Encyclopedia of Information Communication Technology

Antonio Cartelli
University of Cassino, Italy

Marco Palma
University of Cassino, Italy

Volume I
A–Im

Information Science REFERENCE

INFORMATION SCIENCE REFERENCE
Hershey · New York

Director of Editorial Content: Kristin Klinger
Managing Development Editor: Kristin M. Roth
Assistant Managing Development Editor: Jessica Thompson
Assistant Development Editor: Deborah Yahnke
Senior Managing Editor: Jennifer Neidig
Managing Editor: Jamie Snavely
Assistant Managing Editor: Carole Coulson
Copy Editor: April Schmidt and Erin Meyer
Typesetter: Jennifer Neidig
Cover Design: Lisa Tosheff
Printed at: Yurchak Printing Inc.

Published in the United States of America by
Information Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue, Suite 200
Hershey PA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@igi-global.com
Web site: http://www.igi-global.com/reference

and in the United Kingdom by
Information Science Reference (an imprint of IGI Global)
3 Henrietta Street
Covent Garden
London WC2E 8LU
Tel: 44 20 7240 0856
Fax: 44 20 7379 0609
Web site: http://www.eurospanbookstore.com

Library of Congress Cataloging-in-Publication Data

Encyclopedia of information communication technology / Antonio Cartelli and Marco Palma, Editors.
p. cm.
Summary: "This book is a comprehensive resource describing the influence of information communication technology in scientific knowledge construction and spreading, with emphasis on the roles of product technologies, process technologies, and context technologies"--Provided by publisher.
ISBN-13: 978-1-59904-845-1 (hardcover)
ISBN-13: 978-1-59904-846-8 (e-book)
1. Telecommunication--Encyclopedias. I. Cartelli, Antonio, 1954- II. Palma, Marco.
TK5102.E644 2008
004.6'5--dc22
2007043957

British Cataloguing in Publication Data
A Cataloguing in Publication record for this book is available from the British Library.

An Academic Guidance Model to Orient Distance Students

Luca Vanin*
University of Milan – Bicocca, Italy

Stefano Castelli
University of Milan – Bicocca, Italy

Alessandro Pepe
University of Milan – Bicocca, Italy

Loredana Addimando
University of Milan – Bicocca, Italy

INTRODUCTION

In the last 20 years, the increasing importance of information and communication technology (ICT) induced many educational and training institutions to apply new technologies to education, in order to reach new and more ambitious goals (Hodgson, 2002; McNaught, 2003).

Academic institutions are following this same direction too. In Italy, as well as in the rest of Europe, we are witnessing the development of many experiences in *Web-enhanced learning* (traditional classes are taught, but there are online resources to complete the personal study), *blended learning* (teachers integrate traditional lessons with *e-activities*, such as online discussion groups, video conferencing and online resources) and, even if it is not so widely spread yet, *pure e-learning*, in which all the teaching process is Web based.

This chapter begins with an analysis of a distance degree in psychological sciences. The structure of the course includes a national centre, faculties of different universities, and technological centres. The technological centres, located both in Italy and abroad, are facilities available to students, and are equipped with all the technology necessary to follow the distance courses (personal computers, satellite connections, internet connections, etc.). These locations constitute actual meeting points for students, teachers and tutors, thus allowing for face-to-face exams and seminars, as well for videoconferencing. The student is guided by a new figure, the *e-tutor*, who facilitates online learning and communication processes.

The approaches to teaching and learning are both synchronic (by chat and videoconferencing) and diachronic (video lessons, practical exercises on the Internet, discussion forums, blogs, newsletters, etc.).

In order to understand the role played by technologies in a distance degree, starting from the very first steps taken by a student in the academic system, we will begin with the description of a guidance model conceived to inform, prepare and support the student during her or his academic career (Gresh & Mrozowski, 2000; Luck, 2000; McNaught, 2003; O'Donoghue, Singh, & Green, 2004). Then we present some theoretical, empirical and methodological issues about the use of new technologies in distance education. We conclude that a specific preliminary informative orientation system can prove to be a good tool to prevent e-dropouts, but on the condition that it starts from the very beginning of their academic career (Bozarth, Chapman, & LaMonica, 2004; DeRouin, Fritzsche, & Salas, 2004; Jones & Laffey, 2002; Lynch, 2001).

