64%, leadership, 50%, management skills, 50%). Manufacturing process knowledge (36%) and quality (21%) come second with IT skills (21%). Technical knowledge of the company's products is in the minority (7%). In addition, Marchand and Lauzon (2004) have specified and qualified the themes specific to the industrial universe developed in manufacturing companies, particularly automotive companies, according to the classification of Le Boterf (2002). They highlight two main categories: knowledge and know-how. For the first category, they identify theoretical knowledge, environmental knowledge and procedural knowledge. The first sub-category presents employees with the The first subcategory presents employees with the "foundations of the production or transformation process of the enterprise" (Marchand, Lauzon, 2004, p. 61). The content of the second subcategory "relates, for example, to equipment (structure and operation)" (Marchand, Lauzon, 2004, p. 61), as well as processes, components, products and forms of the enterprise. Procedural knowledge corresponds to "rules, methods related to various situations such as the steps involved in using a equipment, the procedure in the event of equipment shutdown, the procedure in the event of equipment breakdown, etc." (Marchand, Lauzon, 2004, p. 62).

Marchand and Lauzon (2004) then highlight formalized know-how, such as "changing equipment parts, from empirical and cognitive know-how, such as the 'analysis and resolution of problems' that may arise on a line" (Marchand, Lauzon, 2004, p. 62). The challenge is to improve employees' cognitive understanding of certain aspects in order to develop their performance during the execution of technical gestures.

To conclude the overview of e-learning themes, it is interesting to note that e-learning content can be e-learning content can be developed internally, externally or purchased from a service provider (Macpherson et al. (Macpherson et al., 2004, Macpherson et al., 2005; Sims et al., 2004; Taran, 2006). In the latter In the latter case, the company buys licenses from a specialized provider (Morrison, 2003): this is often referred to as off-the-shelf content. often referred to as off-the-shelf content.

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In terms of the target audience, Welle-Strand and Thune (2003) indicate that this aspect is defined in the pedagogical dimension of a deployment. Studies on e-learning note a difference in the socio-professional categories to which e-learning is offered. For example, the 2008 Préau study, conducted among 1,742 companies with more than 50 employees, shows that 41.8% of employees who have taken e-learning courses are executives, 24.4% are employees and 23.4% are technicians. Workers represent only 10.4% of the employees involved in e-learning. It is very clear that managers are the first to take part in e-learning, followed by employees and technicians.

2.2. Forms of interaction allowed during the e-learning course

For Zhang et al (2005, p. 23), "interactivity is defined as interaction between learner and learning source and is differentiated from interaction between human interlocutors". It is interesting to note that the terms interaction and interactivity are often used interchangeably in he field of e-learning research (Bernardin, 2006). Anderson's (2004) approach to Anderson's (2004) approach to the different forms of interaction related to e-learning confirms this trend. trend. Interaction is defined more precisely by Wagner, Flannery (1994, p. 237) as "reciprocal events thatrequire at least two objects or two actions. Interactions occur when these objects and events mutually influence one another. Interactions can have an impact on participants' satisfaction and learning outcomes (Fulford, Zhang, 1993, cited by Bernardin 2006). They are an important element to take into account during deployment. deployment.

Anderson (2004) offers, to our knowledge, a complete categorization of the different forms of interaction that can occur in any learning journey.

This categorization takes up previous important works on the subject such as those of Hirumi (2002) or Moore (1989) identified by Bernardin (2006). The six sources of interaction are those between :

- a learner with other learners;
- a learner with an instructor
- a learner with him/herself
- a learner with the content;
- content with content;
- a trainer with other trainers.

The "learner - instructor" and "learner - other learners" forms seem particularly interesting to us. The e-learning project manager can decide whether or not to enrich the e-learning course with synchronous and/or asynchronous exchanges between the learner and other learners

and/or an instructor. In the "learner-trainer" interaction, the employee can call on a tutor to provide additional explanations on a misunderstood element or to provide concrete examples of applications in relation to a concept. The tutor then serves as feedback. The tutor can also be present to define the sequences of a course and regularly remind the learner of the work he/she must do. The "learner - The "learner-learner" interaction can be implemented in different situations.

