A Socioeconomic Approach to the Development of E-Learning

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Abstract

A multitude of products, systems, approaches, views and notions characterize the field of e-learning. This article attempts to disentangle the field by using economic and sociological theories, theories of marketing management and strategy as well as practical experience gained by the author while working with leading edge suppliers of e-learning. On this basis, a distinction between knowledge creation e-learning and knowledge transfer e-learning is made. The various views are divided into four different ideal-typical paradigms, each with its own characteristics and limitations. Selecting the right paradigm to use in the development of an e-learning strategy may prove crucial to success. Implications for the development of an e-learning strategy in businesses and educational institutions are outlined.

Keywords: E-learning; Knowledge creation; Paradigms; Strategy; Ideal types; Innovation; Learning; Market Orientation.

1. Introduction

E-learning, one of the buzzwords of the early 21st century, is usually understood as learning by electronic means, but this definition is very broad and signifies different things for different firms and people. Thus the e-learning label has been pinned on everything from off-line learning software to advanced on-line learning in virtual learning spaces.

Correspondingly, all possible notions and ideas of e-learning have thrived among suppliers and buyers; this diversity of interpretation is also apparent in the press coverage and academic treatment of e-learning. If the field appears multi-faceted to academics, it must seem somewhat chaotic to decision-makers, who, in the end, may have little to gain from consultants with a vested interest in selling their particular products.

This article maintains that while ideas, notions and products are subject to great variation, this variation still follows certain systematic and ordered patterns. The observed order can be used to disentangle the field of e-learning and identify several possible avenues of development. By implication, the development of a successful e-learning strategy in educational institutions as well as in corporations and society at large can be facilitated.

Much research on e-learning is predominantly inspired by theories of communication, organization and pedagogy and by developments in information technology. This article, in contrast, draws inspiration from theories of economics and sociology, the theory of marketing management and strategy, and especially from the author's practical work on developing e-learning systems and processes (for example, as described in Smith & Duus, 2001; Pettersson, 2002; Duus and Ehlers, 2002; 2004; Pettersson, 2005, 2008; Lindberg & Pettersson, 2007).

Following the introduction, the article proceeds with some conceptual and methodological considerations on how e-learning can be researched and how the field can be subdivided and understood. These considerations are heavily influenced by theories from economics, corporate strategy and marketing. Subsequently, a sociological model is developed for the subdivision of views on e-learning into four different ideal-typical paradigms. The differences, similarities, possibilities and limitations of each paradigm are identified and used to evaluate the potential of each paradigm. To conclude, strategic implications for firms, learning institutions and society are developed and outlined.

2. Methodological Considerations and Conceptual Subdivisions

What is meant by e-learning and how should the field be researched? In recent years, scholars, analysts and journalists have attempted to describe and analyze the field of e-learning to create some order, structure or overview. Many of these attempts have been only marginally successful. One reason is that most such attempts can be classified in one of the three following categories, each of which focuses on a specific aspect of e-learning, thus excluding the big picture:

1. The technological category, which contains descriptive technology-based listings of various forms of e-learning hardware and software solutions.

2. The business category, which contains generalized analyses of what is usually referred to as the e-learning industry or the e-learning market.

3. The pedagogical category, which contains descriptions of learning styles and considerations on how to teach using e-learning.

A number of studies also suffer from methodological problems that make it difficult to attain an overview. Among the most common are:

1. *The fallacy of transferable competence:* A belief that the traditional pedagogical/communicative knowledge and competence commonly used in non-virtual settings is immediately transferable to the more virtual settings of the field of e-learning. Belief in this fallacy is not limited to practitioners favoring ex cathedra learning styles, but extends to academics favoring advanced learning models of the constructivist problem-oriented sort. What has not been adequately realized in many circles is that even the nature of problem-oriented and/or project-oriented learning changes dramatically in virtual settings. Many e-learning projects that have failed to achieve the objectives of instituting a culture of learning rather than teaching can be cited as examples of this fallacy.

2. *The fallacy of missing homogeneity:* The use of questionnaire surveys on a large sample of suppliers and customers. Here the problem arises because respondents do not have the homogeneity necessary to ensure that such surveys attain relevant practical or scientific value. For example, the results of a survey asking companies about their use of e-learning is worthless if strategic, tactical and operational purposes, hardware, software, pedagogy/educational approaches, target group and learning goals etc. vary from company to company. To illustrate, one study claimed that e-learning users had extreme drop-out and failure rates, while data from users and suppliers of advanced e-learning solutions told a different story (Ørskov, 2000).

3. *The fallacy of marketing myopia:* Quantitative studies of market size and growth using supply rather than demand considerations. Many analyses of the e-learning "market" suffer from classic marketing myopia mistakes since they focus on developments in supply rather than in demand, needs and customer groups. The focus is on either aggregated sales development in e-learning firms or the total realized ex post use of e-learning (Levitt, 1960; Abell, 1980, 1993; Duus, 2002). Both cases are examples of supply considerations. Consequentially, many analyses of the e-learning "market" are of limited value. A case in point is Urdan & Weggen (2000).

4. *The fallacy of the missing forefront:* No targeting of top-ranking suppliers in cross-case studies. While several cross-case studies of suppliers do exist, many of them seem to have avoided targeting top-ranking suppliers. Consequently, limited cross-case research into what actually constitutes best practice exists and hence, there have been no reliable "in search of excellence" studies. The otherwise splendid cross-case analysis by Hansen & Borup (2001) can serve as an example. This study attempts to present top-ranking suppliers, but fails to identify the position of those in the forefront at that time.

5. *The fallacy of pure theory:* Disregard of the fact that e-learning is a practice-oriented field of research and development comparable to fields such as surgery, anthropology and management. The reason is that a great deal of tacit knowledge is

needed to develop e-learning systems and processes. Analogously, surgeons must have years of practical experience to achieve true competence and knowledge within their field and fields like anthropology and management rest on a solid foundation of action research, real-world field studies and real-world case research (Spender, 1994; Gummesson, 2000). According to this author's practical experience with developing, executing and evaluating e-learning processes, the influence of consultants and academics lacking practical experience with e-learning is one of the main reasons for the slow development of e-learning in many companies and learning institutions (Duus, 2002).

Therefore, a sensible research approach to the field of e-learning should include action research among forefront suppliers combined with an angle not derived exclusively from pedagogy, technology and communication studies or from simple superficial market studies.

Since e-learning solutions are produced by someone (the suppliers) and are in demand by others (buyers or users), an economic point of view may prove useful, especially in regard to achieving a correct picture of the industries and markets within the field. Received economic theory states that there are two different (only partially complementary) ways of defining industries as well as two complementary ways of defining markets.

The Porterian industry definition posits that an industry is a group of firms producing products that are close substitutes (Porter, 1980), whereas the Abellian definition defines an industry as a group of firms sharing identical supply characteristics (in the form of technology, knowledge and competencies) that may potentially satisfy several distinct customer groups and their needs (Abell, 1980, 1993) [1].

Correspondingly, the classic market definition states that a market consists of products that are close substitutes (Rasmussen, 1977). This is accordance with the more complex Abellian market definition, which defines the market by the distinct needs of a specific customer group. These needs may potentially be satisfied by different firm-specific bundles of technology, knowledge and competencies (Abell, 1980, 1993).