A three-step model is presented. The first step is "orienting", where a general exploratory guidance is given, describing the set of educational and technological instruments. In the second step, "preparing", the main goal is to reduce the technical gap between the student and the educational setting. Finally, the third step is aimed at giving technical, educational, and relational support to the student all along his/her academic career.

THE ORGANIZATIONAL PERSPECTIVE: THE STUDENT AND THE EDUCATIVE INSTITUTION

Everyday, researchers in the field of education witness the increasing use of technology in learning, and the spread of computer mediated communication in knowledge management (Jones & Laffey, 2002; Pan & Scarbrough, 1999). Very often a "naïve" use of technology is not appropriate, since it does not integrate three important elements: the student's profile, the educational system, and the organization.

The first element is a very important one for our purposes. We need to know many important data about the student (or about the individual within the organization); in a previous paper we called this concept the *extended training profile* (Vanin, 2006).

The extended training profile includes the following information:

- General personal data (age, gender, place of birth, etc.)
- Educational and training profile (school, professional and academic degrees, master courses and specializations, etc.)
- Technical profile (ability of using technical instruments and informatics skills)
- Interactive profile (habits in accessing technical equipments, in using the Internet, e-mails, discussion forum, chat, etc.).

With the concept of extended training profile, we suggested (Vanin, Castelli, Brambilla, in press) to increase the amount of information collected about students. Usually, this kind of information is collected only to answer bureaucratic and administrative requests; we suggest using it for didactical and training purposes too.

On the other side, the educational system depends from the educational institution and its organization (O'Donoghue, Singh, & Dorward, 2001). Pan and Scarbrough (1999), using a sociotechnical approach, give specific theoretical and methodological attention to the matching between social and technical subsystems. The authors outline three layers of interaction between individuals and organizations, taking into account the form of knowledge, the organizational context and structure, and the role of technology involved in the educational or organizational process (Pan & Scarbrough, 1999, p. 362). According to these authors, the three main components of a knowledge system are:

1. **Infrastructure:** It is the "strong" element of the organization, composed by the hardware and software of the communication, the net of physical and communicational contacts between members. Pan and Scarbrough (1999, p. 366) define this structure the knowledge architecture, made up by human resources, organizational entities, documents, books, as well as the physical structure of offices and databases.
2. **Infostructure:** This level includes all the formal rules which govern the exchange of information between the actors of the organization and produce a specific code, used by the actors to understand, exchange ideas and give sense to cultural metaphors and common language. Pan and Scarbrough (1999, p. 367) stress the point that these rules can be both formal and informal and govern both the use and the access to information sharing ("who" can use "what" information). An example of an infostructural element is the (material, symbolic or virtual) path that information has to travel through in order to reach its destination.
3. **Infoculture:** This third level refers to the culturally based code that organizations have developed to fit in their specific social and cultural environment. These practices, rules, values and habits define the information sharing process and represent the meaning and the role played by information in the educational and organizational structure.

Jones and Laffey (2002) elaborate over this model and apply the same framework to educational organizations with massive use of e-learning systems, evaluating the opportunity of using e-collaboration or e-learning systems in order to share knowledge. In their study, these authors give specific attention to each single part of the model: for what regards infrastructure, they point out the importance of clearly perceived values and benefits of e-collaboration, especially to substitute old tools, the role of training, of expectations and attitudes, the need to experiment new tools and to create user-oriented and user-friendly systems (Jones & Laffey, 2002, p. 254). Regarding infostructure, attention must be directed to knowledge repositories and databases to simplify the information sharing process. For what concerns infoculture, designers have to work on leadership, on

collaborative/cooperative organizational culture, on involvement and motivation (Jones & Laffey, 2002, p. 255).

