

D2.1 Overview of the current and emerging European Professional Training Market

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TIME2LEARN

D2.1 Overview of the current and emerging European Professional Training Market

DATE	27 May 2003
ABSTRACT	This document presents an overview of the current and emerging European Professional Training Market
AUTHOR	HEC
KEYWORDS	e-Training; Market trends; expectations; drivers; barriers
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1 Executive summary

Even though the worldwide e-training market is suffering from the present economic slowdown, it continues to offer real growth opportunities.

Training is shifting to a new model characterised by lifelong learning, customisation of content and a more flexible access to learning. The potential offered by the extensive access to and use of Information Communication Technology (ICT) is raising expectations within the e-training market. Consequently e-training offers interesting growth opportunities within the learning segment for the coming years.

However, it appears that a low market transparency and poor quality content are still major hurdles to the full development of e-training. These barriers need to be overcome in the future to grant an optimal development of e-training.

Furthermore there are still deep gaps between the different European regions preventing rapid market growth. Given the distinctive nature of the European market (regional legal, political, language differences etc.) so called "European data" must be cautiously analysed. Indeed, such data is often extracted from regional markets and then aggregated and therefore does not enable us to make a fully relevant and homogeneous overview of a unique European market. Therefore an analysis must always take into consideration regional specificities. This is what we have strived to do in this present European Professional Training Market Overview.

There are however factors common to the whole of Europe, that is to say Europeans faith in education and the consequent important investments being made in this sector. Furthermore there are an increasing number of Europeans familiar with on-line transactions and use of ICT in everyday life. These common factors provide the dynamics necessary to enable market convergence and offer the building blocks for a more European homogeneous model. At the same time there is need for clear support on a political and legal level by the European Commission, who really has a key role to play in accelerating the emergence of a common European e-training market.

2 Introduction

Time2Learn's goal is to define a roadmap for the future of e-learning. In an attempt to compare the trends of the demand side of the market and of the supply side, we have tried to draw up a picture of the European e-learning market as it is today and to define possible paths of evolutions in the near future.

Desk research and interviews with purchasers and users of e-learning services in corporations are the main tools used. This document is the synthesis of the desk research, and aims at providing a good understanding of the market at a macro level, whereas the interviews, the results of which will be published later in Q2 2003, will focus more on a micro level understanding of the drivers.

The scope of this work is restricted to e-learning and continuous training in European corporations. When faced with studies or data concerning e-learning without further details, we have tried to sort out the data concerning the academic market. However, as always when dealing with e-learning, it has been difficult to make numbers and definitions from various sources coincide.

Therefore, some information is provided per country, and it is not always aggregated on a European level. The first conclusion of the study would even be that the European e-learning market is still fragmented with national/regional specificities and must be dealt with caution.

3 Training markets: an overview

The worldwide training market has also fallen victim to the weak economy and has to face a pace of recovery that is slower than originally anticipated; nevertheless, significant growth rates are expected. While the revenue for IT and business skills training will not live up to earlier expectations, long-term market forecasts for both training segments remain strong.

We stress out that available market figures can vary greatly from one source to the other. We present here IDC results, which are often considered as optimistic ones, as one of IDC's global views is that e-learning shall replace and increase traditional training methods.

According to IDC the worldwide IT education and training market will reach \$28,6 billion, the U.S. corporate business skills training market will reach \$18,3 billion by 2006 (IDC 2002/9).

Training segment	Billion \$ (by 2006)	Compound annual growth rate (CAGR)
Worldwide IT education and training market	28.6	7,1 %
U.S. corporate business skills training market	18,3	13,3 %
European business skills training market	13,0	14,9 %

Both IT and business skills markets offer tremendous opportunities for growth within the e-learning segment. IDC estimates that the corporate e-learning content in the U.S. will grow at a nearly 37% CAGR between 2001 and 2006. Organizations in the U.S. as well as in Europe will continue to both replace and increase the use of traditional forms of training with e-learning, for reasons of efficiency and convenience, accompanied by a more instructionally sound use of the delivery medium (IDC 2002/9).

According to IDC's research and forecasts, the European business skills training market is supposed to increase at a five-year CAGR of 14,9% and will reach \$13 billion in revenue in 2006. IDC estimates that over 27% of business skills training content will be provided via e-learning by 2005. This represents a CAGR of 108,2% over a five-year period (IDC, 2002/1) and suggests a market opportunity of up to \$3,5 billion for the development and exchange of e-learning content.

"European training organizations are beginning to offer a mixture of both ILT and e-learning services but this is at an early stage as the European e-learning market is still in its infancy" (IDC, 2002/1).

In terms of e-learning adoption and development, the most advanced regional markets are

- the United Kingdom,
- the Netherlands,
- Scandinavia.

Senior Research Analyst for IDC's European e-learning and Skills Management Services, Sheila McGovern, points out the following issues, thus giving a brief overview of relevant developments affecting the European e-learning market (IDC, 2002/1):

- Economic downturn

In an economic downturn, the pressure to cut costs increases and although training is considered a competitive advantage by many organizations, it is often perceived as a time-consuming cost center.

- Economic recovery

According to IDC, market growth will be affected by the global economic slowdown but "this will only be a temporary set-back in 2001 and 2002. We expect normal market growth to resume in 2003".

- Outsourcing

"... an increasing number of companies will turn to business skills training outsourcing, particularly e-learning, as a result of the technology developments that have rendered training less costly and more effective." In addition, this enables European companies to focus more on their core competencies.

- Business skills market

"As skills training is increasingly offered through the Web and companies acknowledge its value in terms of solving business problems, the business skills market is expected to outpace that of IT skills."

These trends are general and widely recognized. However, finer analyses within specific organizations or for specific types of training may give other specific results.

The following figure shows the past and estimated future development of the e-learning market in terms of content, services and delivery solutions, indicating a significant upturn in each of the market segments.

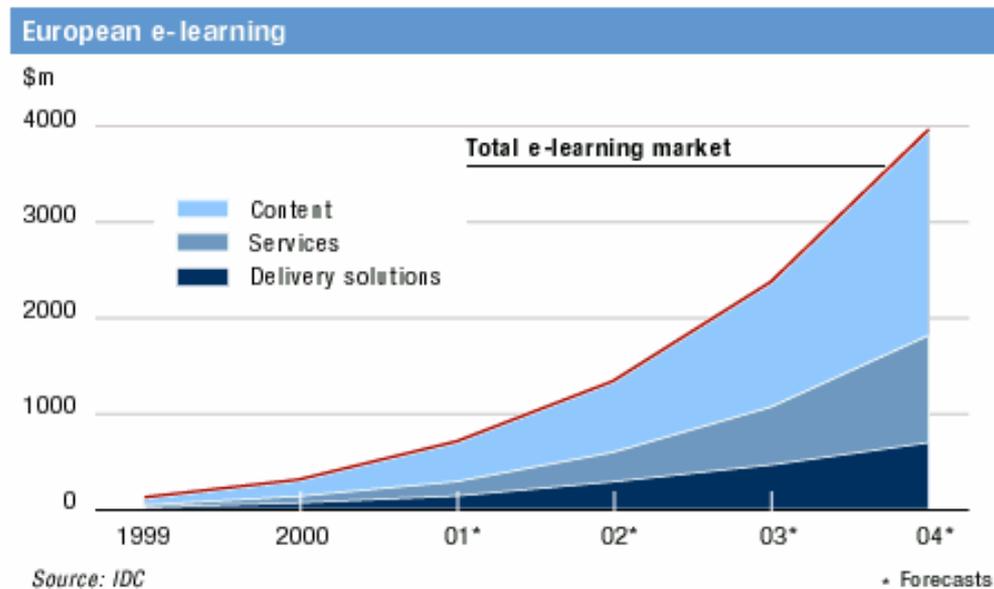


Figure 1: Development of European E-Learning Market (source: IDC, 2001)¹

Most of the European companies involved in e-learning are both suppliers and users. This proves a study amongst 653 organizations based in the European Union, which reveals that 60% of those deploying ICT supported learning, are providing and using it for training.

The e-learning market seems to be similar to the market for academic literature, where authors of books and journals sold also make up a significant proportion of purchasers (Cedefop, 2001, p. 14). This would reinforce the idea that there is a substantial demand to exchange learning resources on a B2B level.

¹ Financial Times: E-Learning on course for strong growth, 6 June 2001, <http://specials.ft.com/fit/june2001/FT3F80T0JNC.html> (20 Oct 2002)

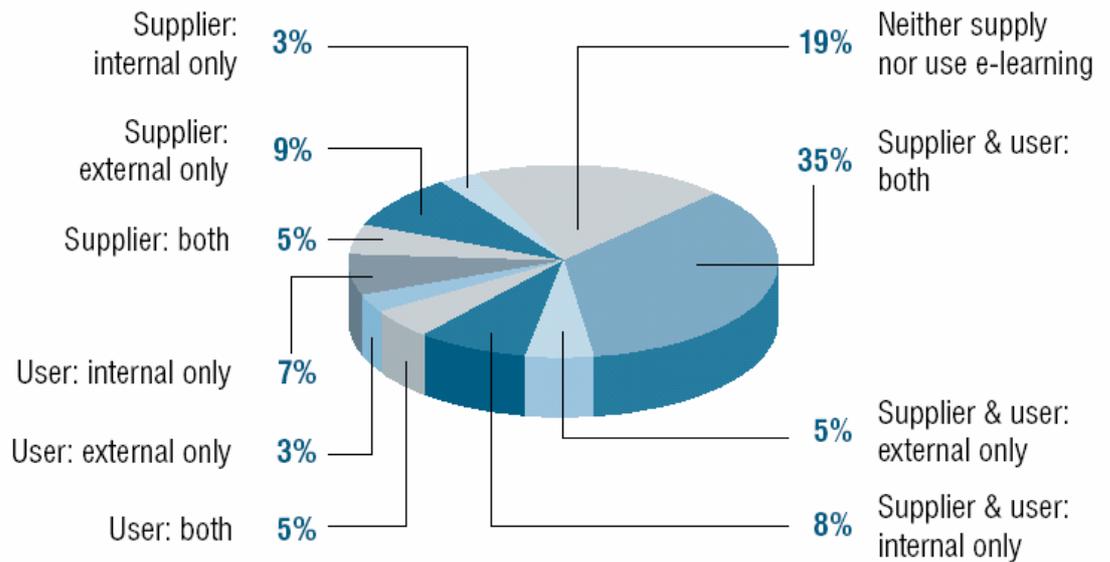


Figure 2: Division of suppliers and users of e-learning (source: Cedefop, 2002, p. 11)

Most suppliers (around 80%) provided training to external users. Equally, most organizations, which were users of e-learning, purchased training from external providers, in addition to internal provision. (Cedefop, 2002, p. 14). This again verifies IDC's statement on strong outsourcing activities on the e-learning market.

Note that Cedefop surveys are based on spontaneous surveys on the web and their results are therefore to be taken with caution.

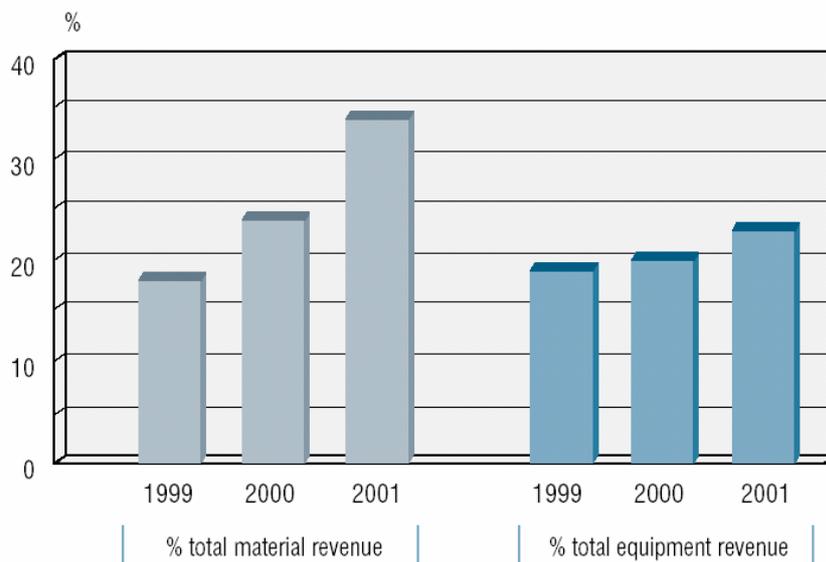


Figure 3: E-learning as a share of revenue from the supply of training material and equipment in the EU (source: Cedefop, 2002, p. 31)

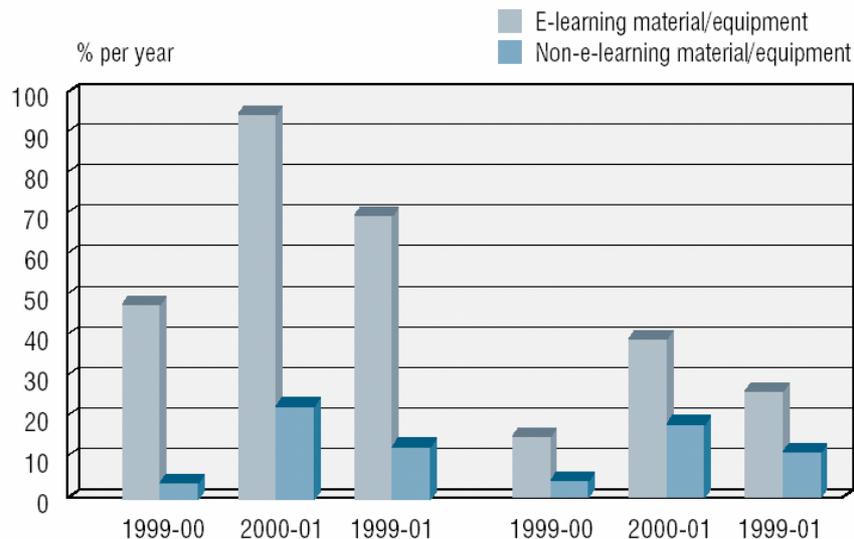


Figure 4: Growth of revenue from the supply of e-learning and other training material and equipment in the EU (source: Cedefop, 2002, p. 32)

Considering the supply side, in 2001 e-learning accounted for a third of total revenue derived from providing training material (see Figure 3) by suppliers responding the Cedefop-survey (2002, p. 31). The term “training material” relates to program content delivered in the form, for example, of CD-ROMs or online or Internet-based services. (On the one hand, the analysis is likely to understate growth in this segment, as it is confined to respondents giving data for adjacent years and excludes new entrants on the training market; on the other hand it excludes organizations which leave the market, thus slightly overestimating the market. In this case, it is likely that there were more entrants than exits in 2001) (Cedefop, 2002, p. 31).

During the last 3 years there has been a substantial growth in e-learning revenue; growth averaged 70 % a year, while for other training revenue, it was limited to 13 % on average a year. In 2000, revenue from e-learning material by respondents increased by 48 % compared with an increase of just 4 % in non-e-learning based material. In 2001, revenue from e-learning material is estimated to have nearly doubled (95 %). E-learning was responsible for most of the increase in revenue from providing training in 1999 and 2000 (Cedefop, 2002, p. 32). The e-learning sector is supposed to continue to have a major impact on the training market within the forthcoming years.

Regarding the demand side, in 2000, expenditure on e-learning material by users increased by over 40 %; in 2001 the growth in spending on e-learning was estimated at about 14%. Considering the relation of spendings on e-learning and other training methods, a market shift in expenditure towards e-learning methods can be observed. Training users responding to the Cedefop survey spent around 14 % of their total current outlays on e-learning, at the same time current outlays on other forms of training fell slightly (Cedefop, 2002, p. 33f).

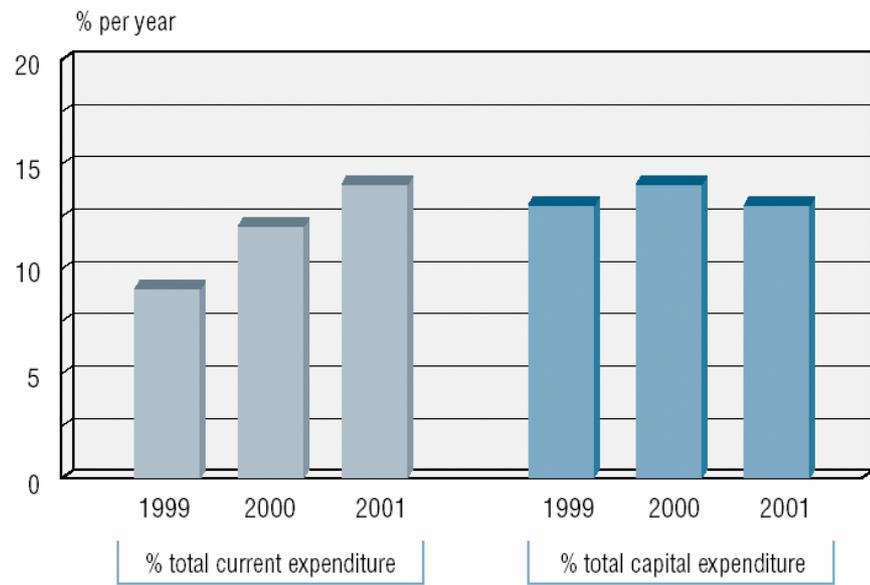


Figure 5: E-learning as a share of current and capital expenditure on training in the EU, 1999-2001 (source: Cedefop, 2002, p. 33)

4 Training in the future

Trying to foresee the future of a given market is a task many have failed upon. No precise numbers for market volumes or values will be found here: we are not trying to find what the future will be but rather explain possible paths of evolution and their causes.

4.1 Three main directions of change

4.1.1 De-institutionalisation and 'marketisation'

This phenomenon increases the autonomy of learners in choosing and buying e-learning services and creates a huge potential learning content market with really independent actors (learners, providers, trainees, ...). Training is moving from a monopoly ruled by several institutions to an entirely competitive market.

4.1.2 From traditional education to lifelong learning

The ICT (Information and Communication Technologies) enable training processes at each step of professional life, from the time of recruitment to retirement. As e-learning enhances flexibility and quality, it can now be adapted to every category of user: from newly hired staff who need to be integrated and given a necessary background of know-hows, to established workers, who need to complete and update their skills their life long.