Put briefly, a market and an industry are two very different concepts that mirror one another. An industry is defined by its supply characteristics and is open-ended on the demand side, whereas a market is defined by its demand characteristics and is open-ended on the supply side.

If the tools of economic theory are applied to the field of e-learning, it becomes clear that it is meaningless to talk about one single e-learning market. Rather, the field consists of literally thousands of smaller markets, depending on how many customer groups and adjacent needs are defined.

Accordingly, more than one e-learning industry must be defined depending on the distribution of competencies and knowledge. Industry definitions may be conceived along the lines of a functional subdivision depending on what the e-learning delivery systems "do" and are potentially capable of. The premise here is that such a functional subdivision reflects underlying differences in competencies and knowledge.

Over the last decade, several economists have maintained that such a functional subdivision has emerged in the distinction between knowledge creation e-learning and knowledge transfer e-learning (Pettersson 2002, 2005, 2008; Lindberg & Pettersson, 2007).

Knowledge creation e-learning is characterized by providing learners with the ability to learn by creating their own knowledge and by targeting selected groups with high quality solutions and processes. In practice, this is achieved using online asynchronous problem-oriented learning through highly intense, multiple, person-to-person dialogs in closed virtual learning spaces (Pettersson 2002, 2008). Knowledge creation e-learning is also characterized by being very capital-intensive and by suppliers following a differentiation strategy leading to high profit margins (Selling and Stickney, 1989).

Since 1997, the approach has disproved several common myths about what can be achieved by e-learning. For example, participant evaluations have shown that even purely virtual knowledge creation e-learning is rated better on all accounts, not just when compared to traditional chalk-and-talk teaching but also when compared to blended knowledge creation e-learning. The academic level is higher, allowing participants to reach higher levels on the Bloom (1956) scale. Because of the intense dialog, participants state that they do not even miss the social interaction found in physical settings (Duus, 2000a, 2000b, 2001, 2002; Smith and Duus, 2001; Duus and Ehlers, 2002; Duus, 2003; Duus and Ehlers, 2004; Pettersson, 2008).

By contrast, knowledge transfer e-learning is more in line with mainstream notions of how e-learning should be practiced. Knowledge transfer e-learning, which is what most suppliers provide, accordingly draws most attention in the press and academic research.

Knowledge transfer e-learning is comprised of all the e-learning products, solutions and processes that focus on the simple transfer of given knowledge to learners. Suppliers typically follow a cost minimization strategy with a low profit margin on products and solutions (Selling and Stickney, 1989). In their marketing, knowledge transfer e-learning suppliers tend to stress how much time and money companies, learning institutions and individuals can save by buying and using this form of e-learning (Duus, 2002).

Following the Abellian definition of industry, two distinct e-learning industries can be identified: the knowledge creation e-learning industry and the knowledge transfer e-learning industry. This distinction, which reflects underlying differences in knowledge and competence between developers and suppliers of e-learning was first proposed by Michael Pettersson [2]. However, it reflects development work carried out by various researchers throughout the nineties. The terms "knowledge creation e-learning" and "knowledge transfer e-learning" are in full accordance with earlier uses of the terms "high-end e-learning" and "low-end e-learning" respectively by Duus (2000a, 2000b, 2001, 2002). Figure 1 is an attempt to provide an overview of the distinction and its characteristics.

Character-istics	Knowledge transfer e-learning (low-end e-learning)	Knowledge creation e-learning (high-end e-learning)
Pedago-gical ob-jective	Transfer of knowledge and information via ICT as a simple means of delivery	Creation of new knowledge via creative use of ICT
Competit-ive strategy	Volume-based, low-capital intensive production of e-learning with low profit margins.	Capital intensive, highly profitable production of e-learning for a selected target group.
Competit-ive edge	Cost reductions as compared to traditional education and instruction.	Differentiation from other e-learning products. Virtual value network development.
Marketing	Aggressive mass marketing. "Inexpensiveness" argument.	Relationship marketing. "Quality" argument.
Practical character-istics	Off-line/on-line, synchronous/asynchronous, non-problem-oriented, low interactive learning.	On-line, global 1-to-1 omnipresence, asynchronous, problem-oriented, dialogue-oriented, virtual coaching, time/place/pace principle.
External appear-ance	Uploading of documents on the net, off-line learning technology, chat, simple dialog strings in networks.	Closed hyper-flexible intra- and extranets, supporting all types of communication – most typically asynchronous forms.
Areas of innovation	Primarily technological innovation, only marginally non-technological.	Significant innovation in content, technology, administration, organizational culture, pedagogy, finance, and all other imaginable fields.
Coverage	Very popular. Mainstream approach.	Relatively unknown.
Applica-tion areas	Education and training exclusively.	All types of learning – such as research, development, education, training, consulting and project work.

Pure examples	Widespread among learning technology companies and numerous suppliers of e-education. Often erroneously made synonymous with e-learning. Most of the press coverage and academic research on e-learning has so far dealt with knowledge transfer e-learning.	Center of Market Economics CME-model as practiced in the HD (A/U) and HD (FR) programs. The E-MISE education of the A.P. Møller-Maersk Group, which have been developed along the lines of the CME-model. Center for Innovation and Entrepreneurship (the Kubusnet system). The Danish Insurance Academy (the Team Program) Closed electronic networks for R & D and management communication (global virtual team management) in major companies (for example, the Siemens ShareNet system or Shell's SIEP). Recent programs built on the Ice-Core/Novell platform.

Figure 1: The Difference between Knowledge Creation E-Learning and Knowledge Transfer E-Learning (Following Duus (2002)).

Three further aspects of knowledge creation e-learning deserve particular mention. While most examples of knowledge transfer e-learning are found in either learning institutions, such as universities, or in companies buying or selling learning technology, it is peculiar that knowledge creation e-learning in most cases seems to involve trans-disciplinary cooperation between learning institutions and business firms similar to that found in mode 2 research settings as described by Gibbons, et al. (1994).

Another characteristic is the practice-based development associated with knowledge creation e-learning. While many academic suppliers of knowledge transfer e-learning pride themselves on solutions based on the latest theoretical advances in pedagogical research, knowledge creation e-learning suppliers instead pursue development by experimental and experiential means. The latter "action research" approach is completely logical given that e-learning development involves the development of methodologies and systems dealing with the actions and reactions of human beings (Baskerville & Wood-Harper, 1996a, 1996b; Itoh, 1996; Gummesson, 2000). Thus, it cannot be pursued without the development and utilization of tacit knowledge (Polanyi, 1966; Nonaka & Takeuchi, 1995) [3].

The third aspect is perhaps the most staggering. Knowledge transfer e-learning clearly embodies what may readily be labeled the mainstream approach, whereas knowledge creation e-learning is more advanced on a wide number of accounts. The observed differences thus imply that a divide exists between the mainstream approaches and certain leading edge suppliers.

