Dynamic Education Webs – Expert Questionings, Scenarios, and Recommendations

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Abstract

Contemporary lifetime learning concepts require permeability between higher and further education. Today, human resources development is a critical success factor in a global environment. Shorter innovation cycles and the challenges of the service economy imply the alignment of further education concepts to the employees' working situation. Standardized contents are no longer sufficient to meet the needs of both learners and companies. Public and private education providers have to collaborate to meet the customers' learning needs. The providers can establish dynamic business webs – so-called dynamic education webs – in this collaborative process. These partnerships are temporary in nature and are based on incentives instead of contracts. We will focus on this new phenomenon and present research results with high practical relevance. The core questions arise: What promotes dynamic education webs? Who are the key players? What are critical success factors? These questions are answered based on literature and expert questionings of important market players. The recommendations derived can help the management to participate successfully in dynamic education webs. A glance at trends and market potentials as stated by the experts concludes the paper.

1   Introduction and Motivation

1.1   Current Status and Motivation

An in-depth investigation into the education market shows increasing numbers of temporary partnerships between public and private partners. We will call these partnerships dynamic education webs as an emerging phenomenon in the (further) education market. They are driven by practical needs. Currently they are based on fragmented, unaligned provider initiatives which we will outline in this paper.

This emerging dynamic education web phenomenon affects both public and private further education providers (Voigtländer & Breitner 2006). Strategic alliances with long-term contracts turn into dynamic networks of partners in the further education market. The main motivation is to react flexibly to short and mid-term customer learning needs. The further education market can be characterized as fragmented. Private and public further education providers focus on their well-known target groups, mainly employees in the private sector and scientific staff in the public sector. Private and public education providers compete for market share. The further education market consolidates since 2005. For learning content with topics like business skills

and IT trainings revenues are forecasted to increase approx. 3% in 2006 (Lünedonk 2006). Recent research shows an increasing market potential especially for e-learning contents and services (MBB Studie 2006). The providers in the further education market diversify rapidly. This is due to the increasing further education individualization (BMBF 2006, p. 8) and the increasing IT penetration of public and private further education providers. E-learning competence centers in universities or virtual corporate universities are examples for this.

The diversification of customer requirements drives the diversification of the providers. Shorter innovation cycles, the lifelong learning action program (http://www.bmbf.de/en/411.php) and a positive learners' attitude towards e-learning (BMBF 2006, p. 211) affect this diversification. Until now the predominant supply-side focus of further education providers evolves into a more customer-focused approach. A single education provider cannot handle the delivery of customer-specific further education programs. The 'make' decision in terms of supply-side, monolithic content production becomes less important in comparison with the 'buy' decision in terms of selected modular contents provided by specialized providers. Dynamic education webs require other provider role models. Information/communication, particularly e-learning technologies support the value creation activities in the chain and function as a critical enabling infrastructure.

Dynamic education webs imply that public and private further education providers cooperate increasingly. The providers focus on the sustainability of their product portfolio. This requires the ability to adapt to the permeability between higher and further education in the context of lifetime learning. This is described in Sec. 2.1 in detail. Further education providers have to focus on their core competences and modularize their e-learning portfolio. Customer-orientation then means to build a customer-specific modular further education program with contents and services delivered by selected partners in the dynamic education web. Dynamic education webs enable the providers to address new or additional target groups, see Table 1. Public and private education providers have to develop new business and role models to operate profitably in this competitive environment.

Providers	Primary target groups	Information systems for …
Private	Corporate learner Individual learner Company-external learner	Integration global learner community Support decentralized learning organization Process optimization
Public	Students Academic Staff	Administration increased number of students Lecture quality improvement Process optimization

Table 1: Providers, primary target groups and information systems

The paper describes the essential results of expert questionings with 39 interviewees from public and private further education providers. Critical success factors and common pitfalls for providers in dynamic education webs are discussed. The results also show changing roles and business models in the further education market. Future challenges for both public and private providers and the role of e-learning technologies are also discussed.