4.1.3 Rigid training systems

Corporate training should be customized and specially designed for companies: each company wants to address to the fast changes of society in its own way, considered to be the best and right way. Obviously, they don't accept 'ready-made' systems, but are looking for original and personalized methods. Today, e-learning content providers (e-learning firms) apparently do not cover the entire range of corporate needs.

4.2 Dimensions of change

4.2.1 A new institutional context of learning

The increasing penetration of ICT in companies and the level of economic development brings changes in the structural environment of learning by increasing the role of national and international partnerships and networks. It develops a higher level of interest in lifelong learning, which is set as a priority for numerous countries, and strengthens the links between formal and informal learning.

4.2.2 Changing market organisation

The e-learning market today has a low level of transparency as well as low entry barriers market. Interest in value added services (mentoring, tutoring, tests, etc) is rising and numerous new comers, alliances (national and international) and partnerships (particularly

public-private) are emerging. In order to survive in the marketplace, e-learning products must display a certified level of reliability and pedagogical quality. The role of the content provider is more and more important and visible in the context of a shortened lifecycle.

4.2.3 Allocation of resources

Traditionally, the main focus of investments has been increasing ICT penetration. This was true not only of countries such as Spain and Greece, where it is always the case, but also of all other countries. The new allocation of resources is now focused on the 'user' field : efforts are made in the fields of guidance and support services for users, and no longer restricted to the technological field (equipment, web access, networks).

4.2.4 Diversity and quality of provision

Quality is still a major issue for e-learning, as is shown by the new interest in branding and quality assurance issues. At the same time, the range of provision is increasing with new learning materials, support services, back office functions. For a given country, the range of provision is all the more important that IT penetration is successful and widespread.

4.2.5 More flexible access to learning

Four areas are identified in which flexibility is increasing: time of learning (access availability, courses duration, ...) , space of learning (at office, at home, on holidays, ...) , tools (different methods, guidance, ...) and content. The aim is to suit different learning habits of people in the world and address different cultures and styles. Both learning delivery and personalization of core skills have to be more flexible.

4.2.6 Learner-Provider relationship

E-teachers must be, above all, teachers. Therefore, content providers must not concentrate their effort on technological issues, but should be centred on learner needs, including complementarity between e-learning and face-to-face communication. The relation between Learner and Provider is now including an increasing trend in the area of autonomy and control of the learners.

5 Training innovation

5.1 Infrastructures and access

The major trend is that policies are now access-oriented. This means the emphasis is put on access to content by means of technological infrastructure, instead of infrastructure-oriented content. This evolution appeared first in Western Europe (before 1995), then in Southern EU countries.

What did it consist in exactly for European countries and the EU ? The first step consisted in supplying schools and firms with computer material (with programs such as "Schulen aus Netz" in Germany for instance). In a second stage, the content was modified in order to target a larger market (including senior people) and to provide new actors (museums, libraries...). The third step was to diversify content. Countries such as Greece or Spain are still focusing in this area, and lagging behind France or Germany. In Denmark, Germany or the US, emphasis is put on training teachers to use technological tools properly.

Moreover, a current major concern is that access must fit people's needs during their entire life. Concepts of "lifelong" or "lifewide" learning are becoming a reality.

5.2 Partnerships and networking

5.2.1 Public-private partnerships

State-owned and market actors increasingly collaborate in order to increase efficiency. Thus, US corporate training is increasingly outsourced to universities.

Public-private partnerships make it possible to accelerate innovation and fund research in the training process. Another goal in making companies and universities collaborate is to reconcile labour supply and demand in terms of professional skills and profiles. There are already various degrees of synergy between companies and educational institutions.

Synergies can also be found between economic sectors. This type of initiatives is seldom found in the US, but exists in Spain. The Banco Santander, the CSIC and the Ministry of Technology and Research have created together a portal for students, from school to continuous education.

At the EU level, the European Investment Bank launched in 2000 the "Innovation 2000" initiative (i2i). Its goal is far-reaching offering funds to various projects and SMEs, supporting public-private collaboration initiatives, helping computerisation in schools and IT training centres, finally, creating infrastructures for less developed regions in the Union. The main tool used is the grant long-term loans: therefore, the EIB selects the most sustainable projects. Three main actors are involved in these projects: educational institutions, companies and the media.

The problem is that most collaborations start as short-term marketing operations. In addition, many suppliers focus exclusively on their own interests and the fallout for Europe as a whole is ignored. In fact, large-scale projects in education are concentrated in large (mostly US-based) multimedia and IT groups.

5.2.2 Exchanging knowledge

We have witnessed several initiatives launched to share knowledge, in order to lessen the cost for access to learning resources, or for creation of learning resources..

The Kaieteur Institute for Knowledge Management has defined ten types of 'knowledge exchanges' (<http://www.kikm.org/>.)

1. Knowledge Auctions
2. Knowledge Stores
3. Question & Answer Exchanges or Experts Exchanges
4. Intellectual Property Exchanges
5. E-Learning Exchanges
6. B2B Knowledge Exchanges
7. Talent Exchanges
8. Community Based Social Capital Knowledge Exchanges
9. Vertical Knowledge Exchanges
10. e-Knowledge Market Enabling Technologies

1. Knowledge Auctions

This type of exchange is designed to be a community site for trading intellectual capital assets. At the heart of the exchange is a dynamic pricing mechanism, where sellers can ask, and buyers bid, on the knowledge items for sale. An example of this type of site would be <http://www.knexa.com/>.

2. Knowledge Stores Or Malls

This type of market is a virtual store or mall where knowledge products especially, can be listed by sellers and purchased by buyers, usually for a fixed designated price.

A classic example of this type of site would be <http://www.knowinc.com/>

3. Expert Knowledge or Question & Answer Exchanges

There are some sites in this group, the focus of which is mostly on aggregating a catalogue of experts in an expert directory, who can be contacted for technical advice. There are some sites founded mostly on a Question & Answer paradigm.

Some sites represent a hybrid of these two approaches. Some have a vertical flavour in the sense that they may be focused on aggregating a community of experts in a particular field such as IT. Some operate using a "free" business model, and others operate on a royalty model. What they have in common, is the creation of a virtual on-line exchange for people with questions to be matched with experts who can supply answers.

Good examples would <http://www.experts-exchange.com/> and <http://www.keen.com/>. Yahoo has just entered the fray with a new site at <http://experts.yahoo.com>

4. Intellectual Property Exchanges

Intellectual Property exchanges are targeted at the creation of an on-line market-place for the trade of intellectual property such as patents, trademarks, copyrights, software licenses. Such exchanges are unique environments, requiring support services to help people with the packaging and description of the items for sale; they may require anonymity and may involve specialized protection and valuation challenges.

Leading examples are <http://www.yet2.com/>, and <http://www.pl-x.com/>

5. Stock Market or Investment Knowledge Exchanges

The investment community appreciates the fact that knowledge is indeed key for power. A number of sites have been pioneering a knowledge exchange model where people trade or invest knowledge with others, and become rated as experts based on the community rating of their success.

An example of this type of virtual market-space is <http://www.iexchange.com/>

6. e-Education or e-Learning

These are sites that aggregate training courses, educational content, and learning resources whereby people can connect to the network and engage in e-learning on-line for a fee. A leading platform enabler is <http://www.saba.com/>

Fatbrain.com recently announced it would launch a “Learning marketplace”.

7. Community Oriented or Social Capital Oriented e-Knowledge Markets

These types of sites are community exchanges set up to foster economic development and the growth of society. They have an underlying shared purpose. Their logic is that all network members should be able to participate in the benefits of knowledge exchange. An example is the NARS Knowledge Marketplace that the FAO is planning to introduce. The FAO is a United Nations agency, with a mission to foster development in Food and Agriculture. By hosting and organizing a digital knowledge marketplace, it uses similar principles to the other types of e-knowledge exchanges. However, the purpose, in this case, would be more for broader stakeholder benefit.

8. Intellectual Capital Exchanges

These are digital market-places for trading talent, work, jobs, professional services, projects. In other words, for matching the supply and demand for human capital. This is a segment that is being driven by the war for talent; particularly in technical fields. It is also an outgrowth of the e-lance and free-agent economy. There is quite a range, in terms of the focus and sophistication of these types of sites.

Prime examples of such community exchanges would be www.hello.brain.com/, www.iq4hire.com/, and the Monster Talent Market at www.talentmarket.monster.com. Another example is www.earthweb.com/ and it's “IT Services Knowledge Market”.

9. Vertical Knowledge Market-Places

These are knowledge exchange sites with a particular industry focus such as Oil and Gas, Construction, Health Care and so on.

10. B2B Knowledge Markets

These are e-knowledge exchanges designed to process knowledge transfer between corporations. The B2B revolution is streamlining supply chains in such dimensions as logistics, and procurement. In a parallel fashion, B2B e-Knowledge markets rationalize communication and knowledge supply chains within a specialized community context.

An example is www.ebrainx.com.

5.3 Innovative practices

5.3.1 Pedagogical innovation

Two major trends are defining the evolution of e-learning pedagogy: a greater personalisation of content and a stronger learner control. Technology facilitates relationships and interactions between trainers and employees. Learning activities tended to be quite tightly defined; they are now more and more open-ended. The introduction of pictures, videos and learning tools

is facilitated and personalized support is made possible with e-mail. Access to experts is sometimes made easier (to the extent that the expert agrees to spend time answering questions). Logging or tracking of activities creates bearings and eases navigation, which positively affects curiosity. Feedback tools help employees evaluate their progress.

We should also notice that the hardware and software necessary to take advantage of online learning is available in many places, hence the development of e-learning at home.

5.3.2 Recent examples of public initiatives

Here are some examples of innovative practices related to ICT integration in companies.

The German Ministry of Education and research has created an action programme on lifelong learning entitled "Life-long accompanying learning for all". This initiative focuses on permanent training and further education, mostly in vocational form. In Denmark the "Virtual VUC" project aims at integrating ICT in general adult education. Lastly, in 2001, the Scottish Minister for Enterprises and Lifelong Learning opened the "Spark of Genius high-tech learning centre" whose goal is to bring opportunities to unemployed and disabled people. Spark of Genius provides the local labour market with advanced e-trade and marketing skills training. It has also set up facilities for visually-impaired people to use the Internet on an equal footing with the others.

6 European market overview by regions

6.1 General situation: Market drivers and hindrances

Many factors have helped the European e-training market to develop. First, education has become a central determinant in actual growth. At the same time, an increasing number of people are becoming familiar with on-line transactions. According to the May 2002 Information Society report called "Technologies For Major Work and Business Challenges", another strong asset of e-learning is linked to ICT which provide learners with the possibility to access high quality learning content from virtually anywhere at anytime.

Countries have set up national programmes, and the European Union has also strongly committed in e-learning. "Information Society Technologies" and "Citizens and Governance in a Knowledge-based Society" belong to the priorities of the EU research and development funding. Among the projects, public-private partnerships are privileged as one gets more and more aware of their large potential.

Finally, the quality and breadth of e-learning services keep growing (customisation, enhanced support and maintenance...)

However, some hurdles to the development of e-training should not be underestimated. The economic outlook is not very optimistic: depression, low market transparency, mismatch between supply and demand...

The May 2002 Information Society report mentioned the strong influence of the traditional "schooling" model by current generations. This influence is expected to be a break for the development of e-learning market.

Investment in learning is still not very important, compared with investment in pure technology. Therefore, the quality of content often remains poor. In addition, issues such as ownership and IPRs have not been solved yet, which strengthens the reluctance of market actors.

E-Learning in Europe means, above all, e-Content. The content segment has built up the strongest market position. In five out of the eleven countries we have examined, pure content providers have captured the biggest share of the market in the e-learning-sector. Standard content is still playing a minor role in Europe. Standardized content dominates only in two countries, namely Denmark and the Netherlands. With the exception of Sweden and Finland, where the emphasis lies in personalized and/or personalizable contents, companies that offer both standardized as well as personalized content form the greater part.

Subjects offered as content cover more than just EDP and IT. This wide range includes business and management courses, law and finance, foreign languages, technical, medical and chemical sciences as well as product training and soft skills.

E-Learning in Europe - also means full service. In four out of eleven countries examined, the providers have usually put together a full service package. The trend that the same provider offers both content and technology is with, 67% and 58% market share respectively, most wide-spread in Austria and Germany. In the Netherlands, 45% of the companies surveyed offer their clients full service; while with 44%, Greece lies only one percentage point below. In Italy and Ireland, content and full-service providers have a roughly equal share of the market.

Among the great number of companies on the European e-learning market, the technology sector is only visible as a small segment. In none of the countries surveyed do providers that offered only technology, (i.e. platform and system) dominate the picture. The share of

technology providers is, on average, 14% in the countries examined. Only in Greece, Denmark and the Netherlands do the technology providers have a more prevailing position compared to the European average, with a 25% market share.

Concerning the areas of business that boost the respective national e-learning market, banks and financial services rank at the top throughout Europe. Lagging clearly behind this sector, the IT sector, together with further education institutions, comes second. Telecommunications takes third place, followed by public authorities and the automotive industry .

e-Learning and Knowledge Management

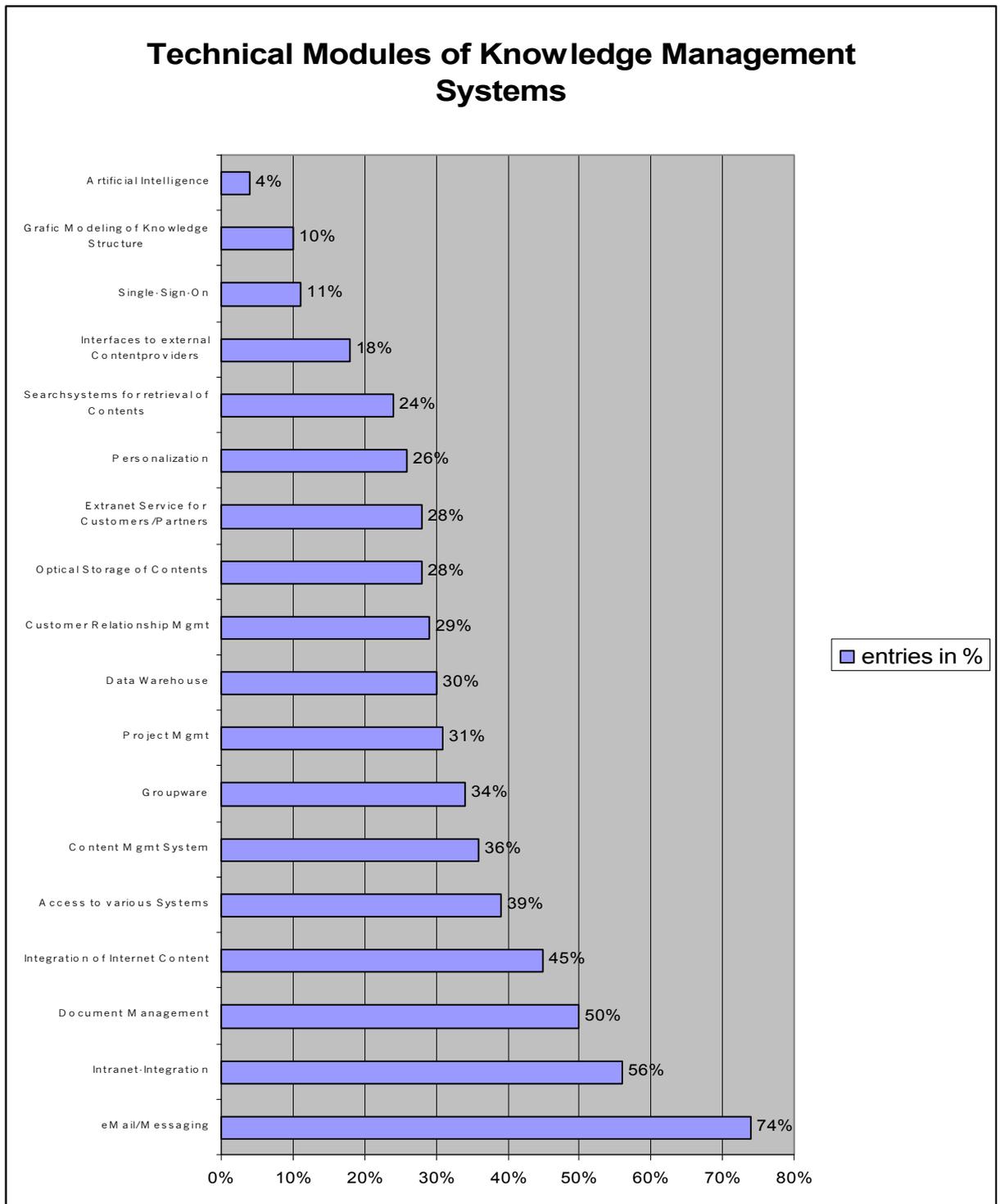
e-Learning solutions are being implemented first in corporations which business is intensive in intellectual capital. In these companies, e-learning is strongly bound to Knowledge Management in the eyes of managers, as they understand the following logic: learning in our corporation means sharing the knowledge.

We therefore found interesting to study where bridges can be set between the e-Learning market and the Knowledge Management (KM) market.

We have used a study on functionalities of KM System to compare them with functionalities of e-Learning applications and Learning Management system. Knowledge Management (KM) is understood as the systematic utilization of knowledge resources within the corporation.

Different functionalities of KM solutions are covered by various technical modules. Not all possible modules have to be offered by a KM solution. According to the strategy of the KM solution provider and / or by the users needs, additional modules can be added to an existing solution, depending on the flexibility of the system.

In the figure below an overview of these possible technical modules is given. The source for this data is a KPMG market survey on KM systems "Knowledge Management in the Context of eBusiness" conducted among 1.300 German enterprises of various industries in June 2001.



Taking the list of the 7 most wanted functionalities shows an interesting similarity with functionalities needed for e-learning systems.

e-Mail messaging:

A basic and useful functionality offered by nearly all LMS.

Intranet integration:

Companies using Human Resources software and intranets and investing in a LMS always want it integrated in the actual intranet in order not to duplicate databases, entries.

Document management:

Let's change the word "document" with "courses or learning resources" (the Knowledge lies in documents, the teaching in courses). Updating, searching, retrieving the right resource in the shortest time is functionality shared by many KM systems and LMS.

