

# CHALLENGES AND SUCCESS FACTORS FOR DISTANCE LEARNING ORGANIZATIONS TARGETING INFORMATION TECHNOLOGY PROFESSIONALS

Jelena Vucetic, Ph.D., MBA, Capella University, Jelena.Vucetic@worldnet.att.net

## ABSTRACT

*In the last decade, with rapid development and deployment of Internet-based applications, distance learning (DL) has emerged as a new paradigm in various aspects of education, including the academia, corporate training, certification programs as well as K-12 education. In this paper, we shall focus on the applicability of distance learning in the graduate education of information technology (IT) professionals.*

**Keywords:** Distance learning trends and market, Success factors, Distance learning platforms and applications, Distance learning programs

## INTRODUCTION

In the rapidly increasing trend of academia "corporitization" (transition of traditional universities into for-profit organizations offering education services, as well as emergence of new, for-profit, education-focused organizations), distance learning (DL) has demonstrated a tremendous potential for these institutions to make profit, while competing for students, funding, employees and other critical resources.

## MARKET OVERVIEW AND TRENDS

The focus of this analysis is the demand and challenges of distance learning organizations offering graduate programs to information technologies professionals. To achieve better understanding of the strategies that these organizations need to pursue, it is important to identify the profile and size of IT professionals market.

In 2001, U.S. universities conferred 25,509 doctorate awards in overall science and engineering fields, down from 27,283 in 1998 [2]. The data presented Tables 1 - 4 are obtained from the National Science Foundation report [2-5]. These data show trends in doctorate awards in high-technology fields that are most closely related to information technology, as well as post-graduation plans of recipients. Table 1 shows the trend of IT professionals pursuing a doctorate degree has been relatively consistent, with statistical deviation that has not exceeded 25% in the last 10 years. Tables 2 and 3 [4] also show that the number of non-US doctoral recipients is approximately double the number of US-citizens who have acquired Ph.D. in high-technology fields in the last 10 years. This international diversity of the market in our analysis is an important factor for determination the success of DL organizations.

Special consideration also needs to be made of the future plans of the doctoral recipients. In order to meet the needs of its market and better shape their "service offering", DL organizations need to understand why their students pursue graduate degrees and what they intend to do after their graduation.

**Table 1: Doctorates awarded in High Technology disciplines, between 1992 and 2001**

Field of Study	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Telecommunications	30	22	33	29	32	33	40	39	42	47
Computer	175	167	202	189	208	227	210	204	172	183
Electrical Eng./ Electronics	1,278	1,354	1,438	1,513	1,501	1,461	1,346	1,235	1,328	1,347
Computer Science	791	825	833	913	836	828	821	741	721	687
Information Science/Systems	78	55	70	84	84	81	106	114	138	83

**Table 2: Percentage distribution of Doctorates awarded in High Technology disciplines to U.S. Citizens, between 1992 and 2001**

Field of Study	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Electrical Eng./ Electronics	4.1	4.2	4.2	4.4	4.5	4.7	3.9	4.0	3.4	3.1
Computer Science	2.9	2.8	2.8	3.1	2.7	2.7	2.9	2.6	2.5	2.4

**Table 3: Percentage distribution of Doctorates awarded in High Technology disciplines to Non-U.S. Citizens, between 1992 and 2001**

Field of Study	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Electrical Eng./ Electronics	8.9	8.9	9.5	9.5	9.0	9.2	8.9	8.6	9.9	11.1
Computer Science	4.6	4.4	4.4	4.7	4.3	4.3	4.2	4.5	4.8	4.5

**Table 4: Percentage distribution of definite post-graduation plans of Doctorate recipients in High Technology disciplines, in 2001**

Field of Study	In the United States					Abroad	Location Unknown
	Total in U.S.	Post-Doc Study	Academic Career	Industry Career	Other		
Electrical Eng./ Electronics	97.5	8.1	11.1	64.6	13.8	2.0	0.5
Computer Science	98.6	10.5	38.2	41.2	8.8	1.4	0

Table 4 shows that a great majority (97.5% in Electrical Engineering, and 98.6% in Computer Science fields) of IT professionals stay in the US after their graduation. Most of them choose a career in industry (64.6% in Electrical Engineering, and 41.2% in Computer Science) [5]. A relatively high percent (38.2%) of Computer Science doctorants choose an academic career. The rest will either pursue post-doc studies, entrepreneurship, consulting, etc.

Based on these statistics, it is not surprising that most DL organizations emphasize the "scholar practitioner" approach in their programs [9]. In other words, these organizations prepare their graduate students for future careers primarily in industry, using case studies, practical exercises, team projects, development of leadership skills, critical thinking, total quality management and strategic framework.