Relevance for the e-science area E-Learning

The paper focuses on e-learning technologies in further education. Lifetime learning concepts affect increasingly the working and learning reality of individuals. Associated with this is the transformation of further education providers' processes, services and products. The paper presents empiric results together with examples of real-world companies. We address the target groups decision makers of public and private further education providers who plan to engage in or are already engaged in dynamic education webs and HRD managers interested in emerging trends in the further education market, especially in German-speaking countries.

1.2   Paper Organization

Various customer requirements and innovative IT concepts needed to establish dynamic education webs are widely undocumented. Initiatives of public and private further education providers are still a local phenomenon. We use a multilevel deductive research approach, here. Figure 1 illustrates the organization of the paper.
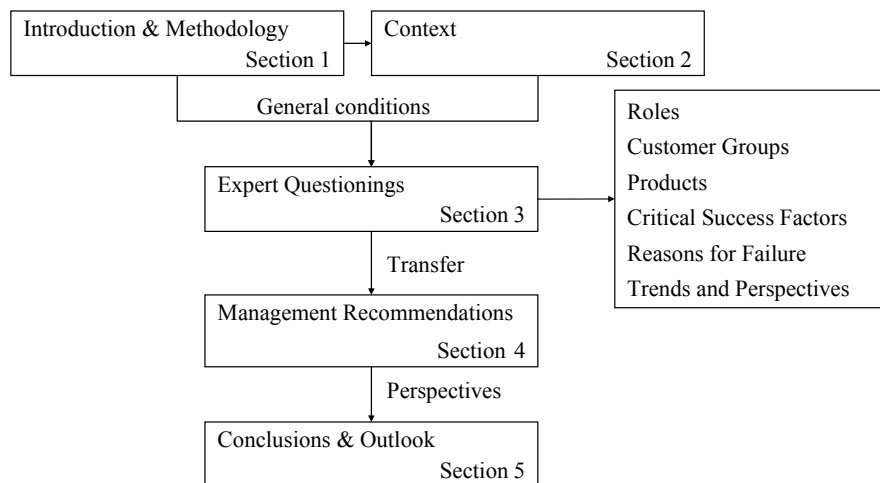

Figure 1: Paper organization

The introduction in Sec. 1 provides a snapshot of dynamic education webs and a motivation. Sec. 2 details the general conditions that stimulate the development of dynamic education webs. Lifetime learning concepts and information/communication technologies and systems are highlighted.

Dynamic education webs as an emerging phenomenon are currently not sufficiently understood. Therefore the authors conducted expert questionings.

The methodology and essential results, e.g., experts' experience, the role of information/communication technologies and critical success factors, are lined out in Sec. 3. The results are transferred into recommendations, e.g., for the management of public and private further education providers, see Sec. 4. Sec. 5 provides the conclusions and an outlook on further research activities.

2   Context

2.1   Lifetime Learning

In order to maintain a competitive advantage, a company has to keep up with product innovation lifecycles. The continuous investment in Human Capital is an indispensable necessity in a global competitive environment. Learning on demand concepts replace traditional learning concepts. Learning and working intertwines. Figure 2 explains this phenomenon comparing traditional and future learning scenarios. Permeability between higher and further education in the context of lifetime learning requires the modularization of curricula (Voigtländer & Breitner 2006). E-learning technologies are a critical enabling infrastructure particularly with regard to near-the-job further education. The e-learning information/communication technologies that support bachelor and master study courses are – especially in German speaking countries – not yet sufficiently mature for enterprise deployment.