Integration of internet content:

This functionality has a dual sense: First using the resources of the internet as a whole in the KM process, and second, using standard internet technology for the transfer of information, therefore without the need of specific software, hardware or formats.

The very same is true for e-learning. However, within a company, the internet content will be available on the company's intranet and the use of basic standards is a growing need: not having to possess more than a standard computers with some standards plug-ins to be able to deliver and assess the e-learning seems to be an emerging demand.

Access to various systems:

It is a complementary proposition to the previous on (integration of internet content). Provided that the corporation must deal with various proprietary systems of different providers, it will look for a closer integration of these systems. One of the answers is the use of standards instead.

On the e-learning level, this requirement is not often found as the company having invested in a given proprietary LMS will not in the first years try to integrate content from other LMS. However, we witness a growing demand to access various systems to pick what one need at a given time.

Content Management Systems:

Clients want to be able to manage the content in their KM applications, update it, make additions or deletions, adaptations, etc. Knowledge is not frozen, therefore the content isn't either.

The same is true with e-learning content that often need to be updated.

Groupware:

Sharing knowledge is a network activity and groupware functionalities are wanted in KM solutions.

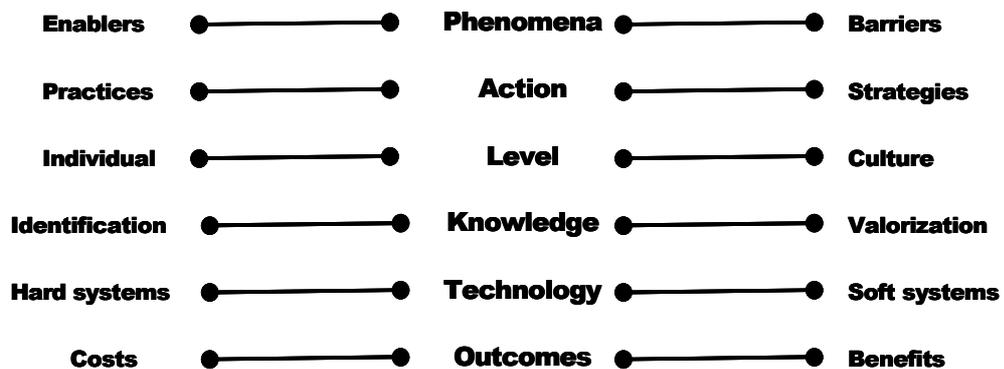
For e-Learning, on of the recurrent weakness is the lack of interaction. Put in other word, e-Learning systems are expected in the future to be able to handle group activities and interaction, i.e. groupware.

This short summary leads us to think that Knowledge Management market trends are interesting to be followed when one wants to understand some of the trends of the e-Learning market. The results from the "Survey Research in Knowledge Management: 1997 – 2000 " of the eCKM: The European Center for Knowledge Management (April 2002) can also help us understand why KM and e-learning share common ways of thinking.

The study highlights the general characteristics of a group of 23 surveys on the theme Knowledge Management. Geographically, the group focuses on Europe and / or North America and the search was restricted to three Indo-European languages (English, French and Spanish). Within the European / North American axis, the majority of surveys were multinational in orientation, with only four (4) investigating KM in a specific country. Sample sizes range from 20 to 1,626 with the majority of surveys collecting between 50 and 400 responses. These 23 surveys were most often initiated solely by a consulting firm (13 cases), but never by a corporate research unit or a publishing firm acting alone. A combination of academic, corporate, consulting and / or publishing firms initiated the survey in five (5) cases, and five (5) others were authored and administered solely by an academic.

This databank of survey instruments was deconstructed, survey by survey, in order to identify major research themes and detect or extract the constructs they employed. The themes and constructs were assembled an overarching framework which is believed to represent the organizing logics used by the authors of the surveys. Six dimensions were identified this way: Phenomena, Action, Level, Knowledge, Technology and Outcomes (Figure below).

Figure 1: Six Dimension Framework



This framework is presented as six dimensions with contrasting poles. The very same could apply to e-learning systems, meaning when corporations think of e-learning systems, the thinking behind it fairly closed to the thinking behind KM systems. What are the costs/benefits (of course), the technology aspects, the identification and valorisation of the content (learning or knowledge), at which level to apply the system, what should be its goals, why would people accept or reject it.

As for the trends in Knowledge Management, the survey shows a global move toward increased differentiation, as the demand is becoming always more precise and adapted to the specific needs of the corporation. The same is probably to be expected from the e-learning market.

Whatever the bonds between e-learning and knowledge management, we do not focus on the latter, but merely stay aware of its evolution and try to spot its trends.

6.2 United Kingdom

6.2.1 Main Conclusions

E-learning

- Less than a third of companies use e-learning for any group of employees
- Where e-learning is used, IT staff are the chief beneficiaries; it is used less frequently for managers, and hardly at all for manual workers
- e-learning is used mostly for IT and technical training, and much less for 'soft skills' training
- the majority of organizations using e-learning spend less than 10 per cent of their overall training budgets on e-learning
- most training managers using e-learning think it is more effective when combined with other forms of learning and that it will only have a marginal effect on classroom training.

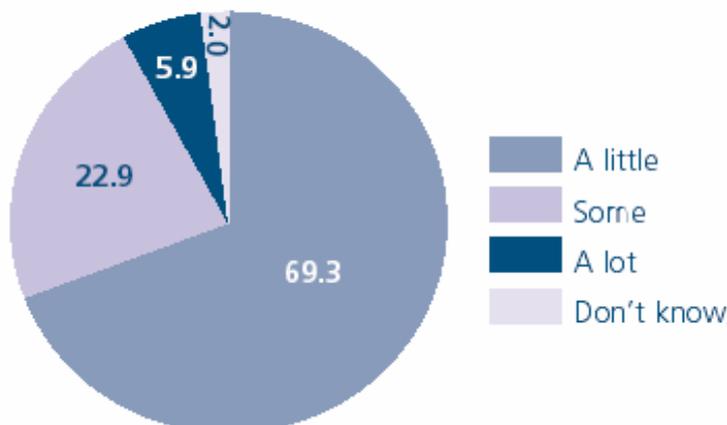
Costs of training

- The total annual cost of training per head, excluding most costs of on-the-job training, is around £360
- Daily payments to external training suppliers range from an average of £925 for trainers of senior management to £425 for those who train manual workers.

6.2.2 E-learning in the UK

While IT skills are fairly widely embedded in the labour force, the same is not the case with e-learning. Of the 502 respondents in the survey (Source: Chartered Institute of Personnel and Development – CIPD "Training and development 2002" April 2002), only 30.5 per cent (or 153 respondents) reported using e-learning for any group of employees within their establishments. These users of e-learning were asked how much training time was accounted for by e-learning: 'a little', 'some', or 'a lot'. Figure 1 shows the results.

Figure 1: Training time accounted for by e-learning
(organisations using e-learning)



Thus, only 6 per cent of those using e-learning used it 'a lot of the time' in training. The majority, almost 70 percent of those using e-learning, used it only 'a little'. Even in financial services, where almost all employees have basic IT skills, over 70 per cent of training managers used it only 'a little'. Because the number of employees using e-learning is low, such comparisons across industries can only be viewed as indicative. For this reason, the rest of the e-learning results are reported without reference to sector, and are confined to the data coming from the 153 cases using e-learning.

Which categories of staff use e-learning ?

A question was asked about the categories of staff using e-learning, and the categories for which e-learning accounted for more than 10 per cent of training time (Table 1). Not surprisingly, IT staff topped the list. Then came professional, clerical/administrative and technical staff, with around 40 per cent of respondents using e-learning for them. E-learning was less frequently used for managers, especially senior managers, and rarely used for manual employees.

Staff category	% of establishments
IT staff	56.2
Professionals	43.1
Clerical and administrative	42.5
Technical staff	39.2
Middle and junior managers	34.0
Senior managers	24.2
Manual staff	7.2

Table 1: Types of staff for whom e-learning accounts for 10 per cent or more of training time (in organisations using e-learning)

What is e-learning used for?

Predictably, e-learning tends to be used most for IT training (84 per cent) and to a lesser extent technical training (61 per cent). It is less extensively used for the training of managers, with almost half the respondents who used e-learning using it for that purpose. (The most recent survey from the American Society for Training and Development shows a similar trend.) Overall there appears to be an obvious gap between using e-learning for developing IT and other technical skills and using it for other purposes, such as 'soft' skills training; only 21 per cent used it for teambuilding and 34 per cent for interpersonal skills training. (It needs to be added that these figures say nothing about the extent of usage.) Almost half of respondents using e-learning thought it was unsuitable for training in soft skills (Table 2), although some CIPD members are clearly using it for that purpose.

	%
IT training	83.7
Other technical training	61.4
Management training	48.4
Health and safety	35.3
Interpersonal skills	34.0
Induction	31.4
Sales and marketing	22.2
Teambuilding	20.9

Table 2: Respondents (in organisations using e-learning) using e-learning for ...

Who produces e-learning materials ?

Because training is arguably more effective when materials relate to the organization concerned, rather than being generic, respondents were asked whether they had produced e-learning materials specific to their organizations. Sixty-one per cent of the respondents using e-learning – 94 organizations – said that they had done so. Of these, 44.7 per cent had more than half of their e-learning materials developed specifically for their establishments. Just how these e-learning materials are developed varies. About 40 per cent produced e-learning materials in-house, around 10 per cent used external consultants and half used a mixture of the two methods. It seems that a great deal of e-learning materials are tailor-made, irrespective of where they are developed. It may be that the early adapters of e-learning in the UK have very specific applications in mind, which require specially commissioned rather than generic materials.

How much do organizations spend on e-learning ?

Despite the fact that many establishments are creating their own materials, e-learning does not account for a significant proportion of the training spent. Table 6 shows that half the training managers using e-learning spend less than 10 per cent of their training budgets on it, with less than one-quarter spending between 10 per cent and 25 per cent of their budgets on e-learning. Only a very small proportion (5 per cent) spends more than 25 per cent of their budgets on e-learning. This low expenditure on learning technologies is confirmed by the separate CIPD survey of training costs (see below). Such low spending may explain why more than one in five respondents (21 per cent) did not know how much of their training budget was devoted to e-learning.

	% of budget spent on e-learning
Less than 10%	50.3
Between 10-25%	23.5
More than 25%	5.2
Don't know	20.9

Table 3: E-learning expenditure as a proportion of total training budgets (in organisations using e-learning)

Another survey looks at what 753 people who underwent training at work in the 12 months before the survey – the customers – thought of the training they received, what they found most useful and who received most training opportunities.

- Classroom and on-the-job training are the most used forms of training, but on-the-job training is by far the most popular method, with over half the respondents rating it their best method of learning.
- Only 16 per cent said classroom training was their best method.
- Nearly a quarter of respondents had undertaken some form of learning outside work in the past 12 months.

Different forms of training – how much are they used and how useful are they ?

The 2001 CIPD training survey showed that the two most used forms of training are on-the-job training and classroom training, each used regularly by over 80 per cent of organisations. Respondents to the current survey were therefore asked what forms of training they had received in the past 12 months. The answers are set out in Figure 2, which confirms that classroom and on-the-job training are indeed the most popular techniques, with electronically delivered training being considerably less popular. (The figures come to more than 100 per cent because many respondents had experienced more than one training event over the preceding 12 months.) There was no significant difference between sectors in the use of different practices, but smaller businesses appear to make more use of on-the-job training and less use of classroom and electronically delivered training. Again, there is more about this later.

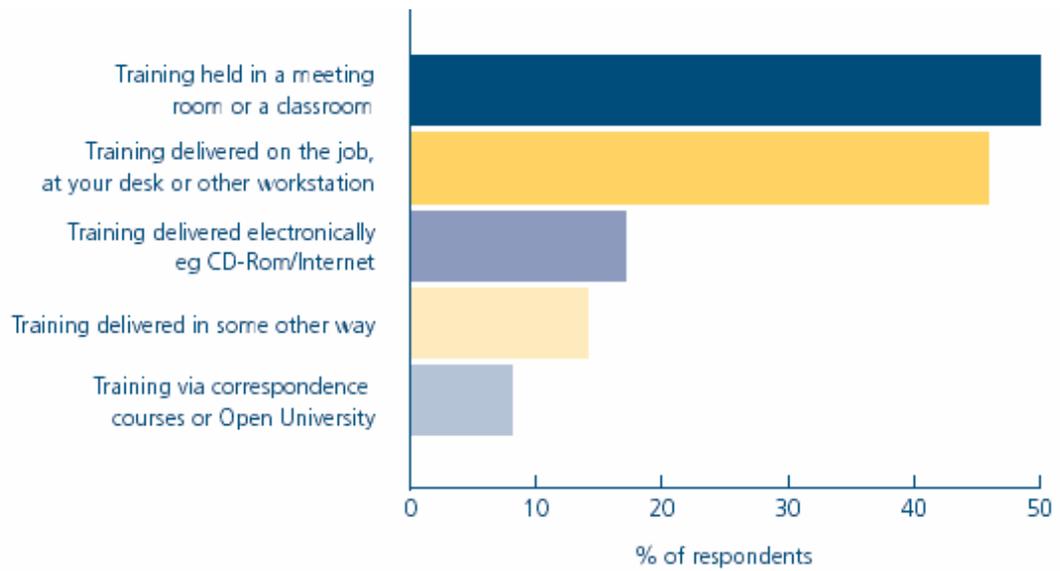


Figure 2: The forms of training received in the past 12 months

Employees are more likely to learn successfully if methods are used which they find appealing. Respondents were therefore asked what the very best and least appealing methods of learning were. The results are set out in Figures 3 and 4 which, unsurprisingly reinforce each other.

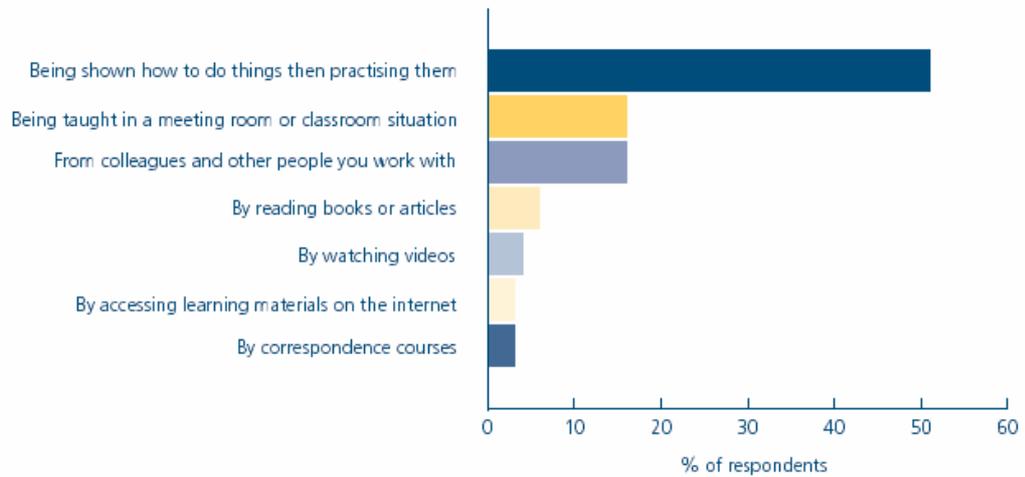


Figure 3: The best method of learning

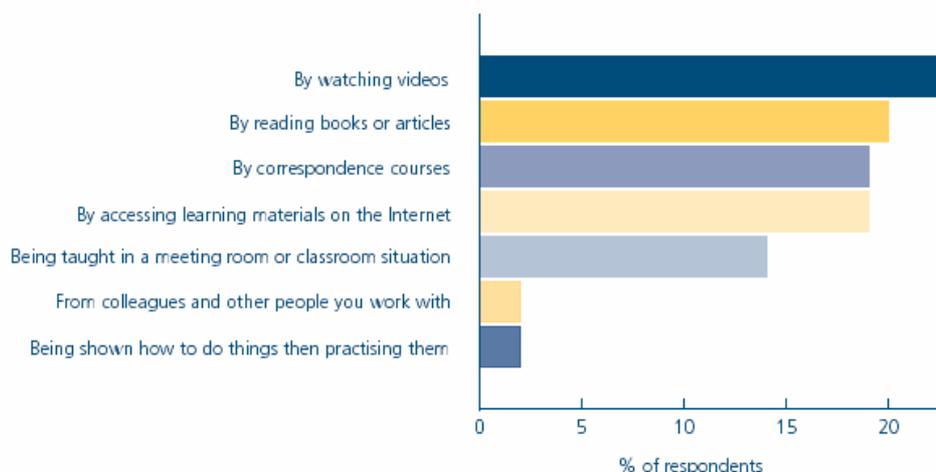


Figure 4: Which method of learning is the least appealing?

6.3 Italy

After a brief introductory part focusing on the European market, we have analysed, through the screening and consulting of the collected informative material and research documents, elements favouring e-learning development in Italy.

We have thus focused on the main market features, in particular the volume and the incidence of market segments development on the total turnover.

Special attention has been given to Italian market trends which show the importance of knowledge and competence store of individuals inside companies and lead to a more structured, complete and efficient offer, oriented to Knowledge Management, also and especially through e-learning.

Research documents elaborated by the most reliable international institutes and recognised Italian associations. In particular:

ANEE (Associazione dei servizi e dei contenuti multimediali) is an association engaged in studying, developing and valuing new information technologies components.

Anee realises a yearly observatory which analyses the multimedia publishing and e-learning market in Italy.

ASSINFORM is the Italian ICT companies' association.

The convergence of Computer, Communication, Content and Consumer Technologies is a top priority for ASSINFORM, which is a major reference point for the Italian ICT industry.

For many years, ASSINFORM has been produced an annual report on the information technology and telecommunications sector that analyses the worldwide and Italian ICT scenarios and provides detailed tables and commentary on data relating to the main product segments and markets. The report is part of a broader range of monitoring activities that enable the Association to offer business and the press quarterly updates with the latest ICT market figures.

6.3.1 Overview of European e-Learning status

In 2001, according to the IDC estimation, the e-learning market volume in Europe reached about US\$ 1 billion: as we can observe in the following figure, the contents component is prevailing and shows the highest increase rate in comparison with services and technological platforms. (Source: Rapporto Assinform sull'informatica e le telecomunicazioni, p. 216).