The observed differences between knowledge transfer e-learning and knowledge creation e-learning allow us to underline a problematic characteristic of the treatment of the field of e-learning in the press and in many academic publications. The problem is that knowledge transfer e-learning has been given very extensive coverage at the expense of knowledge creation e-learning.

Within academia, this can be evidenced by referring to a number of studies in recent years, which presented themselves as definitive treatments of the whole field, but which focused exclusively on what can be labeled as knowledge transfer e-learning. Rightfully, to avoid any misunderstandings, it should be stressed that this critique is concerned with substance and not with terminology. In other words, it is not simply a matter of omitting specific words like knowledge creation and knowledge transfer but of avoiding the description of a certain class of approaches in works described as definitive.

A few examples are Johansen & Terkelsen's (2001) research on corporate e-learning strategy development, Elkjær & Olsen's (2001) comparative studies on the use of e-learning and Kinch & Leinenbach's (2003) charting of the field of e-learning in Denmark, all of which ignore knowledge creation e-learning and are limited to knowledge transfer e-learning. The cross-case study of advanced e-learning solutions by Hansen & Borup (2001) has only one example of knowledge creation e-learning in a large sample and it is not identified as a distinct approach. The advanced and theoretically ambitious treatment by Dirckinck-Holmfeld & Fibiger (2002) makes a case for their concept of Computer Supported Collaborative Learning, which resembles knowledge creation e-learning in some respects. However, the general approach and their conclusions are limited to the knowledge transfer e-learning approach.

One probable reason for this seems to be rooted in the fact that a substantial number of investigations have been broad and comprehensive and have not involved extensive in-depth studies of leading edge suppliers. If the latter approach had been chosen, we would probably have seen a better treatment of knowledge creation e-learning. The main impression is that the three categorical biases and five methodological fallacies previously mentioned abound.

Marketing efforts by e-learning companies and the treatment of the field in the press have to a great extent reflected this situation. In the late nineties and the first few years of the new millennium, many companies producing and selling learning technology referred to themselves in pompous terms far removed from reality and several supposed e-learning experts "lectured" in the media with little or no real knowledge of the topic [4].

3. Ideal Types and the Construction of Meaning

Why did many companies and supposed e-learning experts produce such exaggerated or one-sided statements? One possible explanation is the hype that seems to be an integral part of most growth phenomena in economics and which certainly played a part in the dot.com boom of the late nineties. The downturn in the first few years of this millennium has, however, only reduced the frequency of such fallacious statements.

Economic distress may be a more valid explanation for at least some of the one-sidedness and the exaggerations produced. Most knowledge-transfer e-learning companies have faced a situation in which a low profit margin has provoked a volume-based strategy accommodated by very aggressive and opportunistic marketing efforts (Selling & Stickney, 1989; Duus, 2002). It is quite understandable that most e-learning firms have fared badly when one considers the pressure created by a low profit margin in combination with a faulty understanding of market conditions [5].

Presenting the last part of the puzzle, another explanation may be simple ignorance combined with an opportunistic search for academic merit. Many "experts" were able to attract a great deal of attention and recognition without having much concrete practical experience with e-learning. This tendency seems to have been reinforced by an insufficient recognition of the fact that e-learning is a new kind of learning, for which traditional pedagogical competence and knowledge is of limited use only (Duus, 2002; Duus & Ehlers, 2002; Jacobsen, 2002; Duus & Ehlers, 2004; Lindberg & Pettersson, 2007). This was earlier referred to as the fallacy of transferable competence.

In general, it seems that ignorance created by the joint effect of investigative bias, methodological fallacies, academic and/or economic opportunism and lack of practical experience with the subject seem to have been at work within the field. This joint effect is a highly probable reason for the observed slow implementation of e-learning in many companies and learning institutions. However, a more detailed explanation can probably be created by attempting to understand the motives of various e-learning actors (i.e. suppliers and researchers) through the use of ideal-type methodology. This implies that the subjectively held ideas, attitudes, opinions and notions of the various actors are seen as mirroring observed actions in the field.

This points to the method of "understanding", the objective being to analyze subjective motives for action by letting researchers put themselves in the position of the acting individual (Weber, 1949) [6]. The premise is that acting individuals (as human beings) ascribe a subjective meaning to their actions by an implicit or explicit reasoning regarding the cause of their actions. According to this view, human beings are seen as genuinely creative individuals interpreting their social reality and acting creatively within it. Empirical observations of human action can thus be systematized along ideas, notions and attitudes. In other words, human action is evaluated in the light of the goal-orientation of the individual (Kalberg, 1994).

This research method follows neither the purely materialist/positivist position of quantification and representative populations nor the subjectivist position involving focusing on individuals and single cases. In short, it is based on neither statistics nor cases. It is, in contrast to the above positions, a method focusing on (the) typical instance(s) or representation(s) based on subjectively meaningful ideas, which can be ascribed to them within a frame of methodological individualism (Kalberg, 1994; Rangstrup, 2000).

Larger sets of subjective meanings do, of course, exist and can accordingly be ordered in what Weber (1949) calls ideal types. Ideal types are pure types of the subjective motives of human beings and rationalizations of actions, which may or may not correspond to single empirical cases. Ideal types are neither attempts to construct an extensive description of reality nor attempts to introduce theories or law-like generalizations. Ideal types are solely attempts to create yardsticks by which to assess reality (Kalberg, 1994).

Use of the ideal-typical method must thus proceed with some qualifications. While the idea is to create a general classification on the basis of observations of factual empirical conditions, it is not implied that it is possible to reverse the analysis, claiming that some specific firms and individuals possess these characteristics in full. Ideal types provide a way to structure reality in all its complexity by accentuating certain typical aspects in their purest form even though these pure forms are not found in reality. While they are not thought of as real firms, individuals or instances, an approximation of real forms can nevertheless be found by combining features from the ideal types or by pointing to nearly perfect matches.

Ideal types are often used in strategic and economic literature. Their use is, however, so frequent that they are often not referred to as ideal types. Some examples are Porter's (1980) generic strategies, Galtung's (1981) classification of researchers and their methodological dependence on culture, Mintzberg's (1983) classification of organizational forms, Mintzberg, Ahlstrand & Lampel's (1998) classification of strategy theories, Sundbo's (2001) classification of innovation theories and Hougaard & Bjerre's (2002) classification of relational strategies.

4. Four E-Learning Paradigms

Given the great differences that exist between various types of e-learning, it should be possible to make an ideal-typical classification that goes beyond the simple distinction between high-end knowledge creation e-learning and low-end knowledge transfer e-learning. A classification that takes into account the subjective human aspects of e-learning construction may be able to shed more light on why some developers and producers choose low-end solutions while others choose high-end solutions.

What can be underlined here is that the simple distinction mentioned above only specifies or rather describes which main forms of e-learning exist. The distinction does not answer the crucial question of why such forms come about. Questions of "origin" imply a need for an ideal-typical classification based on subjective development aspects.

A bird's eye view of the field of e-learning enables us to represent an ideal type classification with two dimensions: the degree of business orientation vs. the degree of traditional academic orientation and the degree of learning orientation vs. the degree of teaching orientation.