The learner types are supposed to change in the near future. The traditional learner graduates with a bachelor or master degree and starts a career in a company. He/she normally attends corporate further education programs and is no longer 'customer' of a university. An emerging learner type graduates with a bachelor degree and enters work life. This learner type typically participates in corporate further education programs. After a period in professional life this learner attends a part-time master degree program on a university. The learner benefits from e-learning technologies because of the more flexible learning process. Companies value part-time programs, and offer them in employee retention programs. The increasing investment in a corporate e-learning infrastructure is an important part in this (MBB Studie 2006). E-learning technologies enable the usage of modular multi-purpose learning contents and services which can be re-combined in various learning scenarios. The flexibility to re-combine learning contents and services is an essential precondition to offer attractive further education services and products for emerging target groups. Emerging target groups are working mothers (refer to the 'Karrierezeit' initiative: http://www.karrierezeit.de), and employees interested in joint academic private sector research. Learning and working phases intertwine. Currently public and private further education providers offer only a limited further education product portfolio to these emerging customer groups. On the one hand public providers have to strengthen their credibility in order to enter the market (Schwertfeger 2006) successfully. On the other hand they own an immense body of knowledge reusable for further education services. Public universities intend to strengthen their market position and build up the further education product portfolio besides research and teaching (Zöllner 2003, p. 274). Newly founded e-learning competence centers illustrate this trend. The global availability of e-learning contents forces the players in the market to compete in a global environment. Especially public universities in German speaking countries have to compete with international business schools or universities offering an English curriculum with English learning contents and services. Many multinational companies located in German speaking countries use English as the corporate language. They prefer the cooperation with internationally oriented further education providers.

The cooperation with universities based in German speaking countries plays only a minor role. The expert interviewees emphasize that this is due to problems in the essential value activities of the public providers, see Sec. 3.2.
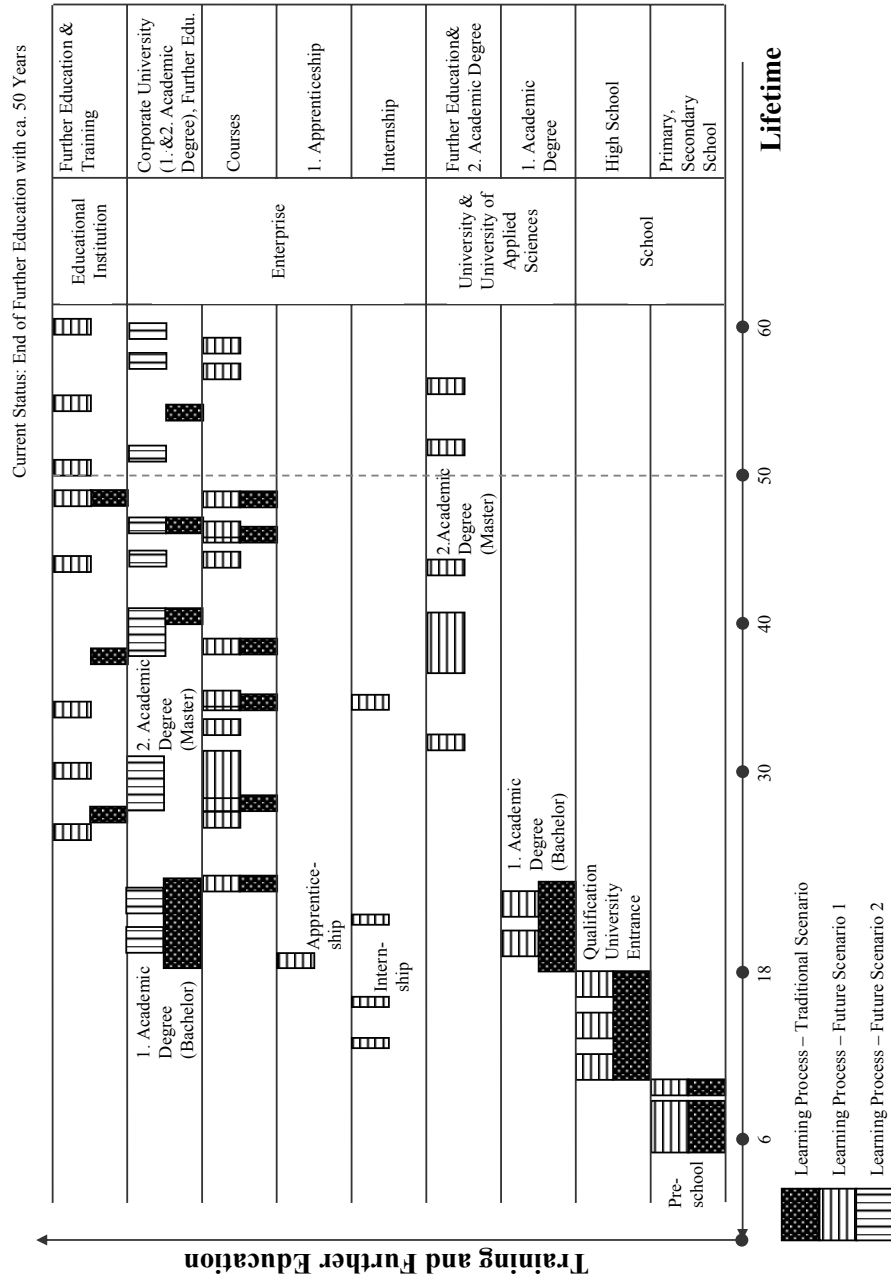
Figure 2: Lifetime learning – traditional and future learning processes and scenarios