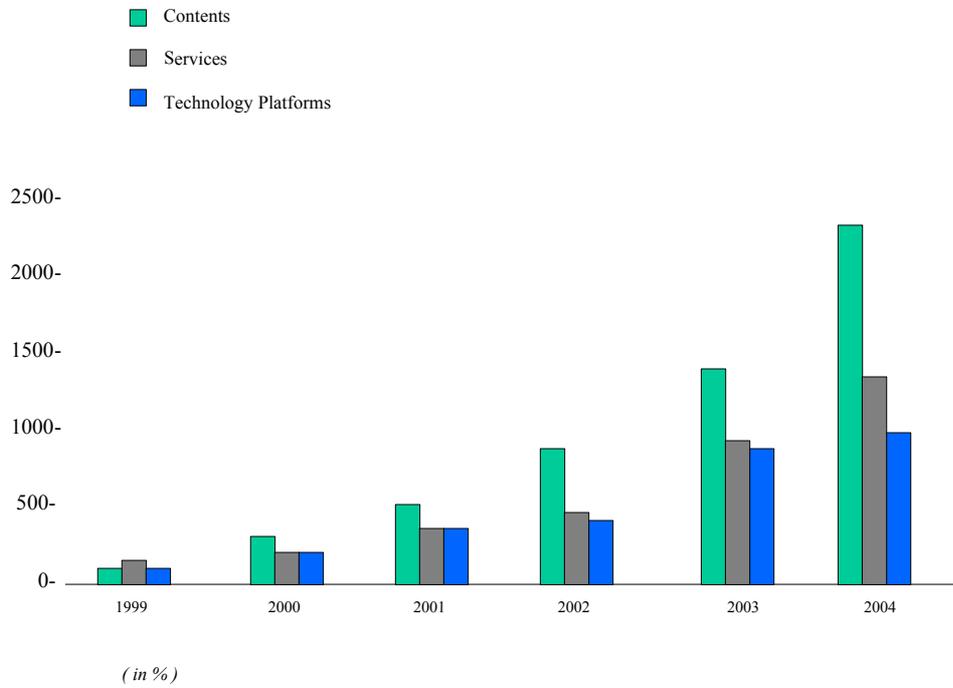


Fig. 1: The e-learning market in Europe 1999 – 2004. Source: IDC in, Rapporto Assinform sull'informatica e le telecomunicazioni 2001, p. 216)

Cedefop (European Centre for the Development of Vocational Training) suggests that the European region spending more time on distance learning is Sweden, while Italy is the second one.

Belgium and France are classified respectively the first and second region as far as the hours for classroom training are concerned. (Source: Rapporto Assinform sull'informatica e le telecomunicazioni, p.).

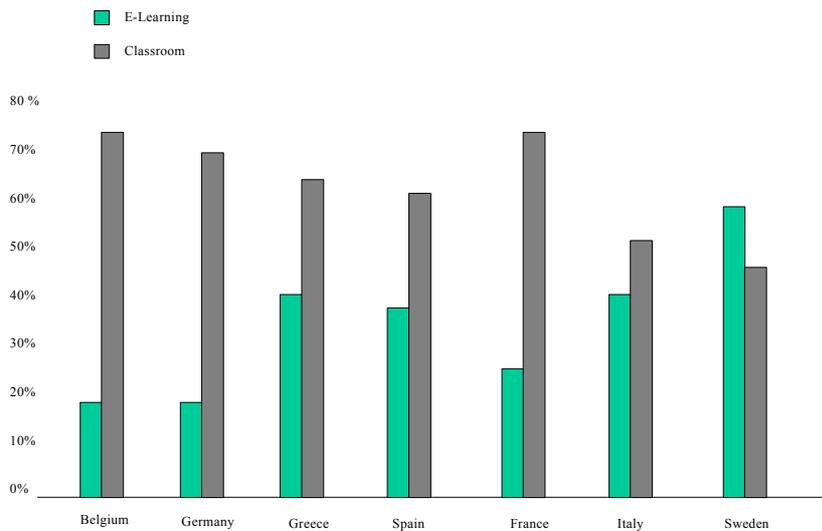


Fig. 2: Time spent on e-learning and classroom training in some European regions 2001. Source: Cedefop, in Rapporto Assinform sull'informatica e le telecomunicazioni 2001, p. 217)

The same survey on e-learning deployment in Europe, conducted at the European level on a sample of public and private institutions' users, shows that 61% of the sample define the global quality of e-learning as almost negative.

Criteria adopted for evaluating the quality have been:

- Optimal technical operation for all users;
- Existence of pedagogical design principles responding to the user's profile;
- State of art content and recent update;
- High level of interactivity.

6.3.2 Italy in the European e-Learning market

Interestingly, the Italian sample has, with regard to UK, Germany, France and Spain, has considered the first criterion as the least relevant. (76% vs. 81,99%).

Only 28% of Italians consider as important the need to link the contents to the job profiles and competences.

Elements favouring e-learning development in Italy

From the IDC surveys and from the results collected by the Anee E-learning Observatory 2001 (Associazione dei servizi e dei contenuti multimediali/Association of multimedia services and contents) emerges that the main factors favouring the e-learning deployment are:

- Substantial reductions in corporate costs;
- Spread of Internet and ICT technologies;
- Easy access to connection and bandwidth, connections via satellite;

- Compatibility between technological systems and streaming video quality;
- Increasing demand for blended solutions, characterised by traditional training activity with distance training processes according to e-learning modality;
- Wider development of offers in outsourcing and ASP.

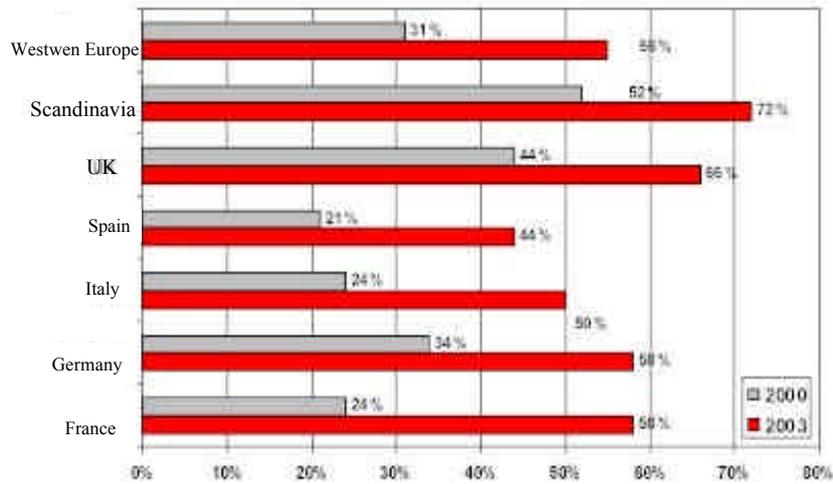


Fig. 3: Development of Internet in Italy with regard to other European regions. Source: Elito in Anee e-learning Observatory 2001, p. 22)

Figure 3 shows that UK, Germany and France play a central role. It has been anticipated, however, that Italy is going to be close to the European average by 2003.

The growth is guaranteed by the fact a significant number of Italian companies (especially the top-medium ones, with over 100 employees) already use an Internet connection .

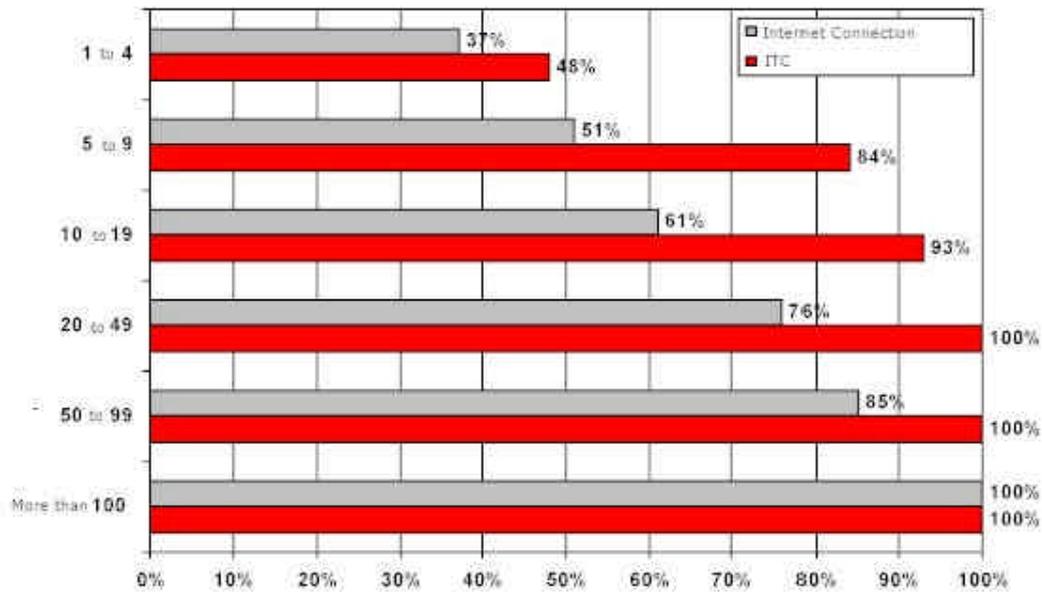


Fig. 4: Companies connected to Internet by size. Source: Osservatorio Anee: E-Learning 2001, p. 24)

The chart clearly shows that Italian Public Administrations, already making use of ICT, are quickly turning to an Internet total connection; it is assumed that it is in this sector that the most significant extension of e-learning programs will occur.

6.3.3 Italian E-Learning Market

ASSINFORM Survey

According to Assinform, the Italian e-learning market will undergo significant growth, with consolidation on the demand side and restructuring on the supply side. Over the last few years, partnerships between e-learning platforms infrastructures, services and contents providers have been rising. The data from Assinform and NetConsulting data is unambiguous : the Italian market value has increased by 86,7%, in the period from 2000 to 2001 (Assinform gives also a quite open definition of e-learning that might explain why figures are higher for Italy than UK).

IDC Survey

According to IDC surveys the Italian e-learning market is facing a substantial growth. According to the April 2002 survey, the Italian market value rose from 19 M€ in 2000 to 29 M€ in 2001; the forecasted values for 2006 is 297 M€ ...

The growth rate in Italy (59%) is therefore the highest in Europe. This rate would lead Italy to rank fourth in Europe, after Germany, the UK and France, with regard to corporate investment for deployment of e-learning in 2006 .

Italian market trends

Since the end of 2000, in Italy the term 'e-learning' started assuming a wider meaning, supported by new values, in particular, the need to spread and make accessible to all the knowledge, and the need to pay special attention, enhance and promote people competencies which represent a real corporate asset.

In this context e-learning assumes vital importance, offering companies the opportunity to implement lifelong learning systems.

Anee Observatory's survey also outlines the growth of the potential market volume in the context of B2C (Business to Consumer) in addition to B2B (Business to Business). B2C is gaining ground and importance, although large companies and training and consulting organizations have traditionally given little attention to it.

Italian companies are shifting to more "extended" management models, able to optimise the information flows, by ensuring that the information is spread to the largest number of users, thereby guaranteeing a personalised access to real time information.

These main objectives can be reached through an information "self-service" management, where users play a central role in inserting, updating and recovering data, without the constant support of IT staff.

Enterprise Portals represent for companies a suitable solution in order to spread and share knowledge, leading to applicative integration and B2B solutions.

The following figure shows an enterprise portal model represented as an entry point, integrating information and applications coming from inside and outside the corporation. (Source: Rapporto Assinform sull'informatica e le telecomunicazioni 2001, p. 204)

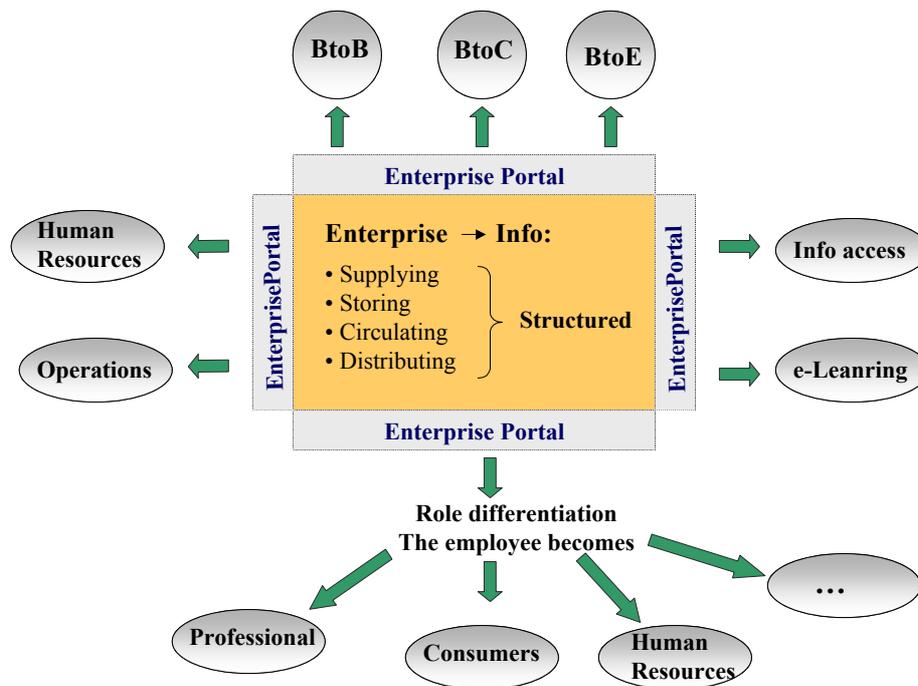


Fig. 5: Corporate informative flows and enterprise portal role. Source: Assinform/netConsulting in Rapporto Assinform sull'informatica e le telecomunicazioni 2001, p. 204)

Such an enterprise portal improves the quality of information, ensures its full ubiquity and sharing, translating it into a dynamic and corporate cross flow. Benefits are evident:

- Consistent time saving in the information search process;
- Greater homogeneity of the information produced ;
- Collaboration and cooperation increase, inside and outside the company.

The significant evolutionary change will be launched through the full convergence of e-learning, Knowledge Management and Content Management, within an enterprise portal. (Source: Rapporto Assinform sull'informatica e le telecomunicazioni 2001, p. 212)

Market Volume

According to Anee e-learning Observatory, in 2003, the e-learning market development is going to show a 148% growth over the previous year. This growth is due to a series of factors:

- Greater presence of e-learning paths in schools and universities;
- Entry of foreign companies, who are going to create subsidiary and branches, and therefore, bill in Italy, adding value to the market;
- Significant shift for any companies involved in traditional training to on-line courses

Contents as a winning strategy segment

The two following charts illustrate that content are will bet the market segment generating the highest turnover.

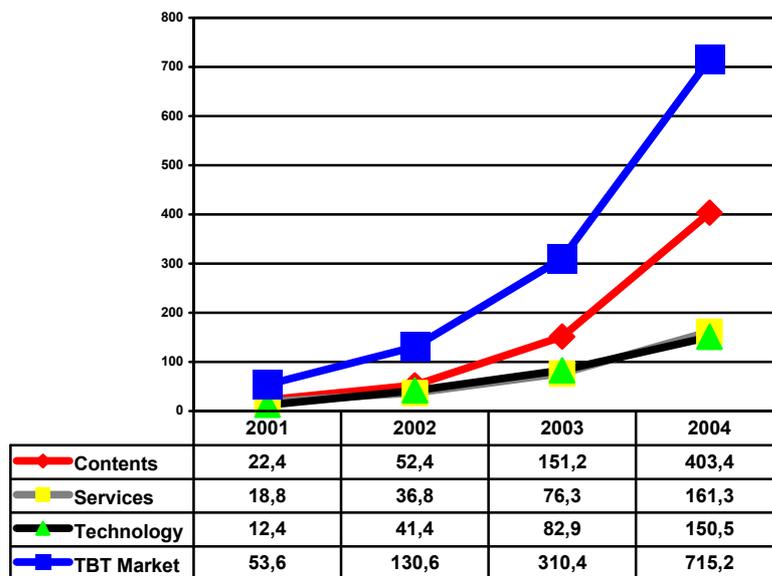


Fig. 6: Strategy segments growth of TBT market. Source: Anee Observatory e-learning 2001, p. 42)

Despite a slight downturn in 2002, it is anticipated that, by 2004, content will be the sector showing the most significant investment by Italian companies.

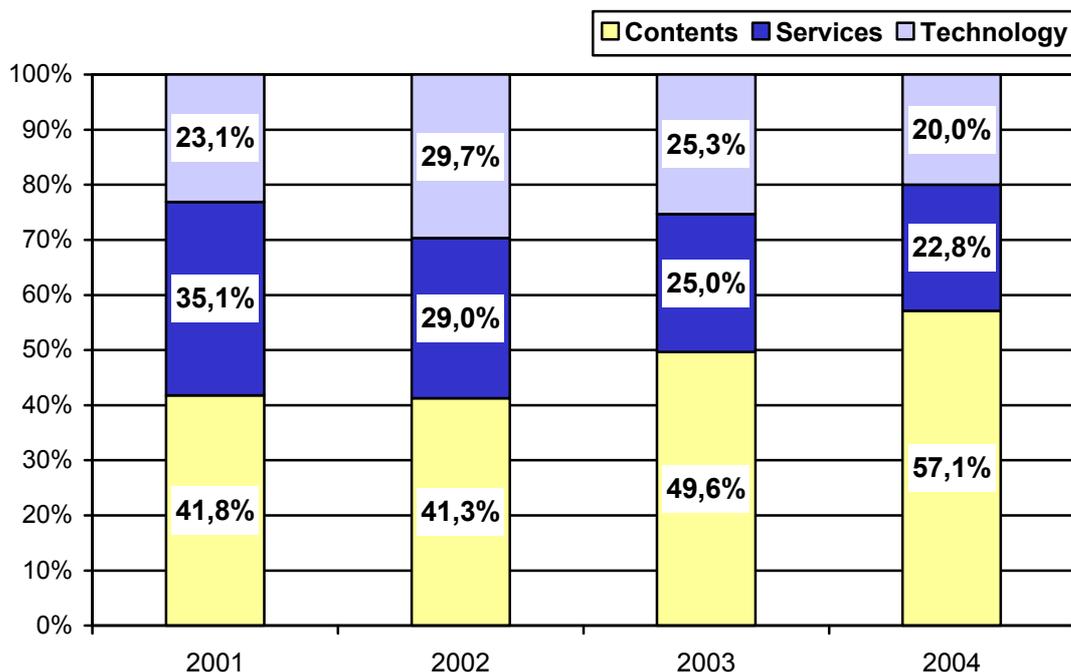


Fig. 7: Market segments development and their incidence on the total turnover Source: Anee e-learning Observatory 2001, p. 43)

Chart n.7 also clearly displays the incidence of technology, services, and content on the e-learning Italian market development:

- In 2004, technology will cover only 20% of the turnover, probably due to the fact that in previous years, substantial investments on ICT have been made;
- The share for services will be lower than 30% on the total turnover;
- Content will be the main market segment, covering more than 57% of the total turnover in 2004.