## **DISTANCE LEARNING TRENDS**

According to U.S. U.S. Dept of Ed 1998 survey released Dec. '99 [7], 78% public 4-year and 62% public 2-year universities offered DL programs. 87% of all institutions had over 10,000 student enrollments. From 1995 - 98, there has been a 33% increase in institutions offering distance education, while number of DL courses and enrollments doubled. Internet and Web-based courses increased by 32%.

The following fields of study have been covered by graduate DL organizations, attracting high-technology professionals [1, 7]: Engineering (16% organizations), Computer Science (10%), Business and Management (30%).

As Internet and World Wide Web have opened doors for DL to many organizations and individuals, the whole graduate learning paradigm has started to change. The following trends have been determined in most programs:

- A wider range of student choices for education, including the scope, the delivery methods (e.g. online classes, directed studies, tutoring programs, online teams of peers, etc.), time flexibility and grading choices (letter grades, pass/fail, descriptive assessment, committee evaluation, etc.)
- Transformation from an institutional-centered to a learner-centered context for education
- Transformation from traditional universities into corporate-like organizations, many of them being for profit
- Transformation from traditional students into learners/customers
- Transformation from education provided by traditional, tenured faculty, to education provided by contract-based, consultant-like professionals that mostly come from industry
- Transition from theory-focused academic programs to the "scholar practitioner" educational model which combines theory with practical examples from industry
- Increased quality controls of educational programs, where learners/customers have an opportunity to evaluate the faculty and educational organization, as much as to be evaluated themselves in the pursuit of their degrees.

Information technology professionals expect from continued education: a) Strong focus on the material that is relevant to their field of study; b) Applicability of the subject matter to their career; c) Currency and effectiveness of the material; d) Flexibility of the programs; e) Responsiveness of the faculty and staff.

## **KEY SUCCESS FACTORS FOR DISTANCE LEARNING GRADUATE PROGRAMS FOR INFORMATION TECHNOLOGY PROFESSIONALS**

### **1. Organization Key Success Factors**

**a) Superior Brand Equity and Professional Image** - As any other economic entity, DL organizations need to establish a strong brand that will represent their mission, vision and strategy. Both traditional (mass advertising on TV, radio, newspapers and magazines, promotional offerings and discounts, articles and other publications, success stories, open houses, etc.), and non-traditional marketing strategies (online advertising, virtual tours, virtual demos, etc.) have been used to promote the organization's brand. However, ultimately the brand strength can be established and sustained only by consistent superior quality of education, offered to students at a competitive price.

**b) Superior Information Systems** - DL organizations need to invest substantial resources in their information systems, especially when they are focused on attracting information technology

professionals as their students. These information systems need to provide various kinds of information and services in a reliable, accurate, secure, safe, effective and efficient way. Starting from the academic organization's Web site, the information system needs to support several sets of Web-based application targeting: Prospect students, Current students, Prospect faculty, Current faculty, the organization's staff employees, Investors, and Community. For prospect students, the information system and Web applications should provide information on the academic organization, programs, enrollment, student loans and other financing opportunities, as well as the demo of the online classroom. Current students, in addition to the information provided to the prospect students, require effective, efficient and reliable access to their ongoing online classes, as well as fast access to their academic and financial records, and opportunity to enroll online for the next classes, purchase their textbooks, and pay any outstanding bills to the organization.

**c) Superior Distance Learning Platforms** - Courses are delivered over various learning platforms such as FirstClass, WebCT, Blackboard, Unilearn, Prometheus, WebTycho, E-College, E-Education, etc.

CHEST (the Combined Higher Education Software Team) is a non-profit organization with its headquarters at the University of Bath, UK, which acts as a focal point for the supply of software, data, information, training materials and other IT related products to the Higher and Further Education. Based on the information that has been provided by the suppliers of DL platforms themselves, CHEST has posted unedited Comparison Grid for the following major platforms and their respective suppliers []: Blackboard Learning System (Blackboard), learning environment (FD Learning Ltd), LearnWise (Granada Learning), Virtual Campus (Teknical Ltd) and WebCT Campus Edition Pilot (WebCT, Inc). The Comparison Grid offers comparative information for the following platform features: Product description, Type of license, Product support, Cost of product, Cost of training, Cost of maintenance, etc.