2.2 Emerging Dynamic Education Webs

Dynamic education webs are a relatively new phenomenon. They originate from education providers' initiative in education brokerage (Koskinen 2004), learning services providing (Kraemer & Sprenger 2000, p. 36) and strategic alliances in the e-learning market (Clarke & Hermens 2001, p. 256). Further education alliances as middle- and long-term cooperation can be observed between corporate universities and public universities. A more dynamic nature of cooperation originates from the increased customer- and quality-orientation. The expert questionings' results in Sec. 3.2 document this shift in the further education market.

Customer needs mainly drive the temporary cooperation of partners in dynamic education webs which demonstrate the shift from supply to demand orientation. Public and private further education providers offer a joint further education services and products portfolio in a dynamic customer-oriented market. They aim at new market segments and synergies inherent in this. Public and private education providers have to develop new business models to operate profitably and grow their market share. Education providers as well as companies delivering further education have to focus on efficiency to justify educational budgets (Hoppe & Breitner 2006, p. 45). They also focus on sustainability of the offered portfolio. Dynamic education webs can be understood as economically and independent groups of companies and/or universities. Players in dynamic education webs generally intend to supplement their portfolios in order to cooperatively work on a joint value-added process (Wirtz 2001, p. 189). Public and private education providers focus on their respective core competences. They contribute high quality e-learning contents to modular further education programs. These programs are mostly not standardized. The modularization and re-combination of best-of-breed e-learning contents allow for a maximum of customer orientation. Associated with the customer orientation is the diversification of the further education market.

An increasing number and types of providers compete for the predicted market potential in the further education sector (Heise Online News 2003). Universities found competence centers for further education. This expansion of their original portfolio is supposed to raise new funds and attract new customer groups from outside the university. These include employees interested in supplementary academic qualifications. E-learning technologies, learning management systems and electronic contents promote learning on the job. On the other hand companies' personnel development departments, e.g., corporate universities, position themselves halfway between practice-oriented further education and academic qualification (Hilse & Nicolai 2004, p. 373). They offer certified degrees and accredited programs (Allianz Management Institute AMI Group 2003) and invest in their e-learning infrastructure (Bohl et al. 2005, p. 249). Public and private institutions compete for the same market share. Their education portfolios begin to overlap.

2.3 Role of Information/Communication Technologies

E-learning technologies enable an innovative further education concept for universities and companies. "E-learning refers to the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance" (Rosenberg 2001, p. 28). Stand-alone e-learning infrastructures, learning management systems, via CD-ROM distributed e-learning contents, computer-based trainings etc. are considered outdate. Up-to-date e-learning solutions are integrated in organizational and personnel administra-

tion processes. They are supposed to correspond to the convergence of learning, knowledge, competence and personnel management systems, see Figure 3. Emerging e-learning solutions include the reuse of modular learning contents and require e-learning content supply chains without media conversion. Figure 3 shows a typical e-learning framework applied to corporate and academic learning environments. In dynamic education webs companies and universities can be both e-learning providers and customers. They are part of the e-learning supply chain, receive e-learning contents delivered by public or private e-learning providers, re-combine e-learning contents and resell them on the further education market. The learning management system can be understood as an essential infrastructure supporting most learning processes. It comprises optional modules e.g., content management, participant management or reporting. Social software components like wikis, chats or virtual classrooms, supplement the functional range. They allow integrated communication processes in complex e-learning scenarios.