6.3.4 Italian e-Learning Demand

According to the surveys conducted by important international research institutes, the largest share of companies making use of e-learning paths operate in the ICT sector (31%), followed by banking companies (28,5%), by educational institutions (12,5%) and by Public Administration departments (9%).

In Italy, the percentage of hours devoted to delivering e-learning training paths will grow to 15% by 2003 and will reach 33% by 2005. (Source: Rapporto Assinform sull'informatica e le telecomunicazioni 2001, p. 214).

Anee e-learning laboratory, in the following chart, shows that the demand from public administration and companies represents 82% of the market volume, in comparison, with 11% for schools and universities, and only 7% for private customers.

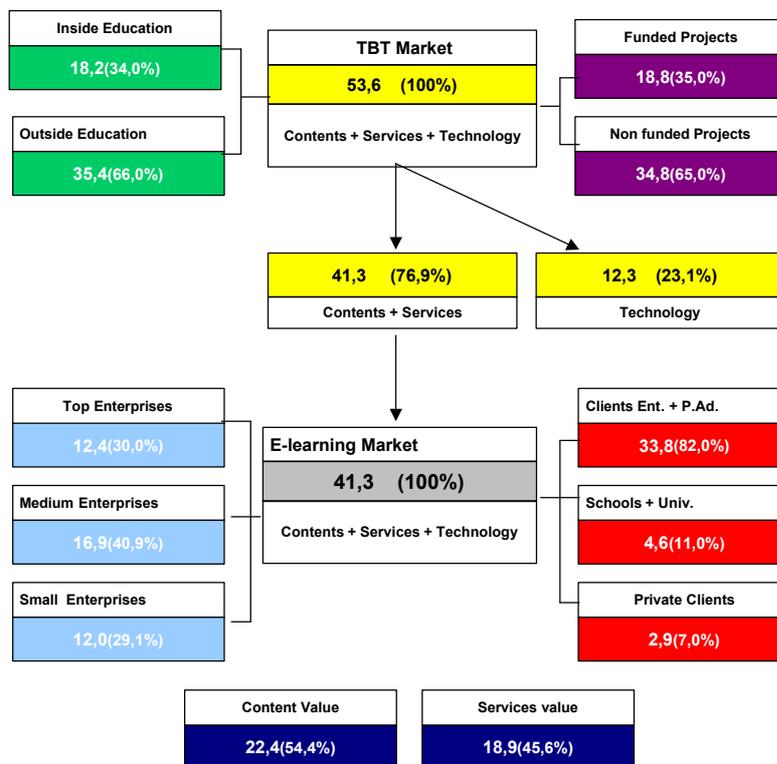


Fig. 8: Structure of 2001 aggregated market value (TBT) and e-learning (Million €). Source: Anee: e-learning Observatory 2001)

6.3.5 Italian e-learning Offer

The above chart also shows data related to provider companies, in particular: in 2001, top companies accounted for 30% of the market value, medium companies, for 40,9%, and small companies for 29,1%. Top and medium companies have accounted for more than 70% of the market value. (Source: Anee: e-learning Laboratory 2001, p. 48). However, the offer still concentrates on the content and services segment.

The content sector, in particular the sector integrating contents and services will be the strategic segment, as it has registered the highest turnover: 2001 saw the first joint ventures between service providers and large offers for the joint offer of contents, services and technology infrastructures.

In 2001, a number of top e-learning companies (especially from the US) have decided to enter the Italian market, by establishing their own branch. (Source: Rapporto Assinform sull'informatica e le telecomunicazioni 2001, pg. 217).

An important aspect, that many providers clearly see as a new market opportunity, concerns the integration of training through e-learning with knowledge management operations inside the company.

The following figure illustrates how the synergy between e-learning and e knowledge management is possible, with the vision of an investment framework on a company's human resources:

Features Common to e-learning and Knowledge Management

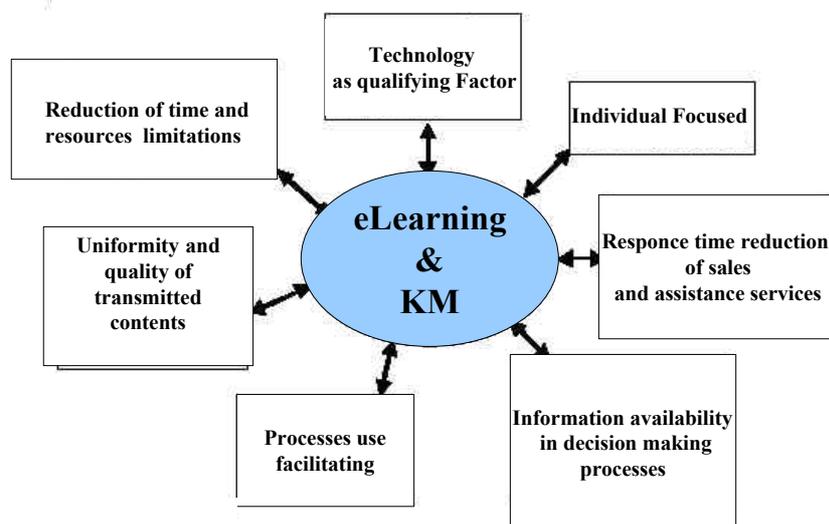


Fig. 9: Features common to e-learning and Knowledge Management. Source: “Studio Corporate e-Learning e Knowledge Management in Italia”, April 2002).

Such a system would produce enormous advantages and benefits for Italian companies, in terms of upgrade of learning environment, in addition to the immediate and direct creation of contents, that would lead to optimising the company’s operational management, through consistent cost saving. (Source: Patano, Dose, Vaciago, “Studio Corporate e-Learning e Knowledge Management in Italia”, April 2002)

E-learning is not simply a set of lessons broadcasted via the Internet or on a corporate Intranet, integrated with chats, forums, CD Roms, Web Communities, etc.

For Italian companies, today, e-learning represents a more complex process: the ICT impact on didactic/training environment, able to promote cultural and cognitive changes generating a deep change in representing, communicating and organising the knowledge system at different and integrated levels.

Italian organisations, indeed, find in e-learning a new training model able to transform and adapt the organisational culture to facing different scenarios (such as Knowledge Process and Re-Engineering).

6.3.6 Italian e-Learning Market Recipients 2002/2003

The surveys on the Italian e-learning market conducted by Anee Observatory show that corporate financial resources invested in training and refreshing courses are going to increase in the two-year period 2002/2003.

Three companies out of four would like to implement e-learning programs by the end of 2003.

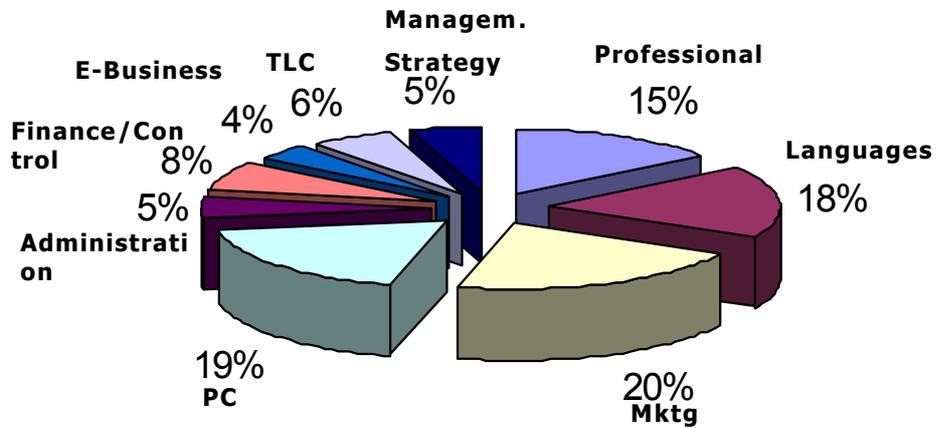


Fig. 10: Training Areas, investments allocation 2002/2003. Source: Anee e-learning Observatory 2001, p. 70)

This chart shows the training areas which are going to be mainly developed through e-learning paths, in comparison with 2001:

- the professional area is going to decrease by about 30%;
- Marketing and Languages, on the opposite, will undergo a substantial increase

Thus, investments on content which require a greater interaction and attention to services will increase.

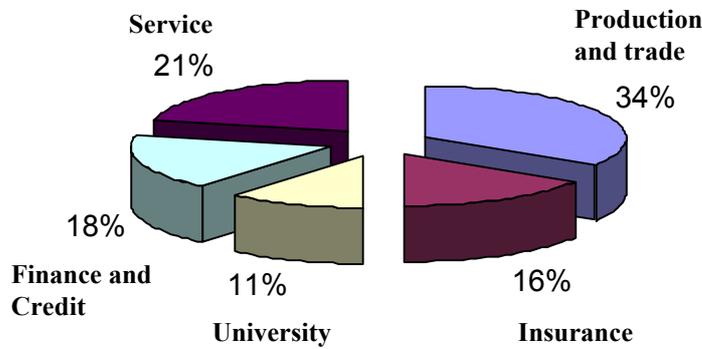


Fig. 11: Corporate segments which are going to adopt e-learning. Source: Anee e-learning Laboratory 2001, p. 72)

Among companies which intend to adopt and implement e-learning, in the short and medium range, top and medium companies operating in the production and commerce sectors, as well as service companies will be very much involved.

Within interested companies, Anee identifies recipients considered particularly inclined to make use of e-learning paths:

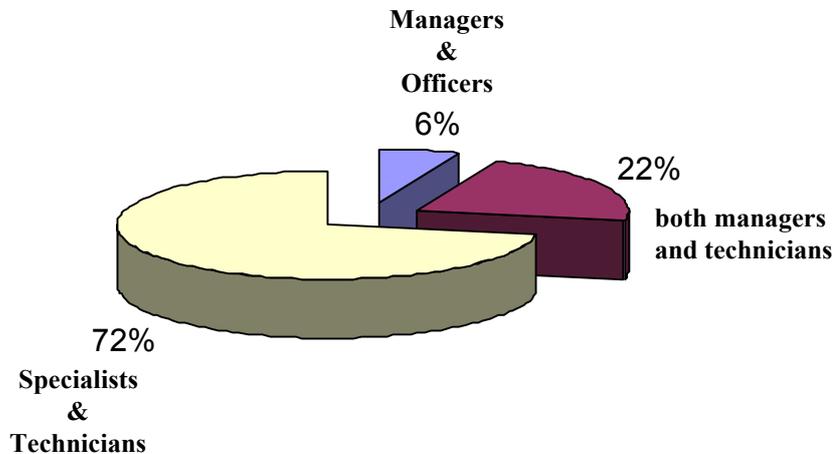


Fig. 12: Recipients considered more inclined to use e-learning. Source: Osservatorio Anee e-learning 2001, pg. 72)

70% of the sample interviewed by Anee Observatory believe that e-learning is more apt to be used in order to develop technical/specialist topics, while only a small percentage maintains that e-learning can be applied to more complex cultural subjects.

Interviewed companies maintain that traditional training and refreshing paths should be addressed to managers and officers as more space is dedicated to experience exchange rather than to theoretical or practical knowledge.

The segment of corporate workforce considered especially apt to make use of e-learning paths continues to be represented by specialists and technicians, for over 70% of the interviewed sample. (Source: Anee e-learning Observatory 2001, p. 72)

6.4 France

It is important to bear in mind that the needs of training within companies are growing. This is what 80% of the interviewees in the Cegos study said in 2002, compared with 65% in 2000. As in 2001, for over 95% of the interviewees, one of the major issues for training in their company remains the management of competence. Almost three quarters of those polled agree that employees have less and less time to devote to training and 42% think that recently hired employees need more and more, in order to be brought up to the corporate standard. Thus, the fractions who totally deny the idea of e-learning is decreasing from 28% to 12% this shows that people are aware of the inescapable nature of e-learning.

A brief description of the e-learning market potential:

According to a December 2000 study carried out by Rhinfo, the e-learning market should grow by 41,7 % during the next five years and reach 244 M€ . May 2001 estimates indicate

that this market should grow by 40 % a year and represent 2,2 % of the expenses concerning further training.

In the long term, the Internet should represent 70% to 80% of the further training market, according to La Tribune.

The study carried out by Arthur Andersen Consulting and published in the first semester 2001 revealed that 60% of the 74 polled companies say that they have already resorted to e-learning.

According to IDC's 1999 estimates, the French e-learning market (including CD-ROMS, intranet and internet e-learning services) should reach 244 M€ in 2004, more than doubling its size between 2001 and 2004:

	1998	1999	2000	2001	2002	2003	2004
French eLearning market (M€)	24	44	72	107	149	194	244

Source: IDC, 1999

Given that France follows the American trend with a two year lag, segmentation between technical architecture and content can be expected to be the following:

M€	1998	1999	2000	2001	2002	2003	2004
Content	15	26	42	60	83	104	122
Infrastructure	10	18	31	46	67	91	122

Source: IDC, Morgan Keegan, our estimates

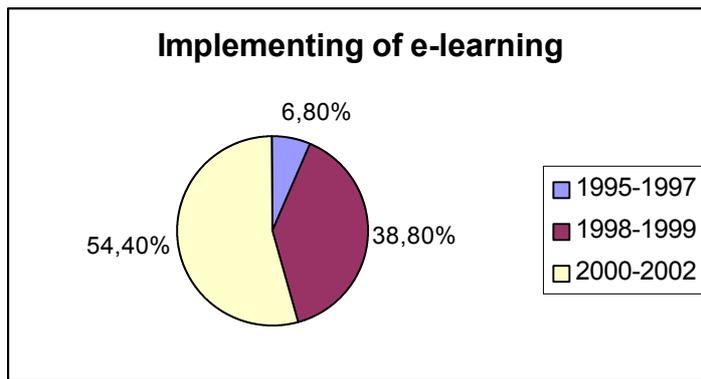
The Internet remains a limited source for e-learning solutions, as only 31% of French companies use it for e-learning purposes, whereas the Intranet is used by more than half of companies. Once dominant, the CD-ROM has reached a plateau in 2002:

	2000	2001	2002
CD-ROM	30%	52%	52%
Intranet	22%	31%	56%
Internet	11%	11%	31%

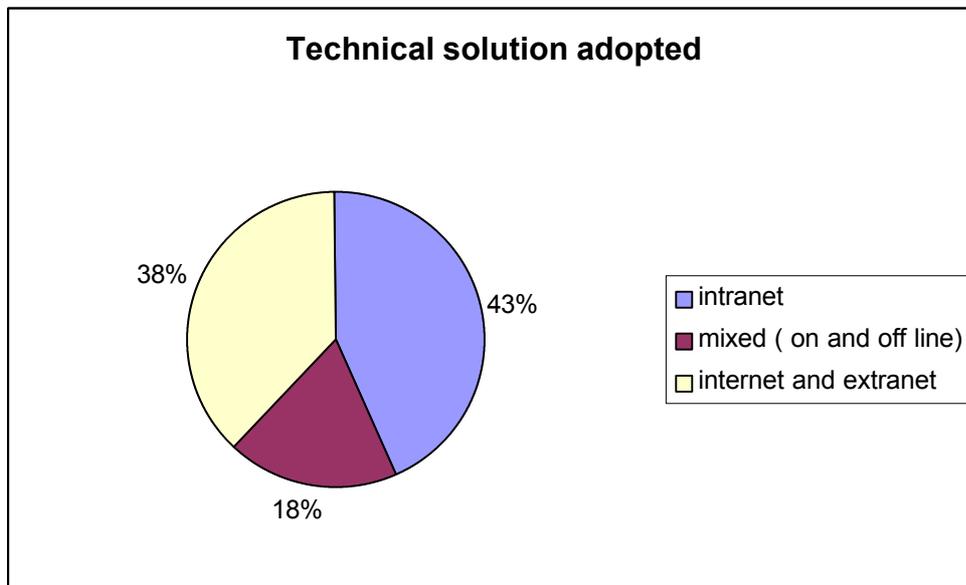
Once implemented, e-learning solutions have the following content:

IT	Job specific	Languages	Other	Management	Sales	Behaviour
49%	46%	40%	17%	9%	9%	3%

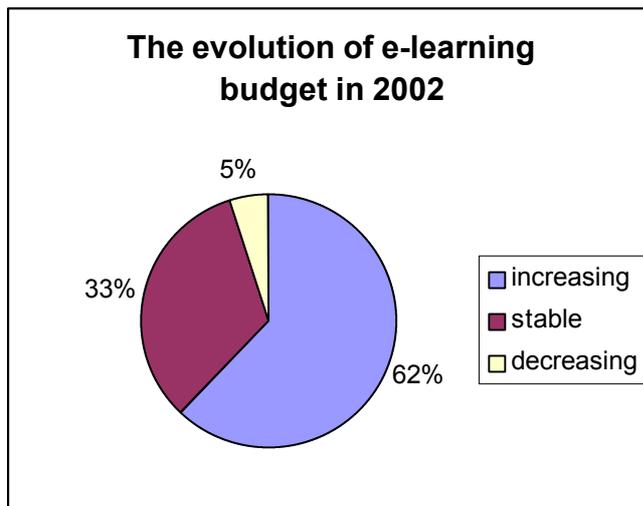
The following charts and graphs are excerpts from the study "Entreprises et la e-formation en France enquête 2002."