Business orientation is seen here as the opposite of a traditional academic orientation. The traditional academic system (i.e. research and teaching in schools of higher learning) has its mirror opponent in the still faster development of recent years that takes part in the business sector, where the advent of e-learning, global competition, mass individualization, mass customization and the new status of private firms as mode 2 knowledge producers are exerting pressure on the existing system (Cova & Haliburton, 1993; Gibbons et al., 1994; Angell, 2000). This implies that a substantial part of all knowledge production today takes place in trans-disciplinary ventures outside of the traditional academic system and that many knowledge producers in the academic sector face a demand for action and adaptation, making it reasonable to ascertain that a process of "creative destruction" is going on (Schumpeter, 1983).

Business orientation should, however, not be interpreted as a quality possessed only by actors outside of the traditional academic system. Rather, it should be interpreted as a counterpart to the traditional academic system, where mono-disciplinary mode 1 knowledge, exclusively in the form of publications, is produced (Duus & Jørgensen, 2004). Thus, business orientation reflects merely the degree to which knowledge is produced according to the needs and wants of business.

Learning orientation is accordingly the natural counterpart to what can be called teaching orientation. It is thus possible to create a spectrum of pedagogical objectives ranging from teaching to learning by following the taxonomy of levels of understanding created by Bloom (1956) or by seeing learning as the counterpart of teaching. The not so implicit meaning is that the very fact that something is taught does not imply that it is learned. Also, a focus on learning draws attention to the learner and learning processes as something happening partly within the learner. According to this perspective, understanding and knowledge are inwardly created rather than externally given. In contrast, a focus on teaching draws attention to the teacher and what is taught. In this case, knowledge is presented as something given (Illeris, 2002) [7].

In a classification we may refer to ideal-typical views as "world views" held by people working with and talking about e-learning. Following the tradition of Kuhn (1962), a more fitting word could be paradigms as this word is often used by philosophers of science to describe world views in a scientific community. With this in mind, the following model (see Figure 2) applies:
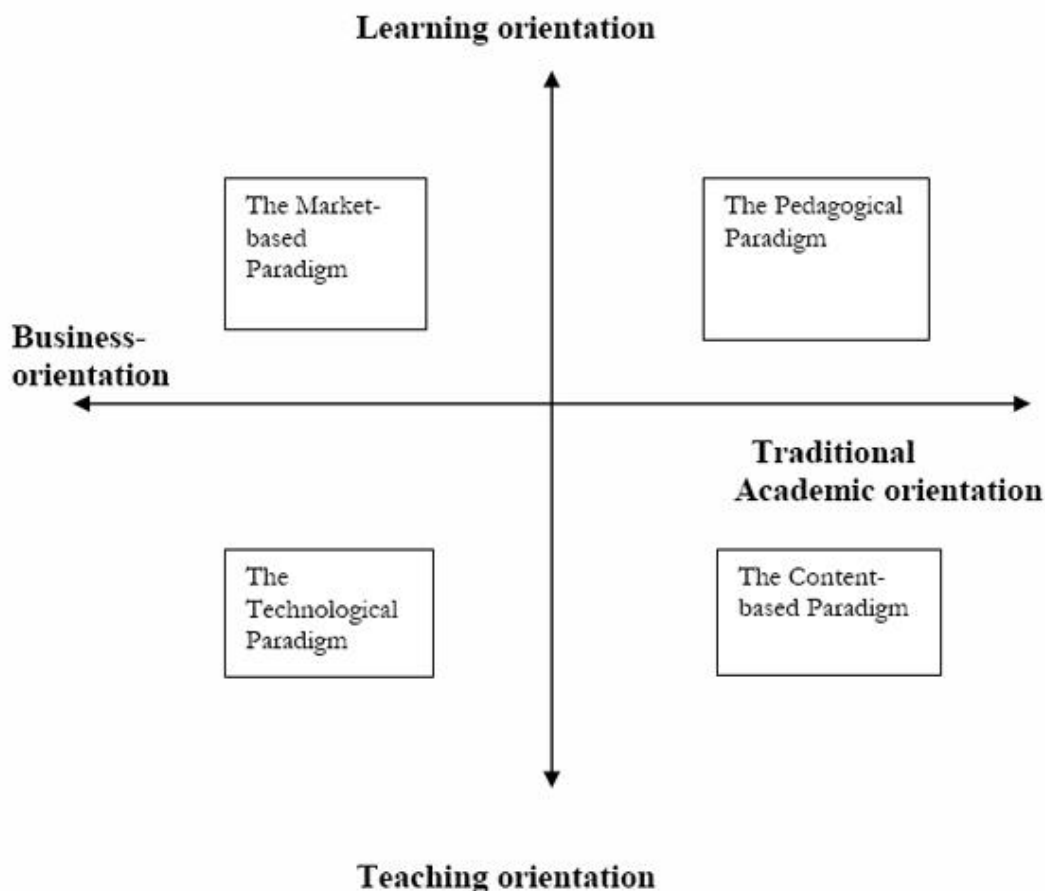
Figure 2: The Four E-Learning Paradigms.

Figure 2 depicts four basic ideal-typical paradigms that find empirical expression in four different interest groups and four corresponding worldviews from which four different strategies for the development of e-learning can be derived.

4.1 The Technological Paradigm

The technological paradigm views e-learning first and foremost as a technological challenge and e-learning development is mainly seen as driven by technology. Typical representatives of this paradigm are the many so-called e-learning firms. Most examples are found in the business sector, but a few are found in the academic sector.

These firms are in general a product of the traditional ICT sector, which grew to fame in the nineties. Typically, their employees, managers and investors have backgrounds in the ICT sector. Products often include software programs, networks, multimedia and portals for e-learning. Some suppliers have specialized exclusively in off-line products. Basically, producers are doing their business immersed in technology, the typical unique selling proposition being educational cost savings.

Individuals and firms following this technological paradigm will likely ascribe themselves qualities like market orientation and pedagogical orientation. This may be true in a few select cases; however, these qualities diminish as the following characteristics increase.

1. **Business cycle sensitivity:** Most firms follow the up and downturns of the ICT sector.

2. **ICT background:** The cultural heritage of these firms is derived from the ICT sector.

3. **Cost savings as a competitive unique selling proposition:** Products are marketed on the explicit premise that they enable cost savings on the educational budget while upholding learning quality, indicating that such firms are not market oriented, but instead follow what is commonly understood as product or production orientation [8].

4. **Low complexity products:** Products are of low complexity, like e-courses in personal computing and the like. Focus is first and foremost on training and teaching and not on learning and creative problem solving.

5. **Technology is used for transmission:** Products are characterized by the attempt to transfer traditional pedagogy and academic/professional content by electronic means. Examples can be found among the many products that use some form of screen-based transfer. Synchronous communication may be preferred to asynchronous. A classic example is the video transmission of lectures directly to the personal computer of the recipient (Carstensen, 2000; Aldrich 2000).

If just one of the above five characteristics holds true for a supplier, it is highly improbable that we are dealing with a high degree of market orientation. However, this does not mean that representatives of the technological paradigm cannot make a profit from their activities; indeed, some do. But, as mentioned earlier, since most of the firms claiming to be in the e-learning business are nothing but producers of learning technology, they have to a high degree faced the same difficulties as ordinary ICT firms. By and large, the market has been a buyer's market, with profits being realized as gains in efficiency and innovation in larger firms with their own educational programs.