DL platforms typically include:

1. Learner Tools:
  - Communication Tools (Discussion forums, File exchange, Email, Online journal, Real-time chat, Whiteboard)
  - Productivity Tools (Bookmarks, Calendar, Online Help, Search within the Course)
  - Student Involvement Tools (Groupwork, Self-assessment, Personal Homepage, Student Communities)
2. Support Tools:
  - Administration Tools (Authentication, Course Authorization, Hosted Services, Registration Integration)
  - Course Delivery Tools (Automated Testing and Scoring, Course Management, Instructor Helpdesk, Online Grading, Student Tracking)
  - Curriculum Design (Accessibility Compliance, Course Templates, Curriculum Management, Course Customization, Instructional Design Tools, Instructional Standards and Compliance)

**d) Ability to Respond Quickly to Shifting Market Conditions** - In the increasingly competitive environment, DL organizations need to respond quickly. Even more, they need to be in a preemptive mode, thus being able to anticipate correctly the economic, political, social, technological and cultural changes - and adjust their strategy accordingly before these changes affect their business. For example, in the last couple of years, due to the substantial downsizing in high-technology industry, there has been a major shift in interest of IT professionals towards management. This trend shift has resulted in rapidly growing number of enrollments into MBA

and Ph.D. business programs. Many DL organizations have responded quickly offering various "technology management", "project management" and "entrepreneurship" programs, focusing on these senior IT professionals who want to leverage their technological expertise in business.

**e) Strong Customer Agreement** - As any other business, DL organizations want to establish strong, long-term relationships with their learners/customers. Many organizations offer full, accredited graduate programs, using the final degree as an incentive for the "loyal" learners. In addition, many organizations offer job placement services for their graduates, which may be a very attractive incentive especially in the period of economic crisis and corporate downsizing. Another form of establishing long-term relationships for these organizations is to get into an agreement with corporate, government or military entities, thus securing a large pool of long-term learners (corporate employees) who will be reimbursed for their continued education as a part of their benefits package.

## **2. Marketing Key Success Factors**

**a) Diversified Learner/Customer Portfolio** - DL organizations, as any other business entities in a competitive environment, need to ensure a diversified learner/customer portfolio without over-reliance on any one segment. Depending exclusively on individual learners or a single corporate contract involves higher risk to the organization, rather than having a diversified portfolio of multiple corporate accounts as well as numerous individual learners.

**b) Ability to Build Learner/Customer Loyalty** - By offering unique learning services, superior program quality and additional incentives, DL organizations should focus on increasing its ability to build learner/customer loyalty and reduce their churn. The most important challenge here is to truly understand the needs and expectations of individual learners and their employers. Educational programs need to be designed and delivered to fully meet these expectations, which will ultimately create and sustain learner/customer loyalty. For example, large high-tech organizations (such as Boeing, IBM, Verizon, etc.) have a very strong demand for highly qualified project managers capable of running their projects successfully. These high-tech organizations have been signing long-term contracts with DL organizations that have offered graduate project management programs, targeting senior IT professionals and preparing them for the career transition toward project management. DL organizations who recognize a substantial potential of these long-term contracts, focus on the high quality of their programs tuning it toward the specific needs of their clients (high-tech organizations).

**c) Ability to Offer Unique Solutions** - Successful DL organizations provide differentiated, unique solutions - weather it be converged solutions or a low cost alternative. For example, using a combination of Web-based applications, chat and/or email, it is possible to create smaller learning teams, thus offering both class-wide classes and smaller "lab" forums.

**d) Ability to Properly Articulate Value to Learner/Customer** - In order to provide effective education, DL organizations need to develop ability to properly articulate values to its learners. Instead of focusing on credits, grades, scores and points, most adult learners prefer focus on the subject matter and how it can help them in their pursuit of career goals. The main value that these learners expect is expertise in the field that they are exploring. Therefore, one of the major challenges for DL organizations is to ensure that they provide superior level of expertise to their learners.

**e) Courteous Learner/Customer Service** - In the pursuit of its positive image, DL organizations need to ensure courteous interface with all its stakeholders, including the learners, corporate representatives, faculty, investors, media, and community. Through courteous interface, DL

organizations reflect their competency, competitiveness, efficiency, reliability and professionalism.

**f) Breadth of Education Services** - DL programs need to reflect the demands and expectations of their market. As the market is not a homogenous entity, having multiple segments (individual, corporate, military, community), DL organizations need to offer a breadth of education services to meet these diverse needs. For example, educational services may be categorized by the form of the delivery: a) one-on-one (through directed studies, tutoring, advising); b) one-to-many (faculty teaching online classes with numerous learners); c) peer teams (online collaborative teams of learners formed to accomplish certain educational goals, such as a capstone project or report). Educational services may also be categorized by the discipline of studies, thus meeting more specifically individual needs of their learners. For example, some IT professionals in management programs may have specific interest in entrepreneurship, while others may prefer management in larger organizations, global enterprises, or consulting firms. The more breadth of educational programs the DL organization provides, the better will it address the learners' needs.