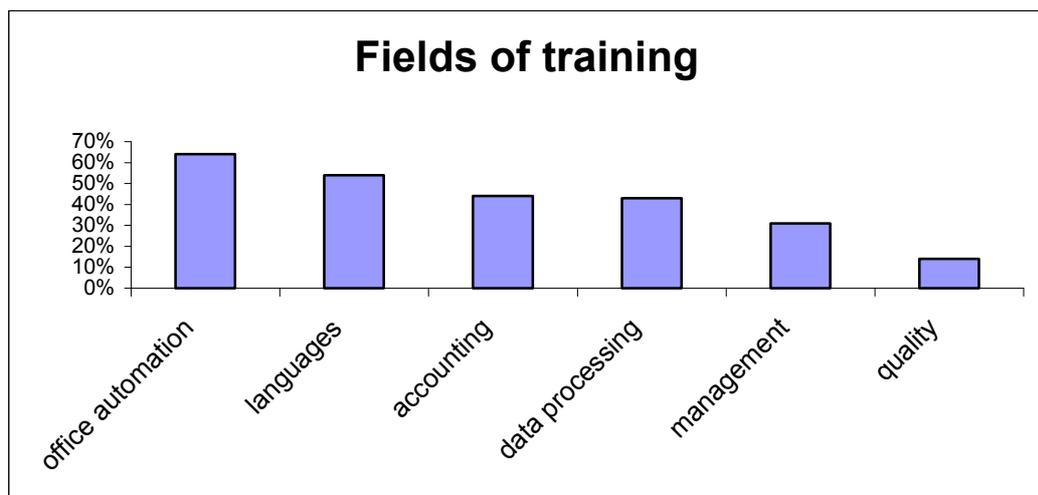
Implementing e-learning within companies is quite a recent phenomenon and has developed strongly since 1999. Only 6,8 % of companies were using this method before 1998, and in 2000, this percentage had risen to 54.4%. In 2002, 46 % of companies have trained more than 200 employees, versus 29 % in 2001.



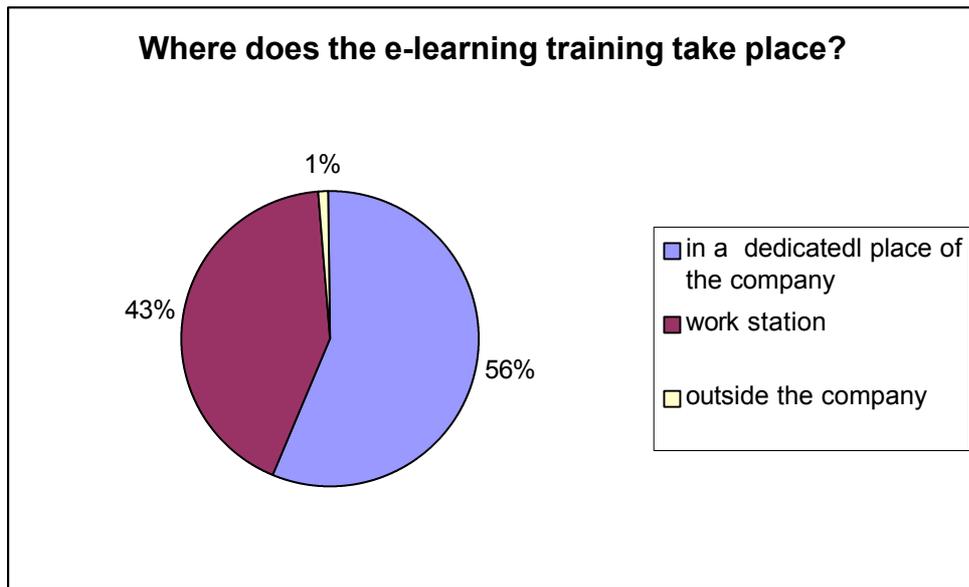
The Intranet is still the first technical solution used by companies. Resorting to the Intranet appeared as a solution in 1999 and has been developed since this period. However the mixed system (on and off line) is steadily growing. These systems are especially used by companies with less than 200 employees. The decrease of Internet and extranet as a solution for e-learning is about 5% between 2001 and 2002.



Only 5% of those polled consider that their budget allocated to e-learning has decreased since last year. The proportion of companies disappointed with e-learning is thus very low. This phenomenon is strengthened by the fact that companies do not want to lag behind and to lose competitiveness.

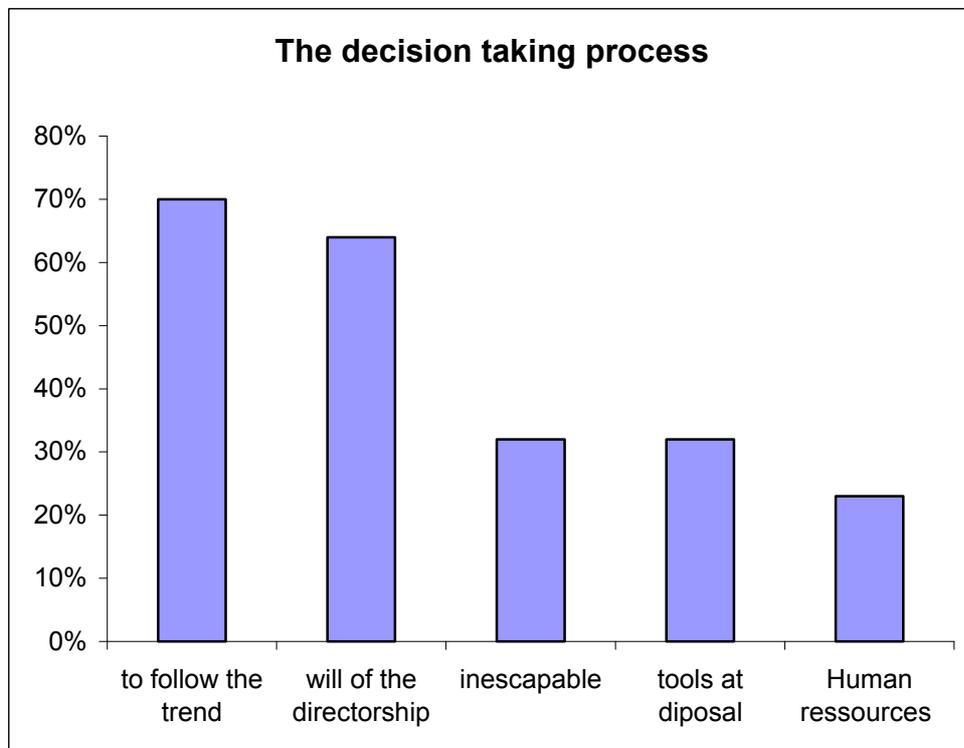


e-learning is especially used for easily transferable knowledge, in fields such as office automation, foreign languages and data processing. However, it is penetrating new fields : for example quality, security and environment. Other sectors such as accounting and management take advantage of these new technologies. e-learning use is stable for training linked to trade.



Companies increasingly use the tutorial system (82% in 2002 compared to 70 % in 2001). Differences appear when considering the size of the companies. Only half of those employing 200 to 499 employees resort to the tutorial system.

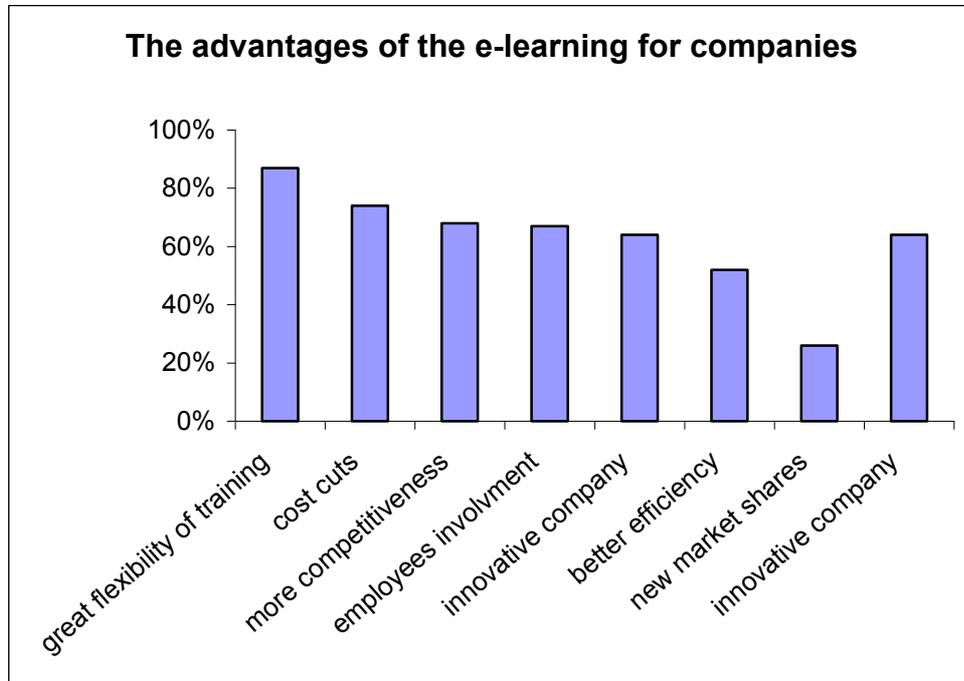
In the overwhelming majority, training is given within the company whether on the workstation or in a dedicated location of the company. But in smaller structures (less than 200 employees) it rather takes place outside the company. Compared to last year, training takes place more on the workstation.



As a general rule, companies decided to resort to e-learning in order to follow the trend or to respect the will of the executive management. However the type of answer depends on the

date of launch for the e-learning projects. Companies which implemented e-learning early developed their own tools

Decision makers are either with the Human Resources Department (for 48% of companies) or with the executive management (for 41% of companies) .



The reasons why companies resorted to the e-learning before 1998 were the implementation of new technologies and increased efficiency. Since 2000, the major reasons are the greater involvement of employees within the company and the increased competitiveness e-learning brings.

6.5 Germany

As the figure below shows, fewer than half of the large-scale companies in Germany are currently using e-learning to further develop the knowledge of their employees. 11 % are planning to deploy new media for training purposes shortly, 18 % are considering e-learning but haven't come to a clear decision so far.

Deployment of E-Learning in Corporate Training (Germany)

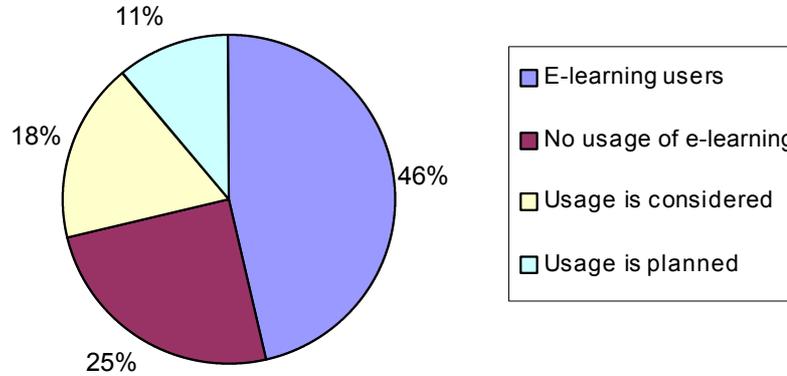
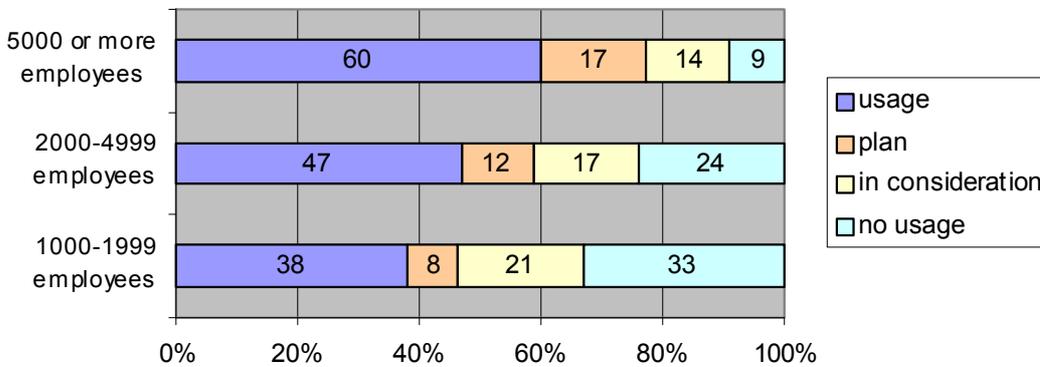


Figure 6: Deployment of E-Learning in Corporate Training (source: KPMG 2001, p. 13) (n=604 German large-scale enterprises)

The 29% of the German companies that intend to implement e-learning are an interesting reference point, to estimate the short and mid-term future development of this market

Deployment of E-Learning by Size of Company



segment. The actual e-learning share of a company's corporate training clearly depends on the size of the company as well as the line of business.

Figure 7: Deployment of E-Learning by Size of Company (source: KPMG 2001, p. 13) (n=604 German large scale companies)

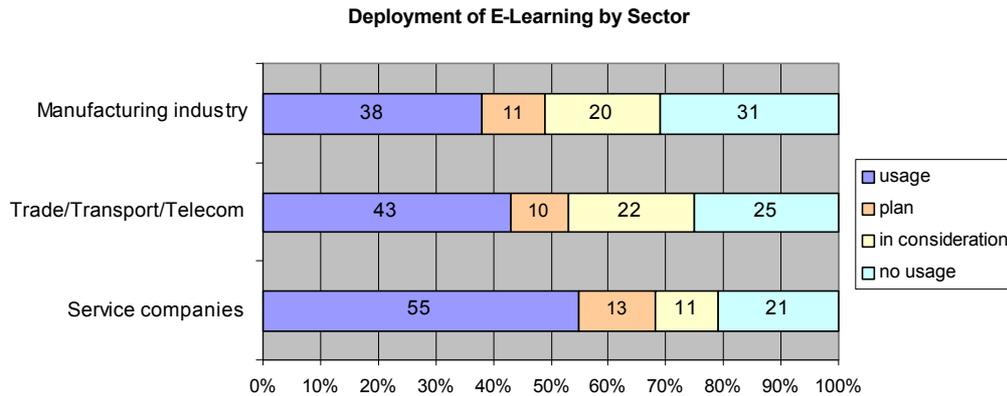


Figure 8: Deployment of E-Learning by Size of Company (source: KPMG 2001, p. 13) (n=604 German large scale companies)

The largest share of companies making use of e-learning can be found within the service sector (55%), among which, banking and insurance companies, especially, have already implemented e-learning technologies to a very large extent (68%) (KPMG 2001, p. 13). Other lines of industry are facing the challenge to catch up with these developments, therefore also including a broad potential customer base of large companies and conglomerates that preferably could be addressed for the purpose of electronically supporting the exchange of learning/knowledge resources.

The following chart illustrates the upward tendency of e-learning over the years and (together with the above mentioned figures) also suggests a further increase within the upcoming years.

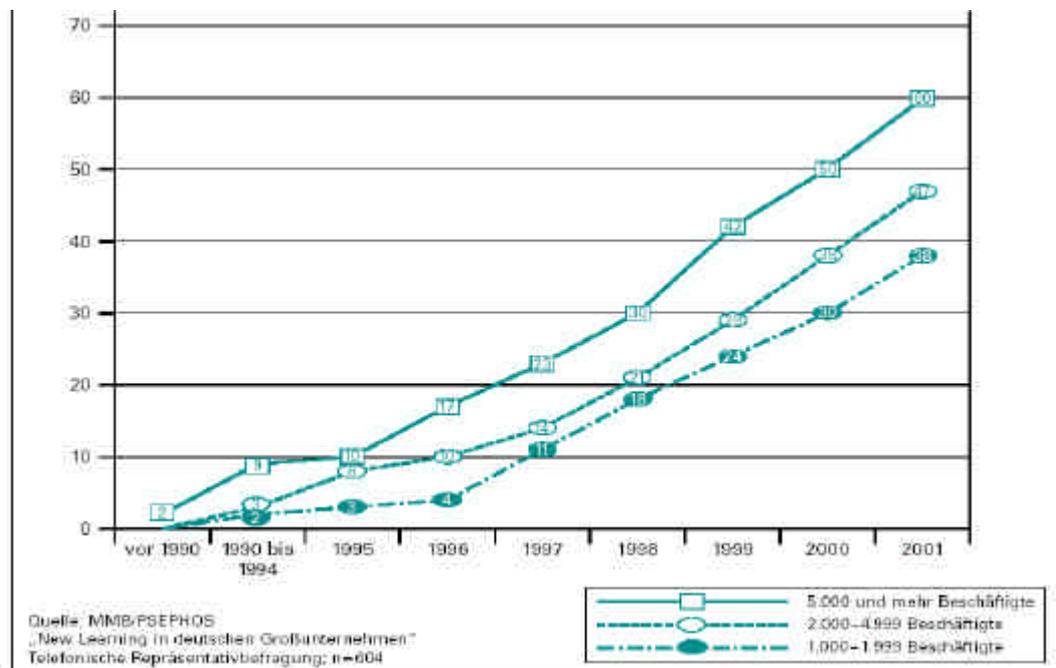


Figure 9: Deployment of e-Learning over Time (in %) (source: KPMG 2001, p 14) (n=604)

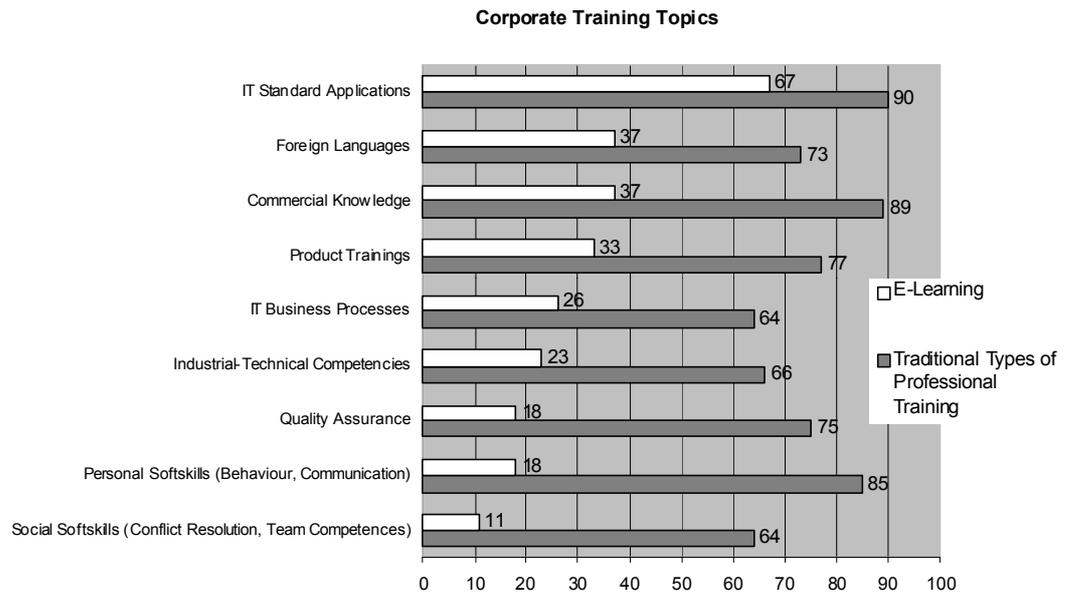


Figure 11: Topics Taught in German Corporate Training (in %) (source: KPMG 2001) (n=604 German large scale enterprises)

The above figures show the subject areas that are preferred topics offered via e-learning. Most e-learning efforts are dedicated to subjects like IT, foreign languages, commercial and product knowledge, thus representing massive content resources that need to be addressed, for high quality knowledge exchange and sharing.