4.2 The Content-Based Paradigm

The content-based paradigm views e-learning as a kind of electronic correspondence college or as an opportunity to "electrify" or "e-ase" traditional chalk-and-talk teaching. Traditional thinking in content and pedagogy is not abandoned and no educational re-design of the basis of pedagogical innovation and adaptation to the demands of markets and business are attempted. E-learning is seen exclusively as applicable to education and not as an opportunity for innovation in other forms of learning [9].

Representatives and proponents of the content-based paradigm can be found in the many educational institutions, which implemented e-learning without taking advantage of the interactivity made possible by modern technology. Competition is based on price and cost savings, which are easily achieved once interactivity is sacrificed [10].

The practical implementation is characterized by the uploading of documents, films and exams to intranets and by enabling a limited amount of interactivity in the form of chat rooms and other virtual Q & A features that are nothing but an intranet variety of emails.

As yet, it remains unclear how representatives of the content-based paradigm will fare in future, but there is no doubt that they have a certain strong appeal to individuals looking for inexpensive education. A pertinent question is whether political decision-makers in the long run will accept solutions of low quality provided by institutions following the content-based paradigm. However, it is probable that society in the future will see a highly diverse educational supply, some of which will be e-education with the characteristics of a diploma mill.

A critical question is also whether larger academic institutions will accept several highly diverse delivery systems within their organization. It is not an optimal intra-organizational situation to have delivery systems that span the full spectrum from the best to the worst. However, variations in personal and intra-institutional competencies may necessitate a certain tolerance that is untenable in the long run.

4.3 The Pedagogical Paradigm

The pedagogical paradigm is based on the premise that it is to some extent possible to transfer existing pedagogical knowledge and competence to the new e-learning reality and that pedagogy must guide the development of e-learning even if this means ignoring demands and constraints imposed by content, technology and/or markets/businesses.

The typical representatives of this paradigm are found among academic researchers and teachers within pedagogy, communication, organization and management theory. The core beliefs of the paradigm are to a large extent equivalent to the dominant research streams within e-learning.

An important characteristic shared by the pedagogical paradigm and the content-based paradigm is the point of departure in the traditional educational system. However, where the content-based paradigm tries to utilize new technology to create an electronic correspondence school, the pedagogical paradigm takes a distinct reformist stance in trying to implement new ideas on pedagogy.

Because of this, proponents of the pedagogical paradigm tend to view their ideas and actions as progressive and themselves as avant-garde. This stance is, however, far from validated when business demands, political reform pressure, the general development of e-learning and the possibilities for using e-learning for means other than teaching are taken into account. The "optics" of the pedagogical paradigm is comprised of four lenses, including the public sector, university institutions, the existing educational system and pedagogy.

These distinct lenses define massive limitations on the possible practical use of the paradigm. At first glance, the paradigm seems progressive in that it attempts to implement a learning pedagogy as distinct from a teaching pedagogy. However, the different lenses raise a number of problems by their implicit and sometimes explicit non-consideration of a possible gap between business and market demands on the one hand and the existing academic/professional content on the other.

The need to base any attempt at a radical redesign of academic/professional content, pedagogy and the administrative/economic conditions integral in the delivery system on real-world business problems is thus ignored. This implies that the pedagogical paradigm, similar to the content-based paradigm, views e-learning as an educational challenge only, thereby disregarding the considerable potential in using e-learning in other areas of learning like research, development, consulting, and project management.

Of all the e-learning paradigms, the pedagogical paradigm is the most distant from practical application. In contrast to the other paradigms, it has not developed primarily via practical experience-based knowledge building, but has instead relied heavily on theoretical studies and empirical investigations on how various suppliers have worked with e-learning. This is, of course, in complete accordance with existing academic practice, but implies unfortunately that many of the methodological fallacies mentioned in the beginning of this article abound within the pedagogical paradigm.

In terms of what constitutes the "right" way in academia, the pedagogical paradigm may be seen as very politically correct. This has promoted its present day position as the most popular paradigm amongst politicians and public officials.

4.4 The Market-Based Paradigm

The market-based paradigm takes its point of departure in pure market orientation, implying that business firms are seen as buyers and that the needs and wants of business firms should be the primary guiding design principle in the development of e-learning systems and processes [11].

Further, the development of e-learning, if necessary, must imply a revolutionary change in academic/professional content, scientific methodology, pedagogy, personal competencies, intra and extra organizational relations, technological delivery systems and administrative/ organizational systems.

This concept of pure market orientation is parallel to or derived from the idea of market orientation within business economics and strategic market management. According to this view, organizations must adapt their products, activities, culture and organization to the demands of the market in order to thrive and survive (Tellefsen, 1995; Duus, 1997; Jaworski & Kohli, 1997). In the case of e-learning development, it is thus the demands (or problems) of external stakeholders in the form of business firms that are supposed to govern a radical redesign of the total learning delivery system.

Problem orientation enters on two levels: First, by providing a strategic direction to the system design process and second, by guiding the virtual pedagogy in itself. The strategic problem management in connection with the design of e-learning systems can be described as a process of four steps. First, real-world problems in business firms are analyzed and identified. Second, the academic/professional content is redesigned on the basis of the identified problems. Third, this redesign becomes the basis for an adaptation of the pedagogy.

Fourth, the technological delivery system is chosen on the basis of the demands posited by the chosen pedagogy (Pettersson & Heede, 2000; Duus, 2001, 2002; Duus & Ehlers, 2002, 2004; Pettersson, 2005).

The market-based paradigm does not reject that academic/professional content, pedagogy and technology are important factors to consider in the design of e-learning systems and processes; however, these factors are subjugated to the factors that must be taken into account in the adaptation to market and business demands.

Consequently, the market-based paradigm is characterized by an orientation to demands external to the organization and by the conscious change based on those demands. When it comes to its application in university institutions, the market-based paradigm advocates nothing less than a radical restructuring of the total research and educational system. When it comes to application in business firms, it calls for nothing less than an environmentally dependent restructuring that is just as radical.

In other words, whereas the pedagogical paradigm takes a reformist stance, the market-based paradigm takes a revolutionary stance.

According to this paradigm, e-learning is no longer just another way of delivering education, but is instead the road to a totally different perception of learning, where e-learning influences more than just education. Rather, a radical restructuring of all educational institutions and firms is called for. Organizations that miss the opportunity to adapt are supposedly perceived as unfit to survive globalized competition, which will influence educational institutions and firms alike.

The market-based paradigm, which has several weak points, is first of all distinctly radical, and proponents may find it hard to win acceptance and approval. This weak point impedes implementation and also implies that work within the paradigm is perceived as having less merit, and in some cases, as being unethical. A comparison can be made with the problems - more or less well known - experienced in business when attempts are made to transform organizations in the direction of more market orientation.

Another weak point is that work within this paradigm is complex, ridden with tacit knowledge, and that the knowledge attained is difficult to spread. A third weak point is that the costs of development and transformation can be sizable. In this regard, the paradigm clearly distinguishes itself from the technological paradigm, which uses cost minimizations as a unique selling proposition. There is, however, nothing that indicates that the market-based paradigm should be more expensive in the long run (Duus, 2002).