A customizable roles and rights management concept in a learning management system ensures that the learners can access personalized curricula with e-learning contents and services. The learning contents and services administration in a learning management system facilitates the administration of presence-based events too. Blended learning stands for the combination of technology-supported contents and services with presence-based events. Content tools as stand-alone solution or (partly) integrated authoring tools support the e-learning content creation. In a standardized learning environment they often conform to the guidelines of learning technology standards. The most common standards are AICC (Aviation Industry CBT Committee, http://www.aicc.org), SCORM (Sharable Content Object Reference Model, http://www.adlnet.gov/scorm/index.cfm) and IMS standards (Global Learning Consortium specifications, http://www.imsglobal.org).
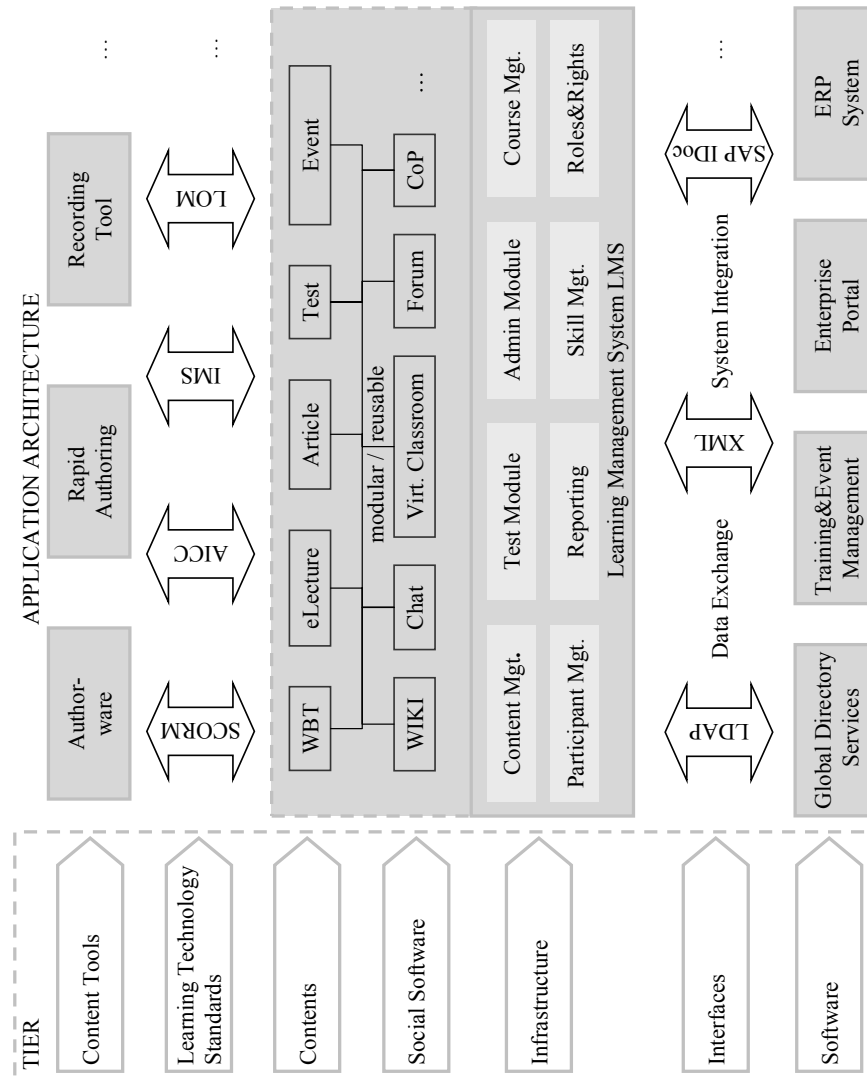
Figure 3: E-learning framework

A learning management system is a part of the corporate IT infrastructure. The processes supported by the system are not limited to the core personnel development processes. With interfaces to other systems administration processes can be automated, additionally. Examples include: Learners' data synchronization between the learning management system's database and a global directory or event booking information transmission to an event management system. The implementation of a single sign-on and integration of learning solutions into an employee portal support integrated IT processes. The integration of the learning management system CLIX® into the Microsoft® SharePoint Portal Server is a good example of this trend (imc AG, 2006). Another emerging trend is the convergence of learning, knowledge, competence and personnel management systems. Integrated systems also promote dynamic education webs and support the further education supply chain. In the following we will refer to this integrated e-learning approach.