Generally, apart from e-learning, the most important knowledge areas that can be found within the interviewed companies (60-90%) are - ranked by importance - the following (KPMG 2001, p. 5): Personal Softskills (behavioural and communicative competence), IT Standard Applications, Social Softskills (conflict resolution, team competences), Product Trainings, Commercial Knowledge, Technical Competences, Foreign Languages, Quality Assurance, IT Business Processes. Personal and social softskills, especially, are barely addressed by the usage of e-learning technologies; but as they are very important in business settings, a substantial part of financial resources are allocated to the development of softskills (26 %, according to KPMG 2001,); it will be likely to increase, particularly in the form of blended learning.

The chart below shows estimates of Berlecon Research for the development of the German e-learning market. An optimistic approach forecasts a total market volume of more than 2,000 M€, while the more conservative outlook estimates a volume of around 1,500 M€, which still represents a substantial growth rate.

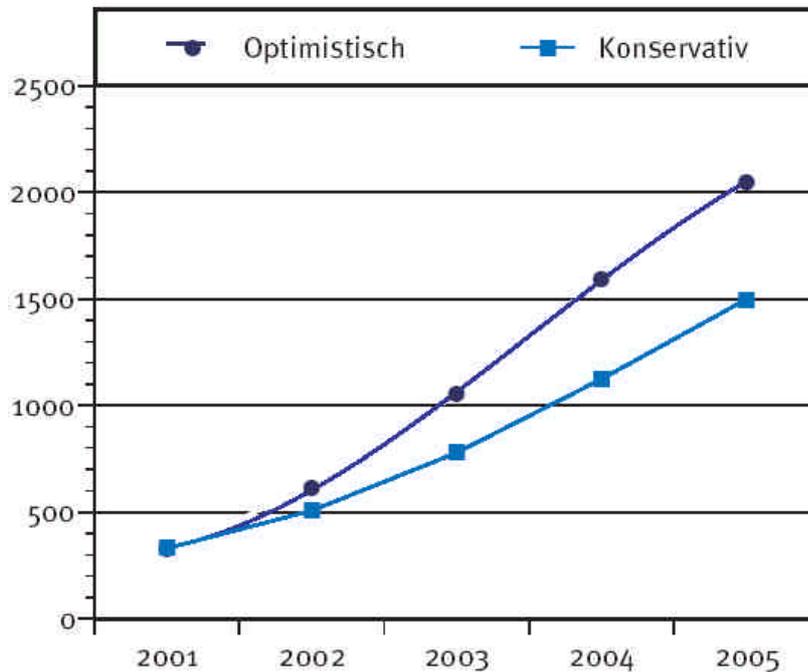


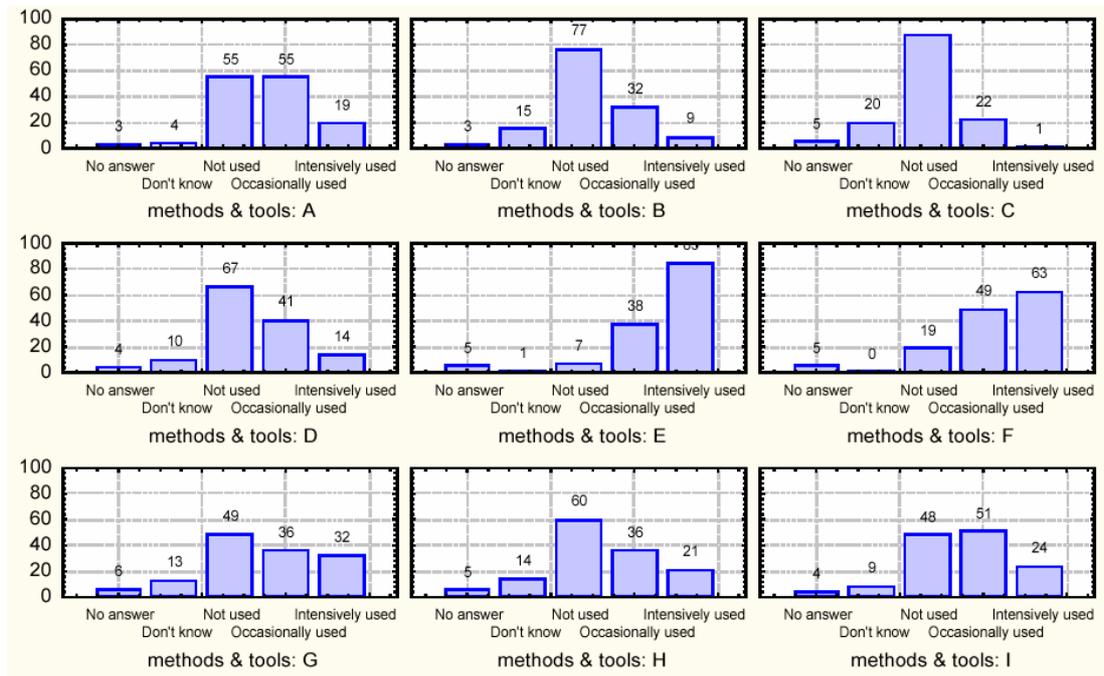
Figure 12: E-Learning Market Volume in Germany – Optimistic and Conservative Projection for 2001-2005) (million €) (source: Berlecon 2001)

In the course of the project CORONET (Corporate Software Engineering Knowledge Networks for Improved Training of the Work Force), which is a European Union funded project (No. IST-1999-11634), a market survey of the German eLearning market in the Information Technology and Software Engineering domain was conducted. This report presents the major findings of the explorative study. A total of 3.400 German IT companies was asked to describe their usage of, demand for, and benefits seen in methods and tools for (A) web-based training, (B) web-based tutoring, (C) web-based mentoring, (D) web-based cooperative learning and problem solving, (E) web-based knowledge search, (F), web-based access to expert knowledge, (G) generation of web-based knowledge structures, (H) visualization of web-based knowledge structures and contents, (I) development and maintenance of web-based competence networks.

Current Usage of Methods and Tools for eLearning. The examination of the current usage situation of methods and tools for eLearning shows that most companies (more than 70%) use the methods and tools of the previously specified categories not at all or only occasionally.

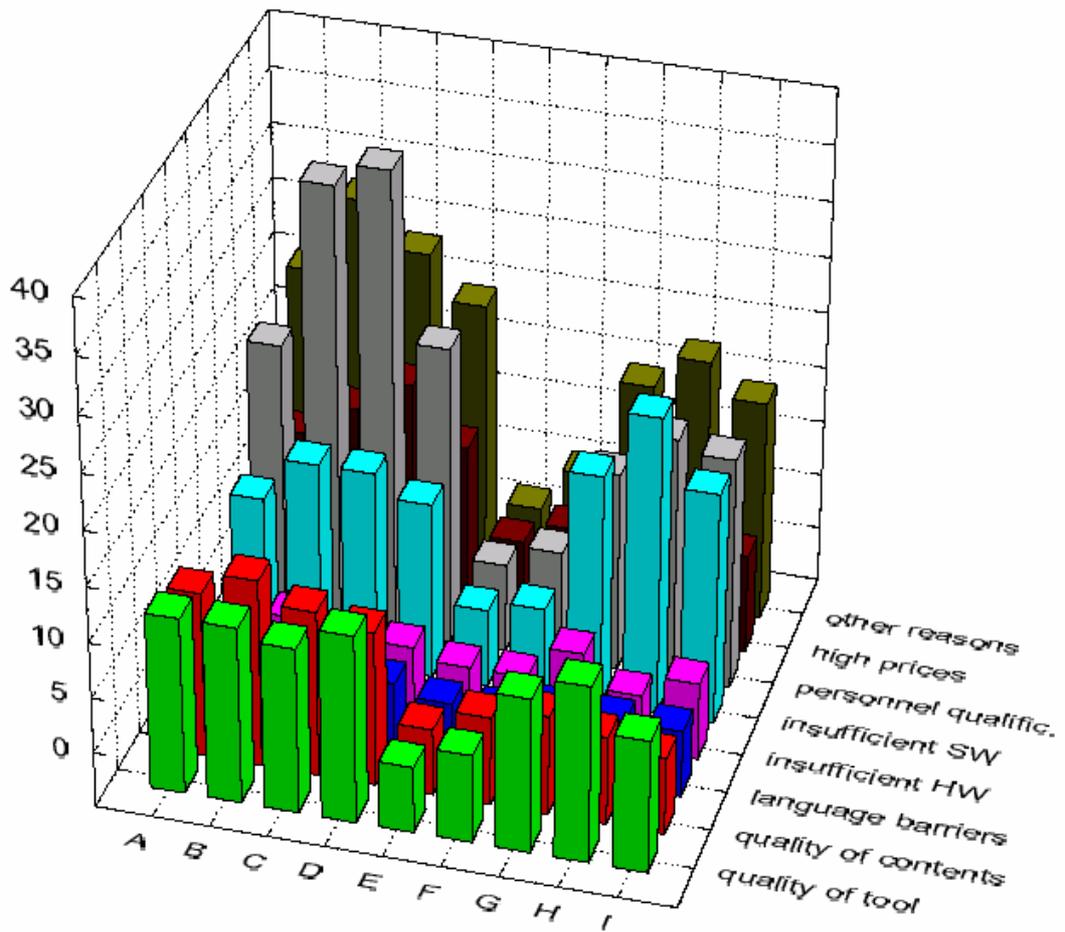


Breaking down the various categories of methods and tools for eLearning shows that web-based knowledge search (E) and web-based access to expert knowledge (F) are currently the methods and tools that are in the lead regarding their respective usage, whereas web-based tutoring (B), web-based mentoring (C), and web-based cooperative learning and problem solving (D) are almost not used at all. The remaining methods and tools show a mixed situation of no usage, occasional and intensive usage.



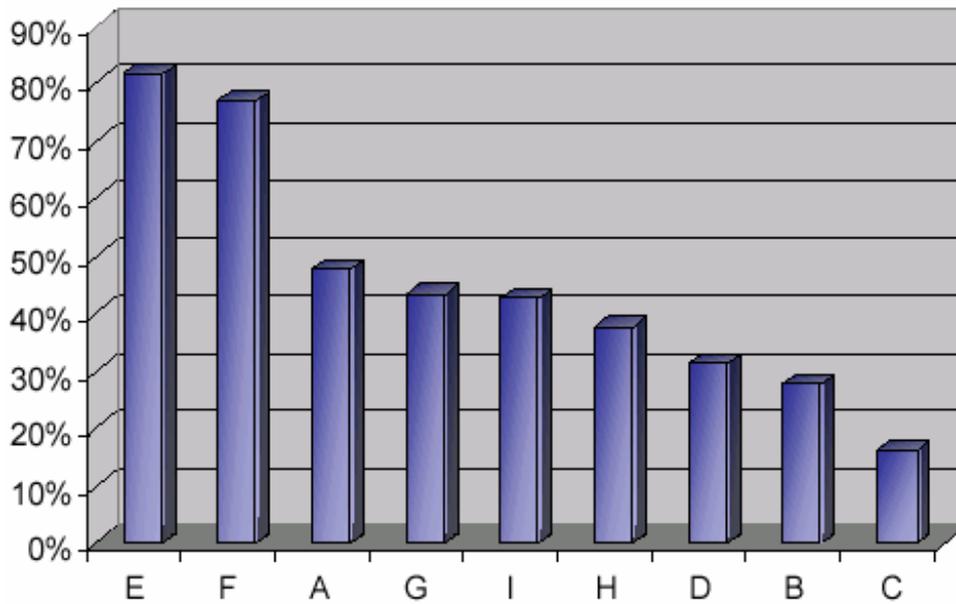
The Top 5 reasons for not using methods and tools of the specified functionalities given by the respondents were:

- (1) the personnel does not have adequate qualification for e-learning-related tasks
- (2) the offered or existing software is deemed to be inadequate
- (3) the overall quality of tools is seen as unsatisfactory
- (4) existing tools are too expensive
- (5) the quality of content is often seen to be inadequate to meet specific needs



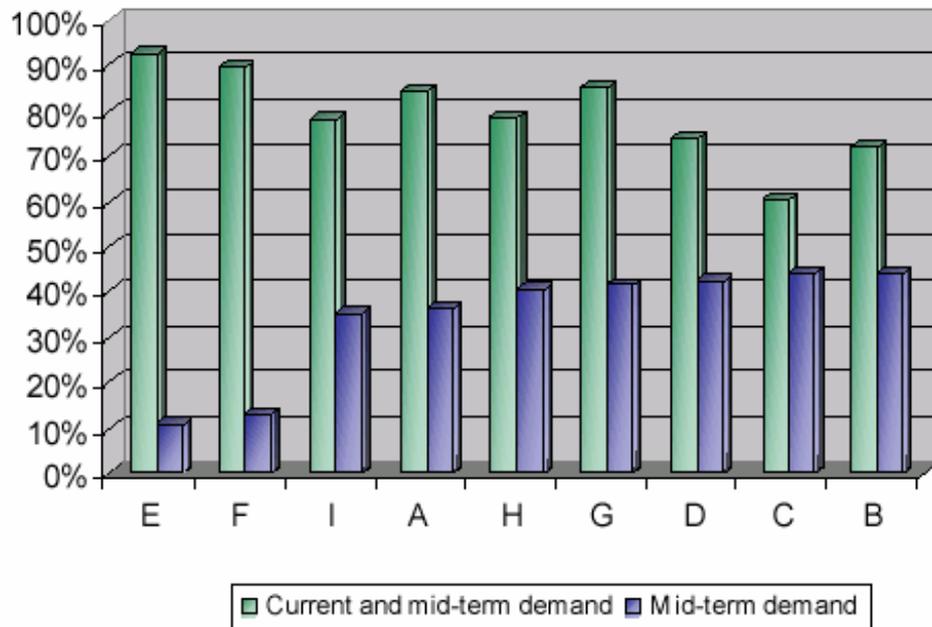
e-learning Market Potential. Generally seen, the e-learning market potential including the surveyed categories of methods and tools promises to be high. Today, there is a high demand (more than 70% of the surveyed companies) for methods and tools for web-based search of knowledge (E) and web-based access to expert knowledge (F). For the other categories of methods and tools for e-learning (A-D, G-I), 50% and less of the companies saw an immediate need.

Current demand



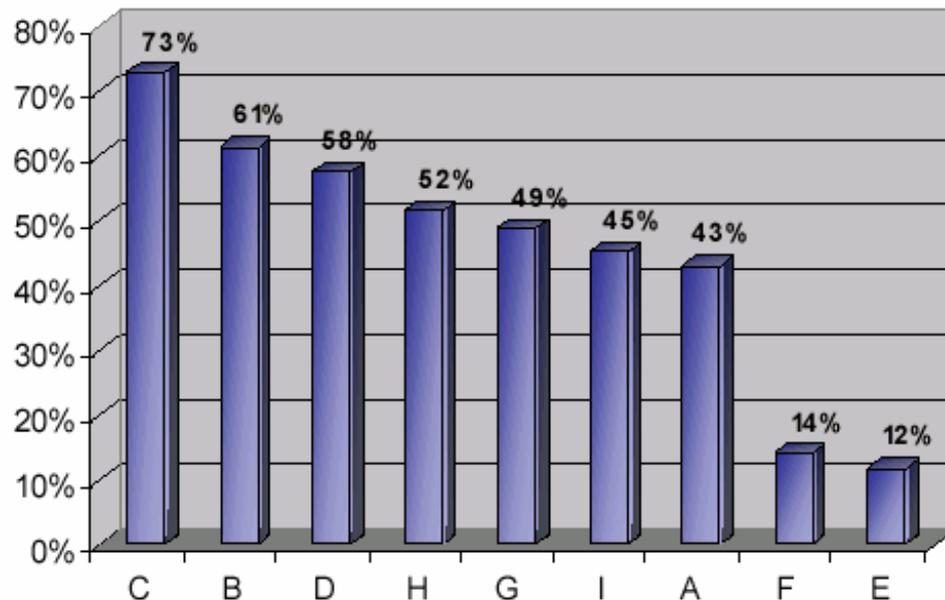
Examination of cumulated current and mid-term demand shows a different behaviour: methods and tools of categories E and F will have, by far, the least mid-term demand (blue bars: mid-term demand, green bars: cumulated current and mid-term demand), whereas the other categories will experience a significantly higher demand in the future. This reveals a relative growth in demand in the mid-term of 43% up to 73% for categories A-D and G-I, but an almost negligible growth for categories E and F.

Current and mid-term demand



The top growth in demand is expected for web-based mentoring (C), web-based tutoring (B), web-based cooperative learning and problem-solving (D), visualization of web-based knowledge structures (H), generation of web-based knowledge structures (G), and development and maintenance of web-based competence networks (I).