A fourth weak point is whether political support can be gained for a paradigm which, in its essence, promotes the conscious adaptation to demands posited by markets and business firms. While some politicians and trade unionists may see this paradigm as bowing to libertarian values, globalized market-based competition nevertheless remains a reality that is hard to escape (Angell, 2000).

The typical proponents and representatives of this paradigm can be found in a few select public centers of research and education, and in a few larger corporations with their own training and education programs.

5. A Comparison of Differences between the Various Paradigms

The above paradigm descriptions do not follow the same overall pattern. An explicit comparison is shown in Figure 3.

Charac-teristics	The Technolo-gical Paradigm	The Content-based Paradigm	The Pedagogical Paradigm	The Market-based Paradigm
Central focal point in the design process	Technology	Content	Pedagogy	Markets/busi-ness/customers
Empirical form of appear-ance	Technology-based knowledge transfer e-learning	Content-based know-ledge trans-fer e-learning	Pedagogy-based know-ledge transfer e-learning	Market-based knowledge cre-ation e-learning
Develop-ment model	Primarily based on practical ex-perience	Based on practical ex-perience	Primarily the-ory-based	Primarily based on practical ex-perience and ex-periments
Organiz-ational form of appear-ance.	Evolutionary perspective with emo-tional focus on techno-logy	Traditionalist focus on ex-isting profes-sional and academic content	Reformist per-spective with focus on ped-agogy as hav-ing a specific intrinsic value	Revolutionary with focus on massive changes in the existing way of doing things and with needs and wants in markets and business as the guiding prin-ciple
Main suppliers and pro-ponents are found in the fol-lowing places	Firms pro-ducing learning technology	The majority of universit-ies, other learning in-stitutions and course pro-viders	Among aca-demic spe-cialists and researchers within ped-agogy, com-munication and organiza-tion	A select few companies and research and educational cen-ters (see pure examples of knowledge cre-ation e-learning in Figure 1)

Figure 3: A Comparison Between the Four E-Learning Paradigms.

An important key to understanding the differences between the four paradigms is, of course, their point of departure, or the central focal point in the design process, as it is called in Figure 3 [12]. Each paradigm is based either on technology, content, pedagogy or market/business as governing the e-learning design process. At the same time, the central focal point is of immense importance for the choice of development model and for the understanding of individual choice in the development process. This is shown in Figure 4, which depicts the design practice of each paradigm.

The Technological Paradigm	The Content-based Paradigm	The Pedagogical Paradigm	The Market-based Paradigm
Phase 1: Design of delivery system: The delivery system (primarily the technology) is designed	**Phase 1: Determination of content:** Content is determined on the basis of established and traditional academic/professional norms	**Phase 1: Determination of pedagogy:** The pedagogy is determined on the basis of ideas from pedagogy research	**Phase 1: Problem identification:** Real-world problems in business firms are identified
Phase 2: Content adaptation: The content (i.e. what needs to be learned) is adapted to the capacity of the delivery system to transfer knowledge	**Phase 2: Choice of delivery system:** The technological delivery system is chosen on the basis of what is to be learned (according to academic/professional norms)	**Phase 2: Content adaptation:** The content (i.e. what needs to be learned) is adapted to the chosen pedagogy	**Phase 2 : Content redesign:** The content (i.e. what needs to be learned) is redesigned in light of the identified business problems
Phase 3: Pedagogy construction: The pedagogy is constructed on the basis of the demands posited by content and the delivery system	**Phase 3: Pedagogy construction:** The pedagogy is constructed on the basis of the demands posited by content and the delivery system	**Phase 3: Design of delivery system:** The delivery system (including technology) is designed/chosen on the basis of the chosen pedagogy and content	**Phase 3: Pedagogy modification:** The pedagogy is modified in light of what needs to be learned (i.e. the content)
			Phase 4: Design of delivery system: The delivery system (including technology) is designed/chosen on the basis of the chosen pedagogy and content

Figure 4: The Design Practice of the Four E-Learning Paradigms

As shown in Figure 4, the choice of central focal point is important in the design process. It is not impossible that the success of each paradigm in creating and managing e-learning development is attributable to this choice. An example is found in the market-based paradigm, which to a large degree distinguishes itself from other paradigms by being the only paradigm that separates content and the needs and wants of users/buyers. The very

fact that in the market-based paradigm, development work is explicitly based on the needs and wants of users and buyers implies that success, measured as the ability to cater to the said needs, becomes more probable.

Empirically, a close connection between knowledge creation e-learning and the market-based paradigm, can be observed. In point of fact, wherever we observe knowledge-creation e-learning we also tend to find market-based development work. An explanation may follow from Pettersson (2002), one of whose central points is that efficient knowledge creation e-learning depends especially on user perceptions of the empirical and/or practical relevance of e-learning processes, which are enabled by a sharp focus on the empirical and practical reality of the academic/professional content. One important reason given is that participants will be very reluctant to partake in extensive virtual dialogs if they do not perceive that the practical problem being dealt with is relevant to their situation. This indicates that content should be designed with regard for the real world situation in which participants are to apply their knowledge. Thus, efficient knowledge creation e-learning would seem to imply that the real world situation of the participants must be taken into account by a market-based approach.

6. Strategic Implications of the Various Paradigms

The immediate usefulness of the above four-paradigm model lies in its ability to give users, buyers, (university) managers, public servants, politicians and investors a map charting the political landscape within e-learning, thus enabling knowledge of interest groups and design models. This can help decision makers to make better and more informed choices on the strategic development of e-learning.

An important fact concerning the above depiction of the four paradigms is that no objective e-learning expertise or knowledge exists. Each of the four paradigms expresses a distinct political reality, implying that it is misleading when certain supposed e-learning experts pretend to pursue "objective research".

However, the Randian view may be advanced that the market process constitutes an objective reality to which all individuals and organizations may sooner or later need to adapt (Angell, 2000). For this reason, a purpose may be served by evaluating e-learning research and development activities on the resultant practical effects in connection with the development and management of e-learning processes. A natural implication is that e-learning development will become closely associated with the mode 2 idea of knowledge production (Gibbons et al., 1994).

Further, it must be stressed that since the four paradigms are easily associated with plainly recognizable interest groups, the empirical correspondence of the above four-paradigm model can be estimated to be rather high (again, see Figures 1 and 3).

An important feature of the four-paradigm model is that it has a recursive organizational logic meaning that it works on several organizational levels. As such, the model does not just identify interest groups that are institutionally and commercially distinct. Thus observations suggest that the same organization can encompass several attitudes, notions and groups belonging to each of its paradigms. For example, Copenhagen Business

School and the A. P. Møller-Maersk Group are examples of a university and a large corporation respectively, which house different notions and interest groups, each with its own position on e-learning development.