In both these two models (extended training profile and Jones' and Laffey's model), the role of information in educational and organizational systems is very important, as is the complete integration of infrastructure, infostructure and infoculture to facilitate the exchange of information (Chou, 2003; Jones & Laffey, 2002; Moshinskie, 2002; O'Donoghue et al., 2001).

As mentioned before, the first component of our educational system is *infrastructure*, which includes 44 tutors (specialized in specific learning subjects), supported by administrative front- and back-offices (3 tutors working on orienting and supporting, and one didactical manager that coordinates the whole staff).

For what concerns the *infostructure*, all the administrative and didactical information are managed through the Web: Web sites, blog, F.A.Q. (frequently asked questions) are used to give static information (i.e., regulations, organizational information, etc.); discussion forums are the main technical instruments used to exchange the information in a dynamic way (both by asynchronous and synchronous methods).

Finally, *infoculture* is the most important part of an educational system. In our case study, we can define three main components of the educational organization:

1. **Completeness:** All information and organizational data (teaching programs, examination dates, informative and learning objects, etc.) must be complete, simple, unequivocal and unmistakable, with no repetition in different places (i.e., one information in one place);
2. **Students' autonomy is required:** The educational organization has the priority to develop a simple and complete information system, but it requires from students an ability in autonomously finding information, browsing the discussion forum, Websites, etc.
3. **Continuous support:** This policy can be enacted only by developing a student-centered education system, with the priority to orient, prepare and to continuously support all the informative and learning activities. This system must be also continuously monitored and constantly fed.

MAIN FOCUS AND FUTURE TRENDS

A

Orienting, Preparing and Supporting: A Model for an Online Informative Guidance

In any educational system informative guidance and preliminary orientation seems to be the first step to introduce students (or, more generally, individuals) in the educational process. In distance education this aim can be achieved by Web based tools.

In order to develop distance guidance tools and to integrate them with the organizational system (infrastructure, infostructure and infoculture), designers can follow three progressive steps: orienting, preparing and supporting (Figure 1).

The first phase is *orienting*, and refers to the capability of the informative system to meet informational demands of students. This information enable students to start building their own general view of the educational system (i.e., the characteristics of the course) and exploring the main components of the didactical system (Gresh & Mrozowski, 2000; Luck, 2000; Lynch, 2001; Scagnoli, 2002).

Contrary to what happens in a traditional University setting, in an university distance degree the focus is centered on overcoming the gap between organizational and didactical aspects (Web-based course characteristics, differences from traditional courses, main learning tools) and students' characteristics (requirements for admission, self-regulation, self-management, and availability to interact with other students). The main aim of this orienting phase is to provide good quality information for both students and the organization, stating "*what does the university ask to students*" (in terms of basic requirements, values, general and specifics rules), "*what opportunities are offered to students*" (in terms of professional development programs, post-graduate programs, career opportunities) and "*how the whole system works*" (in terms of interactions with the other main actors) in an explicit way. This latter category of information concerns the whole organization and all the variables connected with infrastructure and infostructure: information services, front office, library service, lecturers, teachers, tutors, didactic staff. This huge amount of information is completely manageable through Web-based tools. Instructions should be written to avoid physical presence, should be unambiguous,

Figure 1. Integration between educational systems and informative guidance.

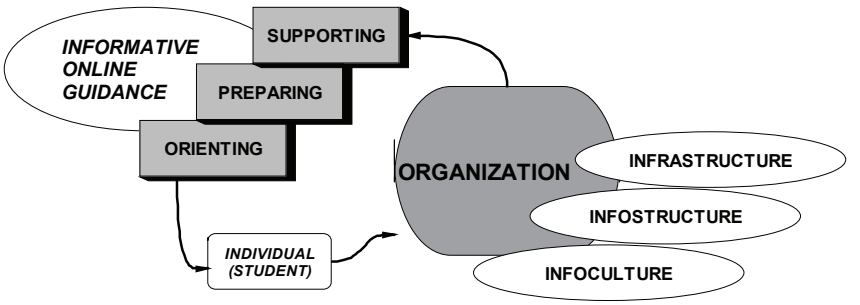


Table 1. Percentages of questions re-worked

Academic year	total n. of questions	questions re-worked	% questions re-worked
2003/2004	347	108	31
2004/2005	350	73	21
2005/2006	535	83	16
2006/2007	387	12	3