Relative growth of demand



These results are consistent with the market trend common analyst studies are portraying for the e-learning market: web-based mentoring will undergo a growth of 93% all over Europe, across the industrial domains. Since the study is restricted to software development and related domains, and due to the fact that, in software development, several of the above methods and tools are already in wide-spread use, the growth result of 73% is seen to be supportive of the analyst studies (IDC, Credit Suisse First Boston, etc) available.

The previous findings are supported by the fact that the responding companies show a medium to high willingness to change their landscape of methods and tools for e-learning. According to the results, this willingness will increase in the mid-term. Moreover, 65% of the respondents perceived the introduction of e-learning methods and tools to be important. Only 11% rated such introduction to be unimportant. Regarding the urgency in introduction of e-learning methods and tools, a total 45% of the respondents gave a rating of "urgent" or higher, whereas 20% did not do so. The differences found in perceived importance (65%) and urgency (45%) support the predicted market trend for the future.

6.6 Players

Drawing a complete and comprehensive list of players on the European e-learning market is an impossible task to achieve. We have tried here to develop some "Case studies".

6.6.1 Knexa.com Enterprises Inc.

Who are they?

Knexa's business is located in the field of Knowledge Management and Citizen/Customer Response application software. The company created a knowledge auction (www.global.knexa.com), a patent pending e-commerce application. Knexa is a publicly traded company, with locations in Vancouver, and Waterloo, Canada and Atlanta, GA, USA. Knexa has quickly grown to become an industry-recognized supplier of information technology to public sector, utility, and regulated industries. Knexa services its customers directly and through business alliances with firms such as IBM.

Strengths and Weaknesses

Knexa shows its strengths in the segments of product portfolio, partnering concept, the reference customers and pricing models. As mentioned above, Knexa created the world's first knowledge auction. Knexa has many alliances e.g. with i7 (Australia), TechBC (Canada), Knexa Europe, TAP Ventures, and Areola. Peerview, gavagai Technology, and Appareo Software belong to their partners. Aeropy, The Alliance of Merger and Acquisition Advisors (AMAA) and HiLCO (The Health Informatics Lab) can be mentioned as some of their reference customers. The weakness can be recognised concerning target customers. Knexa has no specific customer segment. This means that everyone can and should participate as a seller or as a customer.

Market share

It is not possible to elicit the market share of Knexa.com, nevertheless the monumental growth of revenue from 1999 with 710.000\$ to 1.524.000\$ in 2001 shows the importance of Knexa.com in the segment of knowledge marketplaces.

6.6.2 Hot Dispatch

Who are they?

HotDispatch.com is an on-line "information marketplace" for technical expertise, connecting people with technical problems to people helping to solve those problems. They host private-label Community Knowledge Marketplaces, that enable technology providers to grow their communities, while decreasing support costs. Community members, including IT/IS professionals, systems integrators, and channel partners, use the marketplace to buy and sell knowledge services such as questions and answers, project outsourcing, and software exchange. Their office is located in Cambridge.

Strengths and Weaknesses

HotDispatch shows its strengths in the segments of product portfolio, partnering concept, the reference customers and pricing model. HotDispatch offers many types of resources in the categories Questions and Answers, Project Outsourcing, Digital Products and Front Offices. Their extensive partnering concept involves companies like Bluestone Developer Zone, Caldera System, Flashline.com, IBM Developer Works, Jguru, Open Avenue, Palm, Inc., Skills Village and Sun Microsystems. Cisco, Bluestone Software, Caldera, DevX, IBM, Plam and Sun Microsystem can also be mentioned as some of their reference customers Their weakness lies in their target customers. Hotdispatch has a very specific customer segment. They are focused on developers working at a company, independent consultants, and engineering managers.

Market share

It is not possible to elicit the market share of Hotdispatch.

6.6.3 Community of Science

Who are they?

Community of Science, Inc. (COS), currently a privately held company, is a dynamic, fast-paced Internet company located in Fells Point in Baltimore, MD, USA. Founded by the Johns Hopkins University, COS has been publishing on the Web since 1994 and is an established, industry-leading Web portal that serves the international scientific research community. With its online membership of 480,000 scientists and 700 universities, R&D corporations and government agencies worldwide, COS helps researchers find funding, promote their research, and collaborate with colleagues on the Web. So Community of Science, Inc. (COS) is the leading Internet site for the global R&D community.

Strengths and Weaknesses

Community of Science shows its strengths in the segments of product portfolio, target customers, partnering concept and the reference customers. CoS services can be divided into Funding Opportunities, Funding Alert, Funded Research, Expertise, Workbench, Abstract Management System (AMS) and Bibliographic Databases. The COS customers represent over 480,000 individual scientists and scholars, 700 universities and research institutions, 86 Fortune 500 R&D Corporations, 24 international government agencies and multiple small business and entrepreneurial institutes. WebEx, J.A. Majors, Knowledge Universe (KU) belong to their partners. A weakness lies with their pricing model. To become a member of Community of Science an annual subscription fee, which vary from a few thousand to a few hundred thousand dollars, has to be paid. That is why predominantly institutions participate.

Market share

It is not possible to elicit the market share of Community of Science, nevertheless the monumental growth of revenue from 1997 with 4,500,000 \$ to 10,000,000\$ in 2000 shows the importance of CoS in the segment of knowledge marketplaces.

6.6.4 Hyperwave

Who they are ?

Hyperwave was founded in 1997 and its business is Software for Integrated Knowledge Management. The development of the technology behind Hyperwave began in 1989, and the company's success rapidly attracted the interest of the 3i Group and Deutsche Venture Capital Gesellschaft (DVCG). With the help of this investment, Hyperwave expanded internationally and founded an American subsidiary company. Today, Hyperwave has its headquarters in Munich, Germany, with subsidiaries in the United States, Austria, France and the United Kingdom. Hyperwave solutions have been installed in more than 220 organizations worldwide, across a wide range of market sectors including finance, government, education, media and manufacturing. Together with partners such as Microsoft, Oracle, Sun Microsystems, Hewlett Packard and Siemens Business Services, Hyperwave is striving to become the leading provider of holistic Knowledge Management software solutions for business-critical applications worldwide.

Strengths and Weaknesses

Hyperwave shows its strengths in the segments of product portfolio, target customers, partnering concept, the reference customers and pricing model. Hyperwave offers three core products: Knowledge Suite, eKnowledge Portal and eLearning Suite. From this it follows that Hyperwave has four key, proven offerings: Smart Information Distribution, Smart Collaborative Workspace, Smart Collaborative Learning and Interactive Knowledge Center. Hyperwave's most important sales targets are industrial manufacturers, banks, media companies and research institutions. Their partnering concept involves partners in segments of Integration, Consultation, Implementation, Application, Reselling, Training, Technology and Content, for example Unisys Deutschland GmbH, CSC Ploenzke AG and BearingPoint. BMW, Fujitsu Siemens Computers, COLT Telecom, Telekom Austria, U.S. Government, McCann-Erickson, Universal Music and EADS-M can be mentioned as some of their reference customers. Concerning their pricing model it should be mentioned that Hyperwave

provides universities and colleges with the Hyperwave Software (unlimited user licenses) at no cost when the software is used for non-commercial purposes.

Market share

It is not possible to elicit the market share of Hyperwave, nevertheless the revenue of 18,6M€ shows the importance of Hyperwave in the segment of knowledge management systems.

6.6.5 AMMMA

Who are they ?

The company is a spin-off of the University of Bielefeld. It has Cooperation with ESTA-Bildungswerk, Rock 'n Pop Museum Gronau.

Products and services: (Web based) application/Content management tool Community::Web and Learn::Web (Authoring Tool). Pricing: Ammma AG offers the licence as well as the ASP model to clients. The price for the licence is 12.900€. The ASP model is priced 350€ monthly.

Strengths and Weaknesses

AMMMA`s strengths is its comprehensive product portfolio and a strong presence in Europe. The flexible pricing model and ASP offering are convenient for customers; the backing from a University offers financial stability.

One of the weaknesses lies in the fact that the company is focused on Educational institutions and knowledge based companies only and has many small customers. AMMMA has no strong integration partners and lacks a strong market presence.

6.6.6 Blackboard

Who are they?

Blackboard is located in Washington, D.C., USA. Among the private investors are AOL-Time Warner, Dell Computer Corporation, and Microsoft.

Company facts: Revenue 2002: approx. 70 M US\$, 430 employees, 2,400 employees.

Products and services: Blackboard Community Portal, Marketplace Blackboard Transaction System. Blackboard offers the licence as well as the ASP model to clients.

Strengths and Weaknesses

Blackboard`s major strength is the strong market position: the company has :revenues of 70M US\$, a strong customer base in Europe and a comprehensive product portfolio. The company has strong partners and market presence and is backed by prominent private investors.

Weakness: Blackboard targets only one main customer group, which is not well-defined (universities).

6.6.7 Saba

Who are they?

Saba is headquartered in Redwood Shores, CA, USA. The Saba list of partners includes Cisco, Deloitte Consulting, PWC Consulting.

Company facts: First quarter revenue 2002 increased to 14.7M US\$ from 13.9M US\$ in the previous quarter.

Products and services: Saba Interface Server, Saba Business Server. Saba offers its services in an ASP model, as well as based on license fees.

Strengths and Weaknesses

Strength: Extensive product portfolio and many reference implementations. Saba has strong integration partners and a flexible pricing model.

Among the problems which Saba is facing are decreasing profit margins, public ownership and pressure by low share prices.

6.6.8 Docent

Who are they?

Docent offers a solution suite of business performance management applications. Docent has relationships with PricewaterhouseCoopers, Cap Gemini Ernst & Young and Deloitte Consulting. Docent is headquartered in Mountain View, CA, USA.

Company facts: Docent reported total revenue of 6.6M US\$ for the second quarter of 2002.

Products and services: Learning Content Management System (LCMS), Learning Management Server (LMS).

Strengths and Weaknesses

Docent's strength is its range of products: The company offers a comprehensive product portfolio to its 334 customers, among them many Fortune 100 companies. Docent is backed by strong partners for system integration and reselling and shows strong market presence.

Main observable weaknesses are decreasing profit margins, public ownership and pressure by low share prices.

6.7 General trends

The corporate segment is considered as the fastest growing segment of e-learning.

The corporate e-training market is characterized by low barriers to entry: for that reason, it attracts an increasing number of firms and *competition* is getting fiercer and fiercer. Competitive advantage should be obtained by reducing costs: to that extent, *outsourcing and strategic alliances* make it easier for suppliers to enter markets.

For the time being, e-learning actors are numerous and this market is not very transparent for consumers. Therefore, they will tend to trust well-known actors, so that *quality and branding* will become key competitive issues.

Even if barriers to entry are not so dissuasive, *small companies entering the corporate e-learning market have no right to error*. Indeed, the main part of the costs are origination costs –not production or delivery costs. Hence, high losses when sales of the product are not high enough to cover the already incurred production costs.

Another trend is the *increasing interest in Intranet and Internet-based learning materials*. CD-ROMs still dominate the market, but the web has proved much more interactive. Indeed, it enables high standards of service: learning needs analysis, pre- and post-consultancy services, effectiveness assessment.

Concerning equipment, the trend is convergence between countries. Hardware equipment is no longer the only technological criterion. Quick access is required to enable a good interaction, with reliable and adaptable technology.

In terms of figures, an IDC report of February 2002 predicts an increasing magnitude for the European corporate e-learning market: 1.4B€ in 2002, 2.5B€ in 2003, 4.2B€ in 2004 and 6.7B€ in 2005. Figures provided by some market intelligence companies are based on rather broad estimates of corporate investment spending for learning/training, and correspond to a magnitude of 12B€ per year. However, one can not deny that companies have postponed their e-training development plans following the events of September 11th.

A trend of increasing partnership between some learning providers has been observed, for instance Smartforce with Cisco, Microsoft and Docent. These alliances enable e-learning vendors to establish their solutions durably and to increase market share.

Price movements are not expected to be important. In fact, the e-learning consumer is generally not concerned with the price of the product or service as much as they are concerned with its efficiency and quality. In general, one notices that the corporate sector is able and willing to pay much more for similar products than the education and home sectors.

Specific trends by regions:

France: In December 2000 the e-learning market should grow by 41,7 % during the five next years and reach 244M€ according to the study carried out by Rhinfo.com. In May 2001 this market should finally grow by 40 % a year and represent 2,2 % of the expenses concerning further training. On the long term, the net should gather 70% to 80% of the further training according to La Tribune. The study carried out by Arthur Andersen Consulting and published on the first semester 2001 revealed that 60% of the 74 polled companies say that they have already resorted to e-learning.

Germany: Among German firms the activity of which is mainly based on IT education, software development, sales and marketing, it clearly appears that e-learning is one of the main tool to implement continuing education for employees and middle-management

executives. As a matter of fact, 43% of the polled firms claim that they have occasionally used e-learning as form of continuing education, while 11% have resorted intensively to e-learning. Compared with other traditional tools, e-learning comes among the first, behind journal and professional books (52%) and presence seminar (44%). The largest share of companies making use of e-learning can be found within the service sector (55%), among which especially banking and insurance companies have already implemented e-learning technologies to a very large extent (68%).

Italy: The number of residential and business broadband Internet subscribers is climbing from just more than 2.17 million in 2001 to around 2.8 million in 2003, according to estimates from the Yankee Group. However, subscribers should grow to 4.94 million by 2006. TI now offers DSL service (cable modems are nearly nonexistent in Italy) in 600 cities, encompassing some 80% of the population. Forrester expects more than one-fifth of Italian households to have some form of broadband access by 2006. Adoption of the Internet by businesses has climbed faster. Use of the Internet for commercial purposes is experiencing exponential growth, driven by a new awareness among Italian executives and small-business owners of its potential, according to a report by research firm Gartner. As they migrate online, these small firms are unlikely to hire in-house Web expertise but will rely on outsourcing. Data processing, security, and network-management services grew by more than 26% in 2000 and by 30% in 2001. In all, Gartner expects Internet-business services to grow by nearly 41% annually between now and 2006. Application service providers face a huge growth market in Italy, and research firm IDC expects corporate e-learning revenues alone to triple between now and 2004.

6.8 Threats and Challenges

What is the future of European eLearning market? What opportunities and risks could occur in the next years?

First, the future of e-learning is linked to the upgrade of telecom infrastructures. In this field, optimism is overwhelming and few people seriously doubt that technology will be a hurdle to the development of e-training. In addition, as the May 2002 Information Society report underlines, the learning based services are expected to be ad to remain an important economic sector.

The major hurdle to the development of a proper European "e-learning" market is that it *is fragmented between countries*. The barrier of language and cultural differences are hurdles to cross-country co-operation.

The influence of the traditional "schooling" model could also be a break for a quick development of e-learning market. The May 2002 Information Society report expects a reluctance to change in that area.

Service provision and personalisation (guidance and support) are expected to become more and more important. In the coming five to ten years, integrated service provision should be the most frequent standard. The L-Change survey considers that the winning category in the next five years will be "those who will be able to offer system solutions or niche products with ad hoc services, tailored and expensive, but of high quality". The May 2002 Information Society report takes the same stance, adding that an "exhaustive offer (including services) would be a positive comparative advantage".

Access to funding is a major challenge in this respect. Collaboration between education entrepreneurs and investors should get more and more intense and should result in well-funded ventures with sound strategies. Venture capital (VCs) notably could back e-learning projects. The problem often noticed is lack of understanding between the investor and the

education entrepreneur. In order to attract VCs and other private investors, the European authorities could set up a European e-learning Investment Fund (EIF).

Business Angels could also play an important role in the future. They could provide expertise to the candidate projects for EIF in order to meet the necessary requirements for funding.

Finally, the institutional context of learning should also be taken into account. The European Commission, who has set up priorities in its e-learning Initiative for the European Commission, could support these priorities by subsidizing chosen projects.

Governments could also step in the e-learning challenges. They are potentially able to support supply by commissioning materials and services. But they could also support demand by increasing the funding for e-learning purchases in the two segments they control: education and government training.

Specifics by regions:

France: Internet remains a limited source of e-learning solutions, as only 31% of French companies use it for e-learning purposes, whereas the Intranet is used by more than half of the companies. Resorting to Intranet appeared as a solution in 1999 and has been developed since this period. However the mixed system (on and off line) is steadily growing. These systems are especially used by companies with less than 200 employees. The decrease of Internet and Extranet as a solution for e-learning is about 5% a year. Providers must focus on this growing interest for Intranet access to e-learning.

Germany: The top growth in demand (between 70 and 93% in the next four years) is expected for web-based mentoring, web-based tutoring, generation of web-based knowledge structures and development of web-based competence network. These results are consistent with the market trend common analyst studies are portraying for the e-learning market: Web-based mentoring will undergo a growth of 93% in Germany across the industrial sectors. On the other side, a stagnation of plain e-learning tools is expected in the future. The offered or existing software and the quality of content is also seen, in many cases, to be unsatisfactory. Moreover, the efforts for knowledge capture linked with a high price do not act in favour of a global use of e-learning tools. One has also to admit the fact that the e-learning market is limited by the needs in continuing education, which are not important in many sectors. In Germany, e-learning tools will have to offer process integrations in the future. To face that demand, e-learning firms will have to offer both tools and a sound methodology.

Italy : A crucial aspect of Italy's training system is the mismatch between the demand for and supply of skills. In order to improve the situation, the Joint National Committee on Training (Organismo bilaterale sulla formazione) - set up in February 1996 following an agreement signed by the Confindustria employers' confederation and the Cgil, Cisl and Uil union confederations - is conducting a survey of the training needs of Italian firms at sectoral and territorial level. The aim is to set up a national system for monitoring companies' skills needs. The first results were presented at the end of November 1998. The survey concentrated on certain industrial sectors (such as chemicals, electronics, machine tools, food, transport, pharmaceuticals, textiles and transport), within which seven areas of activity were examined - administration, commercial activities, logistics, research and development, design, quality of the work environment, maintenance, and production. The survey's main finding is that there is increased demand for workers with versatile skills. In production, for example, the numbers of traditional shop-floor workers is declining with a corresponding increase in the control and management of processes. In administrative activities, office work increasingly involves services related to the marketing of products (eg customer assistance). In general, the most widely sought-after skills are: knowledge of foreign languages; the use of information technology; and social skills like relational capacity, decision-making ability, a sense of initiative, working group ability, leadership and problem-solving ability.

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