The training department can first of all design case studies to be carried out in groups. It can also encourage informal exchanges between learners who are following the same course. These two forms of interaction can promote the learning process (Caine, Caine, 1997) through the socio-cognitive conflicts or scaffolding processes that they are likely to foster. The "learner-content" interaction can be defined from the pedagogical activities proposed in an e-learning course. This aspect is explained in the following pages. The other forms of interaction defined by Anderson (2004), described in the previous paragraph, are not, in our opinion, part of the deployment strategy (interaction of the learner with himself) or are not in direct contact with the with the end user (trainer-trainer, content-content interaction). They are nonetheless important in the design of e-learning materials, prior to their deployment.

2.3. Types of control allowed in the e-learning course

"Learner control can be broadly defined as the degree to which a learner can direct his or her own learning process" (Milheim, 1988, cited by Wang, Beasley, 2002, p. 74). E-learning offers greater opportunities for learner control than face-to-face training (Borsook and Higginbotham-Wheat, 1991, cited by Bernardin 2006). It is indeed the trainer who defines and imposes the pace in the case of face-to-face training. The issue of control is important because it can influence the effectiveness of learning. Some studies have been conducted with students in higher education for several years. The use of computers and multimedia in training, more than 20 years ago, is the starting point of this research. However, the results are divergent , Some studies show a positive influence of a high degree of control left to the learners, while others show a negative influence of a low level of control left to the learners (Wang, Beasley, 2002; Yeh and Lehman, 2001). Some studies show a positive influence of high learner control, others a negative influence, and still others find no significant difference. The diversity of control situations, differences in learning style are some explanations. The diversity of control situations and differences in learning style are some explanations for the diversity of these results (Wang, Beasley, 2002; Yeh and Lehman, 2001).

This notion covers different aspects. Wang and Beasley (2002) identify seven of them.

Three are, in their opinion, really important:

- control over the phases of learning (1);
- control over the learning materials (2);
- and control over the pace of learning (3).

First of all, the employee can be given a certain amount of freedom in the e-learning sequences of a defined by the training department. They can decide on the order in which they want to follow the of the e-learning modules in the course (1). The employee may then be able to choose the content they want to follow or not (2). For example, the training department can impose all the e-learning modules of a training program. On the other hand, it can leave the employee free to choose the modules he or she wants to take according to his or her needs. When the modules are made available, the training department can give the employee a set amount of time to complete the module(s). For example, it can ask for the modules to be completed before the classroom session of the training program. On the other hand, he/she may not set a deadline for completion. An employee can choose the day and time he wants to take his e-learning modules, even if a deadline is set. This choice is only limited in the case of enriched classroom training. The learner must take the e-learning modules at a specific date and time according to the program defined with his tutor in the resource center. In addition, with e-learning, the employee has the possibility to go back to certain parts of a module as he or she wishes.

2.4. Pedagogical activities and duration of the e-learning modules of a course

"The learning activity [...] therefore corresponds to all the activities of an educational nature carried out by the learners. The learning activity [...] therefore corresponds to all activities of a pedagogical nature carried out by learners" (Vienneau, 2005, p. 46). According to Raynal and Rieunier (2005, p. 263), pedagogy refers to "any activity deployed by a person to develop specific learning in others. The term pedagogical activity is used in the remainder of paper to refer to any action taken by a person to develop learning in others.

Different pedagogical activities can be proposed in the same multimedia self-training module. Mayer (2003) identifies the reading of text, the reading of images, the viewing of videos, and listening to sound sequences. Several of these activities can be presented at the same time or separatel: reading text with listening to sound, reading text with reading an image. In addition, several authors (Favier, 2003; Moon et al., 2005; Mottay, 2005) state that exercises can be proposed to learners during their e-learning module such as taking knowledge tests before, during and after the multimedia training modules.

3. Organizational dimension: proposed definition and analysis of attributes

The previous sections have addressed the technological and pedagogical dimensions of e-learning deployment in companies. The approach of Welle-Strand and Thune (2003) indicates a third and final dimension to be taken into consideration: the organization of e-learning courses. A course can be deployed alone or in addition to classroom training. An employee can follow it from his or her workplace, in a training center or from home. On this point, Bernardin (2006), for example, has demonstrated a difference in employee satisfaction. In addition, several challenges arise with the deployment of e-learning in corporate training systems: the link with "existing training practices" (Baujard, 2004), the link "with other HR processes" (Henry, 2001), the link with other information systems (Chen, Hsiang, 2007; Homan, Macpherson, 2005), and the link to the company's overall strategy (Dagada et al., 2004). The study du Préau 2008 study shows a diversity of e-learning deployment modes among employees.