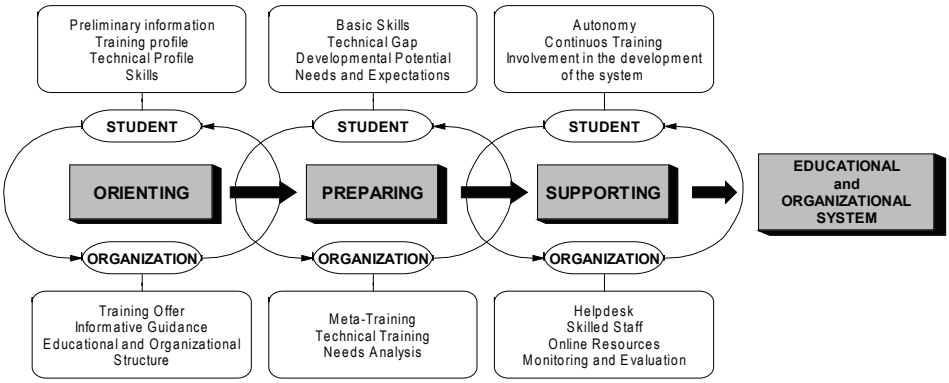
clear, pragmatic and, from an ergonomic perspective, fully accessible and usable (Chou, 2003).

Of course, clarity and usability of orienting tools emerge from a long process of refinement, and are not the result of a single intervention. Arranged according the academic year, in Table 1 the number of questions arrived via e-mail at our front desk are shown, together with the number of questions which needed other e-mails to be completely answered (often, more than one email was needed). The percentage of e-mails which call for other e-mails is an obvious indication of low efficiency of the system, and Table 1 shows a continuous trend of improvement, rather than a single resolutive intervention.

The second phase (*preparing*) addresses students' needs concerning informative, didactic, and technological skills. Students often need to be trained to bridge the gap between the educational organization's demands and their skills (Bozarth et al., 2004; Hoffman, 2002; Jones & Laffey, 2002; Piskurich, 2003). Castelli, Vanin, and Brambilla (in press) define this training as a meta-training, and stress how often this part is neglected in e-learning, even though it could be a main cause of e-dropouts (O'Donoghue et al., 2004). Moreover, the orienting phase offers implicit indications (a sort of ethological imprinting) on self-management skills required to students, about the importance of interactions with peers and about basic skills concerning learning tools (Castelli et al., in press; Vanin, 2006); in the second phase, this imprinting becomes explicit and the *preparing* phase turns out to be a formal stage, a sort of buffer in which students gain operative knowledge of basic educational and technological tools (DeRouin et al., 2004; Gervedink Nijhuis & Collis, 2005; Luck, 2000; Moshinskie, 2002; Piskurich, 2003). The main goal of this phase is to reduce resistance to technology (Frazee, 2002; Frieden, 1999) through the improvement of technological skills for learners, in order to facilitate the process of sharing experiences and building knowledge through the transformation of experiences in understanding.