**g) Learner/Customer Guarantees** - Focusing on the quality of its programs, DL organization should be able to offer high guarantees to its learners and their sponsoring employers. By investing in their education, learners and their organizations expect to gain the superior expertise by the end of the educational program.

**h) Ability to Get New Education Services to Market Quickly** - As the demand of DL education for IT professionals is rapidly growing and changing, DL organizations need to be monitoring closely this market and responding quickly to any significant changes in the demand.

Implementation of multimedia DL platforms, or introduction of new programs focusing on state-of-the-art technology and literature are just a few examples.

### **3. Technology Key Success Factors**

**a) Service Reach** - DL organizations need to understand what the most effective ways to reach their students, especially if their target is international and global. Internet and World Wide Web are very widely used around the world these days, which means that DL organizations can technically reach their market worldwide. In addition to Internet access provided via terrestrial lines, newest microwave and satellite communications enable service reach very remote places, including airplane carriers and oil-drilling platforms around the world.

**b) Leverage DL Platform Supplier's Capabilities** - Through strong alliance with its supplier, a DL organization may leverage on the innovation capabilities that are embedded in the newest platform releases. For example, new platform features, efficiency and increased reliability may substantially improve the overall quality of a DL program.

**c) Capability to Use Internet for Various Business Activities** - In addition to providing DL services over the Internet, many DL organizations have developed numerous Web-based applications that enable online accounting for their employees, online contract acceptance by learners and faculty, online payments and enrollments, as well as access to various general and professional information residing in online libraries and other resources.

**d) Maximize Utilization Rates to Drive Economies of Scale** - By securing higher volumes of learners through long-term contracts (primarily with their employers), a DL organization may substantially improve the utilization rate of its resources, which improves its economies of scale and its competitiveness through superior education services at a low operational cost.

#### **4. Skill Key Success Factors**

*a) Superior Workforce Talent* - DL organizations need to attract and retain the most knowledgeable and skilled employees, including faculty, technical, administrative and other support staff, as well as the highest quality of their top management.

*b) Learner Service and Care* - Similar to customers in the commercial environment, DL organizations need to provide a high-quality learner service and care.

*c) Quality Controls* - DL organizations need to provide both short-term (course delivery, the quality of programs and courses, the reading resources, responsiveness and effectiveness of the staff, the quality of DL platforms and their delivery performance) and long-term quality controls. Achieving accreditation is an administrative challenge, but the real challenge is to ensure that their alumni upon graduation demonstrate a consistent sequence of achievements, professionalism and success in industry (e.g. MIT, Stanford University, etc.).

*d) Design Expertise* - DL programs should be designed by the experts in the relevant fields, and based on the state-of-the-art literature and other references. Especially in rapidly changing high-technology fields, programs and courses should be updated and redesigned accordingly.

#### **5. Financial Success Factors**

As DL markets are rapidly growing, organizations face financing challenges such as: a) Manageable debt levels; b) Access to financial capital. To sustain competitive pressures, a DL organization needs to leverage on its core competencies, form strategic alliances with partners who can ensure financing, as well as maximize its economies of scale.

### **CONCLUSION**

This paper presents an overview of challenges and success factors for DL organizations focusing on graduate programs for IT professionals. As the market is rapidly growing, the competition is growing as well while each organization is trying to maximize the leverage of its resources and core competencies. Information technologies and highly competent people are the key to the success for any DL organization.

### **REFERENCES**

1. The White House Social Statistics Briefing Room (<http://www.whitehouse.gov/fsbr/education.html>)
2. National Science Foundation (NSF) - Science and Engineering Doctorate Awards - Detailed Statistics - <http://www.nsf.gov/sbe/srs/nsf03300/secta.htm>
3. NSF - Doctorates Awarded, by Field of Study and Year of Doctorate: 1992-2001, <http://www.nsf.gov/sbe/srs/nsf03300/pdf/tab1.pdf>
4. NSF - Percentage Distribution of Science and Engineering Doctorates Awarded, by Major Field and Citizenship Status of Recipients: <http://www.nsf.gov/sbe/srs/nsf03300/pdf/tab4.pdf>
5. NSF - Percentage Distribution of Definite Postgraduation Plans of Doctorate Recipients, <http://www.nsf.gov/sbe/srs/nsf03300/pdf/tab10.pdf>
6. CHEST - VLE / MLE Comparison Grid, <http://www.chest.ac.uk/datasets/vle/checklist.html>
7. S. M. Johnstone, "Emerging Trends & Implications for Quality Assurance", International Council for Open and Distance Education, SCOP Meeting, São Paulo, Brazil, 2000, <http://www.wcet.info/resources/StaffPresentations/ICDE2000/tsld005.htm>