For Welle-Strand and Thune (2003), the organizational dimension corresponds to the question of "how": how are e-learning modalities exposed to employees? In our view, this dimension characterizes the different ways in which an e-learning course is deployed to employees. An analysis of the articles dealing with this aspect reveals the following aspects: the ways in which e-learning courses are introduced to employees (3.1), the ways in which employees are connection to the e-learning (3.2), the place of follow-up (3.3) and the forms of support (3.4).

3.1. Methods of introducing e-learning courses to employees

3.1.1. Free course and planned course

Bernardin (2006, p. 253) identifies two ways of making the same multimedia self-training modules available to employees self-training modules available to employees in his research on e-learning office automation in an airline company: "free entry" and "planned entry". The logic of free entry is based on the free choice of employees to follow all or part of the e-learning course course. The company can provide the employee with a set of pre-organized modules, or not, in a course. The employee decides whether or not to take the course.

Planned entry can result from two different processes. The first is based on a training department's request to employees to take e-learning modules. These are mandatory and are implemented, for example, as part of the implementation of new software or the evolution of a company process. The second is based on the individual annual interview, "part of which is devoted to expressing training needs" (Igalens, 1999, p. 117). An employee can ask his or her

supervisor to take certain training courses. The supervisor can also require and/or advise the employee to attend other training courses.

The final training request is then forwarded to the entity concerned, which validates it or not (Igalens, 1999). The training department will then send the invitation to the employee and will ensure that the training is The training department will then send the invitation to the employee and will ensure that the training is carried out correctly. The training courses requested may be based in whole or in part on e-learning courses.

3.1.2. Blended and all-e-learning courses

The way in which e-learning courses are deployed to employees can also vary in terms of the degree to which e-learning is integrated into the training. E-learning is in fact a continuum of practices (Sims et al., 2004; Wentling et al., 2000). Presenteeism and e-learning represent the two ends of this continuum (Mackay, Stockport, 2006). The first form (the classroom) serves as a reference point for positioning the different modes of deployment of e-learning paths, but does not constitute a form of online training. The second form (all-e-learning) places learners in a situation where they follow only the self-training multimedia modules of an e-learning course without any additional training in the presence of a trainer.

In between these two categories, "blended" training has developed strongly in recent years (Favier, 2003). They are generally defined as a combination of face-to-face and e-learning training sequences (Cappel, Hayen, 2004; Johnson, Tang, 2005; Lebrun, 2002; Montgomery, Wynkoop, 2002). The self-training multimedia modules can be used in different ways, in preparation, as a complement or at the end of classroom training sessions.

Finally, e-learning can be used as a support in a classroom training course (Bernardin, 2006; Bostrom, 2003). Marchand and Lauzon (2004, p. 54) put it this way the content of these applications (e-learning) is accessible to employees during training sessions in the presence of an instructor. training sessions in the presence of a trainer...". In line with this type of implementation some companies offer their employees the opportunity to follow self-training multimedia modules in a resource center in the presence of a trainer (Bernardin, 2006). In both cases, the multimedia modules serve as the main medium for employee learning. They follow them from computers in dedicated rooms. The trainers are then present to training programs at the beginning of the course and to help the employees in case of technical or learning problems. Employees and tutors are physically together in the same place. In this case, it is possible to speak of "presentialized e-learning" (Bernardin, 2006, p. 71).

3.2. Ways of connecting to e-learning

Whether they follow a free or planned course, in a blended or full e-learning mode, employees can connect to their e-learning course in different ways. An analysis of the literature reveals the following four modes of access to e-learning modules: e-mail (Lau, 2002), Intranet (Baujard, 2004) Internet and comp"It is often the intranet that plays the role of gateway to e-learning" (Baujard,2004, p. 38). A hypertext link to the e-learning platform, or to a set of specific modules, can be placed on the company's intranet. Employees click on the hypertext link and access the training content directly. Based on Internet technologies, a specific portal can also serve as an access point (Griffy-Brown, Hamlin, 2002; Morrison, 2003).any portals (Baujard, 2007).

It is a site accessible from the Internet or the company's Intranet. This site gathers links, information and programs on learning themes (Rosenberg, 2001).

The e-learning platform can also be directly accessible via a hypertext link (Baujard, 2007). Finally, employees can receive an e-mail with a hypertext link inviting them to follow the multimedia modules of the e-learning course.

The company's e-mail system can automate a certain number of events: start of the course, end of the e-learning course, reminder if the entire course has not been completed (Lau, 2002).

3.3. Location of the e-learning course

Employees may be required to complete their e-learning course in different locations. Bernardin (2006) indicates that an employee can access office automation modules from his computer located at his workstation or in a resource center.