The last phase, *supporting,* includes activities aimed to offer motivational, relational and technical assistance to students during the whole academic year

Figure 2. Informative guidance as an integrated system



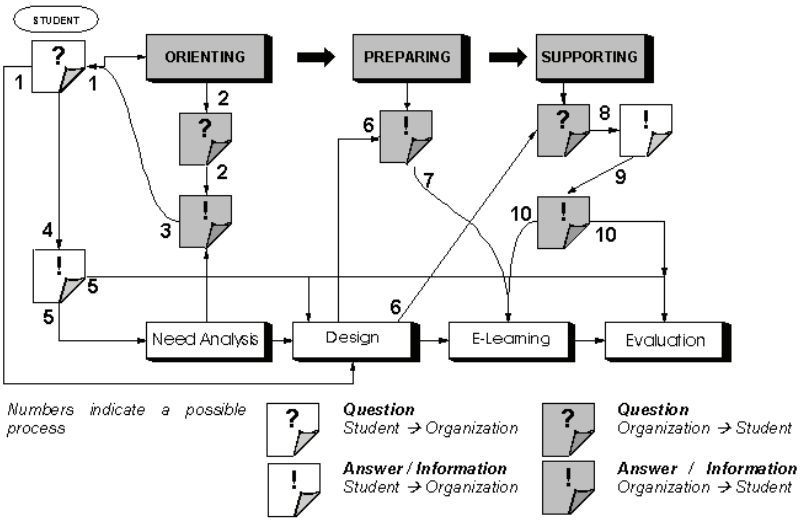
(Bozarth et al., 2004; DeRouin et al., 2004; Edwards & Fintan, 2001; Gao, Baylor, & Shen, 2005; Lee, 2001; Lynch, 2001). Web-based courses can exactly match students' needs in order to create conditions for an optimal learning experience.

As shown in Figure 2, the development of this kind of informative guidance model can encourage the entrance in the educational system, leveling off all initial differences (i.e., technical gaps between educational system and individual's profile), thus creating a common background to reduce the risk of e-dropouts (Booker & Rebman, 2005; O'Donoghue et al., 2004).

A consequence of this perspective is that selection procedures (when and if provided) and criteria should include all described aspects, in order to reduce possible "wrong expectations" (Vanin et al., in press). In our case study, for instance, we applied the extended training profile to explore needs and to detect problematic areas (i.e., gaps between students' profiles and the requests of the educational organization) in order to schedule extra training for beginners and/or to re-engineer our educational tools. A questionnaire is routinely administered to *all* would-be students who ask for information about our course before taking the admission test. Comparing this population of "potential" students of year 2006-2007 with the population of students already enrolled, we discovered only very small differences for what regards *general personal data*: most of them were female (66.0%; N=507), as it happens in "actual" students' population (56.7%; N=157). The age was between 18 and 65 years old (N=560; Mean=32.4; S.D.=8.73) in potential students and between 18 and 53 years old (N=157; Mean=35.2; S.D.=6.9) in students already enrolled. *Educational and training profile* showed that potential students (N=660) have mainly technical secondary degrees (59.4%), or a diploma in classical or scientific studies (29.6%). But the interesting thing was that only about 10% of them had some idea of what actually is "distance education". This entailed a deep revision of our guidance system, in order to correctly inform perspective students about the characteristics of this kind of learning technology. The *technical profile* was not very different between would-be students and actual students (the only real differences were the percentages of people owning a broadband connection and using Webcams, higher among actual students than in the potential students' population: but this could be an obvious effect of being enrolled to a distance course). The last part, the *interactive profile*, which refers to the informatics skills as well to the online interaction habits, proved to be very interesting: our students and perspective students rarely use the chat (57% never used, 36% sometimes). This means that we should avoid/reduce this kind of communication and/or start a technical training on this subject.

A second consequence is that the instructional developer should be aware of all the evidence thus collected, in order to enact strategies aimed to prevent and reduce students' drop out rates, which tend to be rather high in distance learning, especially in the case of students not linked to the educational network (Lynch 2001; Moshinskie 2002; Kotsiantis, Pierrakeas, & Pintelas, 2003). As shown in literature (Booker & Rebman, 2005; O'Donoghue et al., 2004), the "feeling of isolation" experienced by students and the sensation of no direct

Figure 3. The role of information in the informative guidance model



contact with groups of experts and other students may deeply affect learners' motivation, especially at the beginning of the educational process, when learners are not well inserted in the students' community.