Apart from the descriptive possibilities in distinguishing between the four paradigms, the four-paradigm model suggests several normative areas of application. These areas all have one thing in common, namely, an increased opportunity to focus efforts by choosing one decisive paradigm in the development of e-learning. Thus, by distinguishing between several levels of aggregation, the following four different normative areas of application can be identified:

1. **The organizational level: The opportunity to create a focused e-learning strategy for each organization**. Distinguishing between four paradigms can enable a harmonization of vision, mission, goals, notions, strategy and the strategic allocation of resources within each organization (which of course includes firms and learning institutions alike). An organization can thus choose among an agoristic, a pedagogistic, a technologistic and a scientistic development strategy by harmonizing responsibility, personnel, departments, goals, resources, etc. respectively along the market-based, the pedagogical, the technology-based and the content-based paradigm.

2. **The network/inter-organizational level: The opportunity to enter into strategic alliances within the field of e-learning**. It is striking that to this day, no examples exist of long-lasting cross-paradigmatic forms of cooperation. However, examples exist of suppliers working within the technological paradigm who have sold equipment to representatives of other paradigms. They should not, of course, be counted as examples of a deeper strategic cooperation. A strategy of building intra-paradigmatic alliances seems to be preferable.

3. **The national/transnational level: The opportunity to create a harmonized national/EU e-learning policy.** While politics have been said to be the "art of the possible", the implicit and explicit opportunities connected with a harmonization of goals, notions, national/EU strategy and national/EU allocation of resources should not be overlooked. Denmark, which may serve as an example, follows a national e-learning policy, which is essentially inspired by a mix of the technology-based and pedagogical paradigms. The adoption of a national policy or an EU policy based entirely on the market-based paradigm could provide a significant boost to innovation.

4. **The science/methodology level: The opportunity to create a common language concerning e-learning so that the ongoing confusion of widely different ideas of how e-learning should be researched and practiced are removed from the debate.**

An important element connected to the strategic and political choice of paradigm is how well each paradigm pushes the frontier of development, i.e. which paradigm works best in developing the field of e-learning. This vital question can be answered in two ways, first, by looking at how each paradigm may follow as a natural choice from given stated objectives, and second, by considering the performance of each paradigm in an absolute sense, i.e. what has been known to work best so far.

If, for example, on the organizational level, aspirations and ambitions are low and decision makers just intend to "electrify" existing education, i.e. if an electronic correspondence school is the only ambition, then the content-based paradigm and a scientistic strategy will be the obvious choice. If, on the other hand, high-level pedagogy-based e-learning within the existing academic system is the objective, then the pedagogical paradigm and a pedagogistic strategy seem preferable.

If the ambition is to support business learning processes through the provision of inexpensive and efficient teaching, then the technological paradigm and a technologistic strategy are the relevant choice. However, if what is called for is a thorough change in the total system of knowledge production according to the needs and wants of business, then the market-based paradigm, and consequently, an agoristic strategy, is the relevant choice.

It is remarkable that results by and large have followed the levels of ambition, since the cutting edge within e-learning is pushed along by the best suppliers within the technological and the market-based paradigm. The most radical approach is without doubt the market-based paradigm and this also seems very promising when it comes to results. One strong argument in support of a market-based paradigm emerge from the simple fact that advances should be beneficial to users and buyers. If results are gauged accordingly, an approach built on the needs and wants of users and buyers would naturally emerge as promising. This calls for an agoristic development strategy.

The million dollar question appears to be what such an agoristic strategy should look like? This author has developed e-learning solutions for years within the market-based paradigm and is able to draw extensively on personal experience when suggesting the components of such a strategy. There are several aspects too detailed to outline in a comparatively short article like this (Pettersson 2002, 2008). However, empirical observations by this author suggest that the following seven tenets in Figure 5 may constitute the foundation of a general agoristic strategy that may lead to the development of advanced e-learning solutions within a market-based paradigm (Duus, 2002; Duus & Ehlers, 2002, 2004). The crux of the strategy is that all efforts (be they innovative/experimental or administrative/controlling) should be subjugated to externally given needs and conditions.

Tenet	The Agoristic Strategy for E-Learning Development in University Institutions and Larger Firms
1	**Use the skunk works principle**. Establish separate autonomous units in the organization and give them the task of developing e-learning processes, courses and programs. Do not attempt to integrate e-learning into existing educational programs unless they are managed and developed by such units. Do not use "experts" who do not take part in the day-to-day development and management of e-learning processes. Do not separate development from the practical day-to-day business of running processes, programs and courses.
2	**Take market orientation to the extreme**. Any development should be based on a consistent buyer or user orientation. Preference should be given to the needs of buyers. The boundaries and barriers between buyers, users and suppliers, between faculty and students and between academic and professional learning must be eliminated. "Experts" with a vested interest in demanding special attention to technology, pedagogy and/or content over the needs of buyers and users should be ignored.
3	**Take in-sourcing to the extreme**. The thought of dividing organizational functions into smaller slices that can be hired from outside the skunk works unit must be disregarded. Most development must take part inside the unit to take full advantage of possibilities arising from the building of a common culture based on tacit knowledge and distinctive competencies. ICT support, administration, pedagogy and professional/academic development must work together as a whole under the same management.
4	**Innovate inside out**. Focus on resources and the gradual building of distinctive competencies. Spread knowledge creation e-learning to other units inside or outside of the larger organization by relationship building and relationship marketing. Teach e-learning as a practical thing by e-doing and advising. Lecturing on how-to-do activities (like e-learning) that involve tacit knowledge is a futile exercise. View the skunk works unit as a growing competence cluster inside and outside of the larger organization.
5	**Innovate through experimentation and experience-building**. Use action research, action development, experimentation and experience-building to build inter-personal and individual tacit knowledge and competencies. Do not waste too much time on attending conferences and lectures on e-learning or on reading books and articles on the subject. Remove boundaries between work functions. Breakdown the barriers between academic and professional learning.

6	**Use virtual problem-orientation**. A problem-oriented methodology should be used to facilitate virtual learning processes. It is impossible to facilitate efficient learning without an effective interpersonal dialog. However, this necessitates an orientation towards relevant business problems, which in turn necessitates a data orientation and a meta-methodological orientation. Important personal competencies are not the traditional competencies held by personnel with a background in pedagogy and communication but rather competencies held by people with a background in analyzing and handling data, information and knowledge within the areas of content production, ICT and administration.
7	**Combine innovation with tight administrative and management control**. An innovative culture must be developed in the skunk works unit, but such a culture must thrive within the constraints imposed by a tight administrative and financial controlling of activities. Attention to even the smallest details and performance management must exceed that which is considered normal by common standards. A paradox is obvious since popular knowledge on organizations claims that innovative organizations must be structured as "flat", "organic" and/or "soft". However, empirical observations of innovative companies reveal that this combination of opposites is both possible and beneficial.

Figure 5: The Seven Tenets of an Agoristic E-Learning Strategy.

7. Conclusion

The mapping of the field of e-learning presented above may be criticized for polarizing the field into different camps of suppliers and for giving a much too biased perspective on the various interest groups within the field. However, it must be noted that this polarization already exists, as illustrated by the heterogeneity of the field. As a result, this article is nothing more than an attempt to map the field without resorting to the usual technological, pedagogical or superficial market analytic bias.