3   Expert Questionings

3.1   Methodology

The expert questionings are an integrated part of a long-term study. It aims to prove the concept and practical relevance of dynamic education webs. The authors have been interviewing selected experts from public and private further education providers. These include private institutions, e-learning companies, and public further education initiatives. The current geographical focus is German speaking countries. This is due to a similar learning culture and comparable roles of public and private provider. In a later phase the results will be compared with common scenarios in other learning environments, especially in English speaking countries. The interviewees in the representative sample are personally contacted via email. 93 experts are asked for a phone interview, 47 experts (51%) agreed to take part and have already been interviewed: 21 interviewees (45%) from public, 26 (55%) interviewees from private further education providers. 46 contacts (49%) denied an interview for various reasons or have not given feedback. The detailed list with all experts will be provided by the authors on request.

The qualitative phone interviews are based on a standardized interview guideline. It focuses on players, customers, critical success factors, common pitfalls, trends and perspectives for further education providers in dynamic education webs.

3.2   Main Results

The results are described using the interview guideline structure. 19 of the interviewees (49%) describe their *role* respective experience in a dynamic education web as provider, 1 contact person (3%) as customer and 15 (38%) as provider and customer. 4 interviewees (10%) have no practical but research experiences in dynamic education webs. Public and private further education providers cooperate with a broad range of *partners in the network*, see Table 2.

Public partners	Private partners
• Federal institute for education & training • University • University of Applied Sciences • University of Cooperative Education • Vocational institute	• Association • Business school • Chamber of commerce and industry • Consulting company • E-learning provider • (Executive) coach • Human resources development • Professional training provider • Publisher • Research institute • University • University of Applied Sciences

Table 2: Public and private partners in dynamic education webs

Public institutions often prefer public partners, private providers vice-versa. Interviewees from public and private institutions emphasize that they would appreciate the cooperation with other partners. But a similar organizational culture, professional working attitude and the level of service orientation are often mentioned as reasons for this decision. There are still cultural differ-

ences. "Public universities would be attractive partners for a private business school; they own an immense body of knowledge" (expert No. 36). "As a public university we have only one chance to enter the further education market professionally: Private partners" (expert No. 20). *Emerging Customer groups* especially mentioned by public providers are small and medium-sized enterprises SMEs and university alumni. Interviewees of private providers and corporate universities aim to sell buyers of their core services and products e-learning as value-added services. Other target groups are SMEs in the same line of business and companies located in the same region, see Table 3.

Organizations as customers		Focus learner types
Public	Private	
• University • University of cooperative education • Vocational institute • Federal armed forces • Ministry • Public authority	• Chamber of c. and i. • Company • Corporate University • SME	• Alumni • Apprentice • Customer of companies' products • Employee • Health personnel • Manager • Salesmen • Student in developing countries • Teacher • Trainer • Working parents

Table 3: Emerging customer groups (public and private partners) and learner types

Contents and learning services particularly suitable for dynamic education webs have to be modular, standardized and of high quality. "Integrated learning curricula benefit from complementary competences of all concerned partners" (expert No. 28). Customer and service orientation linked with flexibility turn out to be the most frequently mentioned *critical success factors*, see Table 4.

Customer orientation (1st Priority)	Partner networks (2nd Priority)	E-learning (3rd Priority)
• Business process optimization • Corporate culture orientation • Guarantee practical relevance • Joint assessment of demand • Marketing best practices • Professionalism • Support during implementation	• Business confidence • Complementary competences • Contractual framework • Cost effectiveness • Flexibility • Precise responsibilities • Regional partners • Roles and competences • Scalability	• Customer IT infrastructure • Didactic concepts • Integrated IT solutions • Service-level agreements • Standardization • Transparent cost-benefit ratio • Up-to-date technologies

Table 4: Critical success factors and prioritization

"Partners in a dynamic education web succeed in the further education market only with the passion for customer orientation and the network itself" (expert No. 1). An essential result is that providers have to focus on roles and core competences. This affects the recommendations in Sec.4. 85% of

the interviewees expect a growing *market potential*. Indispensable prerequisites are professional business models, integrated e-learning services and the reputation of partners and the dynamic education web itself.