Third, online informative guidance has a key position in all phases: as shown in figure 3 the "informative guidance system" is conceptualized as a dynamic interaction between information requested and information offered, in an integrated net that encompasses all the educational process.

This means that information is firstly offered by the educational organization (*orienting*: organization → student [section 1-5]), then information is reconstructed as an "answering system" aimed at reducing the gap between organizational demands and students' skills (*preparing*: organization →← student [section 6-7]), lastly, information becomes a specific answer to students' questions (*supporting*: student ← organization [section 8-10]).

Each phase is deeply connected with all the others by a structure of feedback, in which the whole educational organization offers guidance using both explicit and implicit students' requests (Vanin, 2006).

The primary objective of this structure is to offer information, but a key aspect of the model is that the university (or, more in general, the educational organization) should *at the same time* collect information to gain a better understanding of its audience, in terms of students' identities, knowledge production systems (intended as psychological and social artifacts) and active construction of meaning.

The proposed system collects information from each student, but it needs an accurate analysis of the educational structure (as a result of the integration of infrastructure, infostructure, and infoculture) in order to activate a developmental process that may (and should) try to reach all actors involved in the educational system.

CONCLUSION

This chapter examines a critical phase in distance educational processes and, more in general, in all organizational processes of knowledge building: newbies' entry into the system. Students can encounter many obstacles to integrate themselves within the distance training processes, so the whole system has to be customized to students' different needs.

A first set of problems is linked with the technical gap: educational and knowledge tools may represent an obstacle for many users (Spitzer, 2002), and organizations should not forget how this mismatch affects students' careers. Every kind of e-learning intervention should take into account the main infrastructural, infostructural and infocultural elements that could obstacle

learning and teaching processes. A successful learning process start with an analysis of these elements, in order to dissolve technological, educational, structural and organizational barriers. The process of training involves in-depth analyses of needs, and course design should include a socio-psycho-technical study to prevent subsequent dropout (Bozarth et al., 2004; Lynch, 2001; Moshinskie, 2002; O'Donoghue et al., 2004).

A second issue concerns all informative and guidance tools conceived to welcome, to orient and to integrate newbies (or, more generally, students) within the educational and knowledge systems. We proposed a three-step guidance model, in which each phase is aimed to help individuals to manage a variety of educational, technical and interactive difficulties.

In the *orienting phase*, the educational system should create a knowledge network (i.e., Web sites, online documents, guides, and online tours) to inform would-be students about the project, the educational architecture and the main skills required. This phase represents both a first self-selection of students, and the first step of a welcoming system.

A *preparing* phase follows, in which students are put in condition to overcome technical and educational barriers, become acquainted with the learning tools and explore the online resources. In this phase students are helped to overcome the gap between their previous skills and the required extended training profile (technical skills, internet habits, general knowledge). This preparing phase could be implemented both by e-learning and traditional classroom training blended with online e-tivities.

Supporting is the last phase, and continues all along the educational (or knowledge management) process. It is aimed to solve all kinds of technical, organizational or educational hassles. It should not be limited to a first level of helpdesk functions, but rather requires developing guides built following a bottom-up strategy (i.e., frequently asked question), or online resources that guarantee continuous support.

Our model does not claim to be the "main solution" for e-dropouts. Indeed, instructional designers, technical developers and the educational staff must take into account many other factors (Booker & Rebman, 2005; Bozarth et al., 2004; Chin & Benne, 1985; Kotsiantis et al., 2003; Lynch, 2001; Moshinskie, 2002; Spitzer, 2002) to ameliorate learning processes, online interaction and integration along with the entire educational and knowledge system (Na Ubon & Kimble, 2002). People must be put in the condition to learn and technology has to be taken into account also as a source of significant gap (Gervedink Nijhuis & Collis, 2005; Gresh & Mrozowski, 2000; Hoffman, 2002; Jones & Laffey, 2002; Moshinskie, 2002; O'Donoghue et al., 2001; Spitzer, 2002)

However, in academic year 2006-2007, in our Distance Degree we had a dropout rate of about 24% from the first to the second year; this figure is low if compared with the general datum of our University (about 26%) but it turns out to be very good if compared with the general figure of 33% recorded among students who enroll "late" (i.e., after 20 years of age; it has to be noted that the average age of our distance students is 35.2 years). The system seems to work.