Moreover, Marchand and Lauzon (2004) identify these two training locations in their study of ten manufacturing companies Spanjers et al. (2005) emphasize the (2005) point out the possibility of carrying out the e-learning course from home. Some research is beginning to report on the experimentation with mobile learning (Göth, Schwabe, 2005). Employees can employees can access training on their cell phones, even on public transport.

Sims et al (2004) introduce the notion of local and remote access modes of e-learning. Local access corresponds to a connection mode via the Intranet. The learner carries out his e-learning course from a place including a network physically connected to the company's Intranet. Remote access is based on the use of the Internet.

The employee is physically outside the company when he/she follows the e-learning modules in this case. This distinction is interesting because it allows us to categorize the training

locations mentioned in the previous paragraph according to two poles: local, i.e. physically present in a location belonging to the company, and distant. The workstation and the training center thus correspond to local access. The home or other location outside the home is a distant access.

3.4. Employee support procedures

The existence of a support service is one of the factors that facilitates the use of technological applications by employees. For Morrison (2003, p. 75), "the support provided to learners is a safety net". The objective of this section is to present the different types of support services that can be implemented to assist employees in their e-learning journey

Tutoring can be an integral part of an e-learning device (McPherson, Nunes, 2006). It can help employees to deal with the difficulties they encounter in their learning and/or difficulties in using e-learning technology.

However, it is not systematically implemented by companies and on all courses. Its presence or absence is a characteristic element of an e-learning course. It can take different forms, from online tutorials to learn basic navigation functions for example (MacCarthy, Hawking, 2004; Spanjers et al., 2005) to exchanges with physical tutors on technical issues (Morrison, 2003) or learning issues (Bernardin, 2006). In these last two cases, the modes of communication with employees can be based on synchronous or asynchronous modes (Johnson, Tang, 2005). The intervention of tutors can also have an individual or collective orientation.

More generally, Morrison (2003) identifies five levels of user support:

- Level 1, online help software: the objective is to enable employees to use the platform and/or e-learning modules independently. A list of frequently asked questions , a short tutorial on how to start their online sequence(s) or a help library, all accessible online, allows learners to find answers to minor problems when launching e-learning sequences;
- level 2, technological support: physical tutors are available to employees who encounter technical employees who encounter technical hardware or software problems not directly related to the use of e-learning modules;
- level 3, e-learning application support: the challenge for tutors here is to help employees to use the e-learning modules themselves in case of problems;
- levels 4 and 5, content support: these last two levels deal with learning difficulties. In level 4, trainers are present to respond to problems of understanding of the content presented in the modules. In level 5, which is more advanced, trainers In the more

advanced level 5, trainers are required to provide answers to specific questions from employees, such as the applicability of the concepts presented in the module to their work. They refer to specialist questions.

Training departments can then provide a support service to accompany employees during their during their e-learning course. Different levels of support can be put in place. The tutoring can be designed with physical tutors, who can be reached synchronously or asynchronously, or virtual tutors such as a launch tutorial. The roles assigned to these tutors can also vary: answering technical questions and/or questions related to learning.

To conclude this section, and in view of all the elements discussed, Box 2 the definition of the organizational dimension of the deployment as well as its different components.

Conclusion

The objective of this research is to propose a characterization grid of the deployment modes of e-learning courses. These e-learning courses can be deployed in different ways with employees. The challenge is to be able to characterize and understand the environment in which they are placed. Research has shown the influence of e-learning contexts on learning outcomes (Bernardin, 2006; Mayer, 2003) and learner satisfaction of learners (Bernardin, Ibid.).

The three dimensions proposed by Welle-Strand and Thune (2003) have been used to define the methods for deploying e-learning courses to employees: the technological dimension, the pedagogical dimension and the organizational dimension.

The characteristics of each of these dimensions were specified and enriched on the basis of other previous research. The technological dimension covers the technological infrastructure (hardware and software) that allows employees to access and follow and follow the multimedia modules of an e-learning course from a computer. Platform e-learning platform, network and computer stations are the main components. The pedagogical refers to the characteristics of the activities offered to employees in their learning path to enable them to learn. The theme of the content of the multimedia modules that make up the course, duration, pedagogical activities, forms of interaction and control are the main components. The organizational dimension corresponds to the way in which the e-learning course is offered to employees. Entry mode, support methods, modes connection, location and eligibility for the DIF are all characteristics of this dimension.

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