4   MANAGEMENT RECOMMENDATIONS

The recommendations focus on the core critical success factor *roles* and *competences*. This is the departure point that must be considered before entering the further education market. The results also demonstrate that universities have a visible academic profile but lack a distinct further education profile. This is essential for the visibility in the further education market and for attracting private sector companies as customers. Table 5 summarizes the results on suitable roles and core competences of selected further education providers.

Organization	Competence(s)	Role in education webs
University (public & private)	Profound research experience Academic staff Low cost structure	Syndicator Content provider
Corporate University	Close relation to practice Expert database Existing business network Affinity to research	Customer relationship management Content provider
Business school	Credibility Affinity to research	Customer relationship management Content provider
Content provider	Didactic expertise Tool competence Established clientele	Customer relationship management Broker Content provider
Publisher	Technical expertise Editorial process excellence Author network	Broker Content provider

Table 5: Core competences and promising roles in dynamic education webs

The recommendations focus on public and private universities. They can also be understood as selection criteria for companies searching for reliable academic further education partners. The immense body of academic knowledge in universities represents a promising competitive position from which to establish a further education portfolio besides research and teaching. A diligent and skillful build-up of this position is an essential prerequisite to exploit the first mover advantage. A possible approach is the foundation of an institute closely associated with the university. This is a proven model for a professional consulting services offering. It promotes networking activities with further education providers and supplements existing academic core competences. Alumni activities support practice-oriented, customer-focused learning contents. A diligent assessment of demand requires regular surveys and evaluation of customer needs. Alumni can also contribute learning contents in their field of expertise gained during their work experience. A universities' further education institute can deliver a customer-oriented and market driven portfolio.

Universities often lack an integrated e-learning strategy. E-learning initiatives often originate in past projects and base on a heterogeneous environment of differing infrastructures, tools, and standards. Interviewees in charge of university e-learning activities confirm this fact. Information/Communication technologies and systems should ideally follow an integrated strategy. The learning management system represents the foundation of an e-learning infrastructure. It supports the process of content creation or procurement, delivery and evaluation. Learning technology standards guarantee interoperability between learning management systems and learning contents, and the reuse of learning contents in various learning scenarios. This can be compared to a platform strategy: Learning contents can be recombined with standard trainings produced by partner e-learning providers. Thus learning scenarios are customized to meet the customers' further education needs. Universities with a distinct further education profile have to commit to a strong service-orientation. An attractive further education portfolio incorporates innovative academic services. Weekend lectures, advanced courses and summer schools in semester breaks, e-learning supported part-time degrees are attractive for corporate customers. Tutoring services and e-learning contents reconcile working and learning. A local strategy, i.e. network of local partners and local customers, appears to be especially successful. The pressure to establish partner networks will increase. The network participation is an essential prerequisite to bridge the gap between academic requirements and practical learning needs.

5   Conclusions and Outlook

Lifetime learning demands mainly drive dynamic education webs. Today public and private further education providers must face the shift from supply to demand orientation in a dynamic global market. We provide insight into this new phenomenon and show the practical relevance of the results. Core results explain what promotes dynamic education webs. Various business and academic needs drive the key players which come from the public and private sector. Critical success factors reflect the multifaceted motivations. Synergies in dynamic education webs can be realized, e.g., by attracting new customer groups and by growing market shares or a significant cost reduction. Temporary partners can offer learning services and products with profound academic and practice-oriented learning contents. E-learning technologies must facilitate the establishment of successful education webs and are a critical success factor. Learning near- and on-the-job is promoted. Standardization, modularization and certification allow the combination and reuse of learning contents independently of its original context. Today the value-creation potential inherent in (optional) dynamic education webs is not fully exploited. The expert questionings confirmed these results. Future research is needed to understand the new phenomenon dynamic alliances in further education better. The body of acquired knowledge is still limited. Ongoing research project results indicate positive customer reactions. There are almost no data available describing the actual demand for further education under these new circumstances. The data are an important prerequisite for the development of consistent business models. This correlates with the lack of structured research in terms of essential conditions and necessary adjustments to the business models of the market players. Future research activities have to focus on an integrated approach for dynamic education webs and particularly have to investigate the role of e-learning technologies. Based on the expert questionings' results the authors conduct further research with focus on e-learning business models for public and private further education providers.