The three-step model, here described, allows students to obtain a gradual and fast insertion in the didactic system by putting particular attention on students' expectations and motivations. Indeed, in order to correctly overcome the potential difficulties, the model of informative guidance considers two principal factors: a detailed knowledge of students' identities (what we called *extended training profile*), especially for what concerns their technological tools and general skills, and the guarantee that the "informative guidance system" works as a primary "imprinting" for the development of a good e-learning path. In a retroactive perspective, the informative guidance system could also represent a good proposal to follow students along their "educational pipeline", adapting the system to their profiles, as well as asking participants to adapt themselves to the educational system (Vanin, 2006; Vanin et al., in press).

NOTES

* Luca Vanin: Conceived the main focus of the chapter, introduction and conclusions; Stefano Castelli: conceived the general plan of the chapter, and wrote the organizational background, introduction and conclusions; Loredana Addimando and Alessandro Pepe: did the bibliographic research and the in-depth organizational analysis.

REFERENCES

Booker, Q. E. & Rebman, C. M., Jr. (2005). E-student retention: Factors affecting customer loyalty for online program success. *Issues in Information Systems, 6*(1).

Bozarth, J., Chapman, D. D., & LaMonica, L. (2004). Preparing for distance learning: Designing an online student orientation course. *Journal of Educational Technology & Society, 7*(1), 87-106.

Castelli, S., Vanin, L., & Brambilla, M. (in press). Analisi dei bisogni e formazione universitaria a distanza. Il modello di orientamento "a stanze". *Tecnologie Didattiche*.

Chin, R. & Benne, K. (Eds.) (1985). *General strategies for effecting change in human systems* (4th ed.). New York: Holt, Rinehart, and Winston.

Chou, C. (2003). Interactivity and interactive functions in Web-based learning systems: A technical framework for designers. *British Journal of Educational Technology, 34*(3), 265-279.

DeRouin, R., Fritzsche, B. A., & Salas, E. (2004). Optimizing e-learning: Research-based guidelines for learner-controlled training. *Human Resource Management, 43*(2&3), 147-162.

Edwards, M. A. & Fintan, C. (2001). Supporting the collaborative learning of practical skills with computer-mediated communications technology. *Educational Technology & Society, 4*(1), 80-92.

Frazee, R.V. (2002). Technology adoption: Bringing along the latecomers. In A. Rossett (Ed.), *The astd e-learning handbook* (pp. 262-277). New York: McGraw-Hill.

Frieden, S. (1999). Support services for distance education. *Educational Technology & Society, 2*(3), 48-54.

Gao, H., Baylor, A. L., & Shen, E. (2005). Designer support for online collaboration and knowledge construction. *Educational Technology & Society, 8*(1), 69-79.

Gervedink Nijhuis, G. & Collis, B. (2005). How can academics stay in control? *British Journal of Educational Technology, 36*(6), 1035-1049.

Gresh, K. S. & Mrozowski, S. (2000, October 10-13). *Faculty/student interaction at a distance: Seeking balance.* Paper presented at the EDUCAUSE 2000, Nashville.

Hodgson, V. E. (2002). The European union and e-learning: An examination of rhetoric, theory and practice. *Journal of Computer Assisted Learning, 18*, 240-252.

Hoffman, B. (2002). Preparing e-learning professionals. In A. Rossett (Ed.), *The ASTD e-learning handbook* (pp. 39-57). New York: McGraw-Hill.

Jones, N. B. & Laffey, J. (2002). How to facilitate e-collaboration and e-learning in organizations. In A. Rossett (Ed.), *The ASTD e-learning handbook* (pp. 250-262). New York: McGraw-Hill.