Mapping the field will result in ideal types, which to a greater or lesser degree will resemble the real world. If the real-world correspondence is found to be small, the Weberian proviso exists that ideal types are only a way to structure reality by emphasizing certain central aspects in a pure form, thus creating yardsticks against which to measure reality. If, on the other hand, real-world correspondence is high, hence resulting in paradigmatic distinctions that easily find their correspondence in existing interest groups (as in this case), then a high probability exists that this model is correct.

Interestingly, the normative implications exist independently of whether the model is fully correct. The point here is that the four strategic implications of the harmonization of organizational and national e-learning strategies, the creation of strategic alliances and the creation of a common language are independent of the correspondence of the ideal types to real-world interest groups.

Further research in this direction is advisable. For one thing, this article has shown that the field of e-learning can be systematically mapped by using insights from economics and sociology. In this way, this article distinguishes itself from most other literature on e-learning by its approach as well as in its conclusions. While most mainstream research within the field of e-learning has been founded on insights from pedagogy, communication, organization and an incorrect application of market analysis, this article has, in contrast, outlined a potential different approach.

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[1] The Abellian definition is superior to the Porterian for several reasons. The Porterian definition posits that the industry consists of those firms that share the same market. This implies a close connection between the market and the industry and by further implication, quite a bit of closed-loop thinking. In contrast to the Abellian definition, the Porterian industry definition consequently does a poorer job of handling differing needs, wants, customers, competencies, technologies and knowledge, all of which can inspire dynamic and entrepreneurial thinking to transcend the existing competitive situation. Thus, according to the Porterian definition, a firm that is equipped with superior competencies, knowledge, and technology faces the same competitive situation as less well-equipped firms. The Abellian definition, in contrast, recognizes that superior firms are in a class of their own (Pralahad & Hamel, 1990). Taken to the extreme, the Abellian position is open to the possibility that an industry may consist of only one unique firm possessing superior characteristics, as is found in the economic theories of Schumpeter, Penrose, Kirzner and their followers. In general, the Abellian view on competition is in better accordance with economic theories focusing on economic change, innovation, resources, knowledge and competencies (see, for example, Duus, 1997). Also, modern strategy theories such as Kim and Mauborgne's (2005) "blue ocean theory" are in complete accordance with the Abellian view. This critique of the Porterian view can be upheld despite the fact that the Porterian view has changed considerably over time (de Man, 1994).

[2] The term "knowledge creation e-learning" was first proposed by Michael Pettersson (personal communication) in the year 2000. Knowledge creation in this sense differs from the use of the term in the research literature on knowledge creation (see, for example, Nonaka & Takeuchi (1995)) in that it focuses on knowledge creation in virtual networks, has a practical slant due to being developed under mode 2 conditions (Gibbons et al, 1994) and uses action research as proposed by Baskerville & Wood-Harper (1996a, 1996b), Itoh (1996) and Gummesson (2000). The distinction between knowledge creation e-learning and knowledge transfer e-learning can be criticized for not being rock solid in a rare number of instances where knowledge transfer e-learning can lead to knowledge creation e-learning, and where knowledge creation e-learning delivery systems make use of knowledge transfer e-learning systems. However, in the first instance, knowledge creation does not happen during the actual use of knowledge transfer systems, but much later. In the latter instance, knowledge creation e-learning can be seen as an extension of knowledge transfer e-learning, i.e. as the next (r) evolutionary leap forward. Thus, the relevance of this distinction remains valid.

[3] "We suggest that action research, as a research method in the study of human methods, is the most scientifically legitimate approach available. Indeed, where a specific new methodology or an improvement to methodologies is being studied, the action research method may be the only relevant research method presently available" (Baskerville & Wood-Harper, 1996a p. 240).

[4] Jacobsen (2002) gives an exact and precise description of the situation experienced by many: "During this period the media frequently printed articles, interviews and opinion pieces on e-learning and virtual teaching. Being in the midst of a practical application of the aforementioned, this was a curious experience. Few if any of the people, sounding off on the subject, had ever spent an hour teaching virtually. It is a demanding craft, requiring a hefty investment in hours devoted as well as money spent" (Jacobsen, 2002 p. 183).

[5] According to the Abellian analytical framework, most so-called "e-learning firms" are just producers of learning technology. They are in fact nothing more than suppliers of ICT to buyers and users of e-learning, implying that they have been unable to appropriate the huge profits expected from e-learning. In spite of numerous projections of excessive market growth, the dot.com crisis has hit the so-called "e-learning firms" just as hard as most other ICT firms. Real e-learning firms can be identified as larger companies and academic centers with their own educational programs. The profits expected from e-learning have by and large been realized as gains in innovation and efficiency in these entities.

[6] This research method is thus derived from Weberian sociology. It could not be any different, since the goal of this article is to identify a systematic pattern in subjective choices and resulting empirical forms of expression. It could follow other traditions within sociology, but in order to be consistent with the chosen problem, it serves no purpose to see e-learning development as being rational-contractual (Tönnierism), evolutionary (Spencerism), governed by coincidence, specialization or differentiation (Dürkheimism) or governed by materialist-historical forces (Marxism).

[7] Many suppliers focusing on learning rather than teaching seem to follow several varieties of constructivism (for example, the programs and models developed by Piaget or Vygotsky). It may thus be possible to see the degree of learning orientation as expressive of an implicit constructivist mental framework. This connection is far from unambiguous

since knowledge creation suppliers tend to use a mix of constructivism and realism, maintaining the existence of an "out there reality" while at the same time encouraging participants to do a creative search for problems and solutions.

[8] Production orientation implies the use of an inexpensiveness argument. Product orientation implies the use of a quality argument. Market orientation (not to be confused with marketing orientation or the marketing concept) is a varying characteristic of all firms. Even quite product or production oriented firms are market oriented – albeit not to a high degree. See Duus (1997) for an overview of the various company orientations toward the market place.

[9] As previously mentioned (see Figure 1), a knowledge creation e-learning solution implies more areas of application than education alone.

[10] Several institutions working within this paradigm have even used the lack of interactivity in their advertising. A testimonial on the homepage of one of the largest institutions had a student claiming that the program could be recommended because students were not distracted and burdened by dialog.

[11] An academic supplier using e-learning in its educational programs may thus see students as part of the product and business firms as end-users hiring students after completion of their education. This does not preclude seeing students as users and giving equal attention to their needs.

[12] Note that the four paradigms loosely resemble Weber's (1949) four "rationalities". The market-based paradigm is thus expressive of "goal" rationality, the pedagogical paradigm is expressive of "value" rationality, the technological paradigm is expressive of an "emotional" rationality and the content-based paradigm is expressive of a "traditional" rationality. (See Rangstrup (2000), who succeeded in building a corresponding Weberian model of competitive strategy). The four rationalities can also be depicted using the paradigms "organizational form of appearance" in Figure 3. As displayed in Figure 2, this paradigm model resembles the RISC model known from market analysis. However, it is only a resemblance. The theoretical basis is entirely different and the complex measurement problems that characterize the RISC model do not exist here. It is, for example, in most cases, not a problem to evaluate and conclude on the paradigmatic relationship of individuals, real-world interest groups and organizations.