References

BMBF Bundesministerium für Bildung und Forschung (2006). Berichtssystem Weiterbildung IX. Integrierter Gesamtbericht zur Weiterbildungssituation in Deutschland (In German). Retrieved October 25, 2006, compare http://www.bmbf.de/pub/berichtssystem_weiterbildung_neun.pdf.

Bohl, O., Höfer, A. and Winand, U. (2005). Nachhaltige Geschäftsmodelle für e-Bildungsdienstleistungen aus deutschen Hochschulen (In German). In: Breitner, M. H. and Hoppe, G. (Eds.): E-Learning. Einsatzkonzepte und Geschäftsmodelle. Physica-Verlag, Heidelberg, 241–254.

Clarke, T. and Hermens, A. (2001). Corporate developments and strategic alliances in e-learning. Education & Training (43) 4, 256–267.

Hilse, H. and Nicolai, A. T. (2004). Strategic Learning in Germany's largest Companies. Empirical evidence on the role of corporate universities within strategy processes. In: Journal of Management Development 23 (4), 372–398.

Hoppe, G. and Breitner, M. H. (2006). Evaluation and Optimization of E-Learning Scenarios. Zeitschrift für Betriebswirtschaft (ZfB), Special Issue 2/2006 „E-Learning Geschäftsmodelle und Einsatz-konzepte", 43–61.

imc AG (2006). Microsoft Deutschland und IMC AG entwickeln eine integrierte Lernumgebung auf Basis von CLIX® und dem SharePoint Portal Server (In German). Retrieved November 05, 2006, compare http://www.imc.de/homepage/unternehmen/pressearchiv/2006/PM2006-05-22_CLIX-Sharepoint_D.pdf.

Koskinen, T. (2004). Edubroker. Bridging the Gap between Universities and Companies. In: Proceedings of the 10th International Conference on Technology Supported Learning & Training (Online Educa), Berlin, December 1–3, 2004.

Kraemer, W. and Sprenger, P. (2000). Content und Learning Service Providing - ASP aus inhaltlicher Sicht (In German), in: Information Management & Consulting 15, special edition, 36–44.

Lünedonk GmbH (2006). Lünedonk Listen Weiterbildung. Retrieved October 12, 2006, compare http://www.luenendonk.de/download/LUE_Weiterbildung_2006_f270406.pdf#search=%22LUE_Weiterbildung_2006_f270406.pdf.

MBB Studie (2006): Corporate Learning 2006. Retrieved October 12, 2006, http://www.mmb-michel.de/2004/pages/presse/PR-downloads/MMB_PM_CoLe_20060315.pdf.

Rosenberg, M. J. (2001). e-Learning. Strategies for Delivering Knowledge in the Digital Age. McGrawhill, New York.

Schwertfeger, B. (2006): Meckern hilft nicht. Interview zu Bachelor-Akzeptanz (In German). Retrieved November 02, 2006, compare http://www.spiegel.de/unispiegel/jobundberuf/0,1518,418570,00.html.

Voigtländer, C. and Breitner, M. H. (2006). Dynamic Alliances in Further Education – Strategies to Increase Value Creation. In Breitner, M. H., Bruns, B. and Lehner, F. (Eds.): Neue Trends im E-Learning – Aspekte der Betriebswirtschaftslehre und Informatik. Physica/Springer Verlag, Heidelberg.

Wirtz. B. W. (2001). Electronic Business. 2nd Edition. Gabler Verlag, Wiesbaden.

Zöllner, J. (2003). Der Preis der Freiheit ist die Verantwortung (In German). In: Kilius, N., Kluge, J. and Reisch, L. (Eds.): Die Bildung der Zukunft. Suhrkamp Verlag, Frankf