Kotsiantis, S., Pierrakeas, C., & Pintelas, P. (2003). Preventing student dropout in distance learning systems using machine learning Techniques. In *Proceedings of the Web-Based Educational Systems at Seventh International Conference on Knowledge-Based Intelligent Information & Engineering Systems*, 2774

Lee, J. (2001). Instructional support for distance education and faculty motivation, commitment, satisfaction. *British Journal of Educational Technology, 32*(2), 153-160.

Luck, A. (2000). *World campus101: Orienting students to Penn State's new "Campus"*. Retrieved March 12, 2008, from http://technologysource.org/article/world_campus_101/

Lynch, M. M. (2001). *Effective student preparation for online learning*. Retrieved March 12, 2008, from http://technologysource.org/article/effective_student_preparation_for_online_learning/

McNaught, C. (2003). Supporting the global e-teacher. *International Journal of Training and Development, 7*(4), 287-302.

Moshinskie, J. (2002). How to keep e-learners from e-scaping. In A. Rossett (Ed.), *The ASTD e-learning handbook* (pp. 218-233). New York: McGraw-Hill.

Na Ubon, A. & Kimble, C. (2002). *Knowledge management in online distance education.* Paper presented at the 3rd International Conference Networked Learning, University of Sheffield, UK, March.

O'Donoghue, J., Singh, G., & Dorward, L. (2001). Virtual education in universities: A technological imperative. *British Journal of Educational Technology, 32*(5), 511-523.

O'Donoghue, J., Singh, G., & Green, C. (2004). A comparison of the advantages and disadvantages of IT based education and the implications upon students. *Interactive Educational Multimedia, 9*(November), 63-76.

Pan, S. L. & Scarbrough, H. (1999). Knowledge management in practice: An exploratory case study. *Technology Analysis & Strategic Management, 11*(3), 359-374.

Piskurich, G. M. (Ed.) (2003). *Preparing learners for e-learning*. San Francisco: Pfeiffer (John Wiley & Sons, Inc.).

Scagnoli, N. (2002, February). *Strategies for designing an orientation for online students.* Paper presented at the Illinois Online Conference for Teaching and Learning WEB CONFERENCE.

Spitzer, D. R. (2002). Don't forget the high-touch with the high-tech in distance learning. In A. Rossett (Ed.), *The ASTD e-learning handbook* (pp. 164-174). New York: McGraw-Hill.

Vanin, L. (2006). Orientamento informativo e formazione universitaria a distanza. Riflessioni teoriche, operative e metodologiche. *Psicologia dell'educazione e della formazione, 8*(2), 251-275.

Vanin, L., Castelli, S., & Brambilla, M. (in press). Informarsi, informare, formare. Sistemi di rilevazione e di orientamento per la formazione universitaria a distanza. Il caso nettuno a Milano Bicocca. *Giornale Italiano di Psicologia dell'Orientamento*.

Vanin, L., Castelli, S., & Brambilla, M. (in press). Il profilo formativo allargato: un ruolo strategico nella formazione a distanza. In P.G. Rossi (a cura di), *Progettare e-Learning: processi, materiali, connetività, interoperabilità e strategie.* Macerata: Ed. EUM.

KEY TERMS

A

Extended Training Profile: Refer to the general personal information about students (age, gender, place of origin, etc.), educational and training profile, technical profile (capability of accessing technical instruments and informatics skills) and interactive profile (habits in using internet, e-mails, discussion forum, chat, etc.).

Infastructure: It is the "strong" element of the organization, composed by the hardware and software of the communication, the net of physical and communicational contacts between members.

Infoculture: Refers to the culturally based code that organizations have developed to fit their specific social and cultural environment.

Infostructure: Includes all the formal rules which govern the exchange of information between the actors of the organization and results in a specific code used by the actors to understand, exchange, and give sense to cultural metaphors and common language.

Online Guidance Systems: An online system allowing students or participants to e-learning process to understand what the educational process requires, which tools are used and to be informed of any kind of information about the organization, the educative model, and so forth.