

# Encyclopedia of Networked and Virtual Organizations

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# E-Portfolio and Pedagogical Change for Virtual Universities

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## INTRODUCTION

With the rapid advances in networking technologies and the commercialization of the Internet today, many organizations are actively reflecting on their organizational design and operating philosophy to transform their bricks-and-mortar entity into its clicks-and-mortar counterpart. We call such a transition effort the electronic transformation of the organization, or simply the e-Transformation effort (Henderson & Venkatraman, 1993; Hoque, 2000). Obviously, such an effort requires an objective methodology (Vat, 2000b; 2002b), which must be instrumental to creating an efficient electronic organization (e-Organization) model that could enable the organization (Vat, 2001a; 2002c) to launch and learn based on some innovative initiative, and then incorporate the lessons learned and launch again. Consequently, organizational transformation could be considered as the essence of a learning organization (Senge, 1990; Garvin, 1993; Vat, 2001b), implying its constant efforts to better itself for any coming challenges. An example of such transformation is to consider the challenge of managing a learning university (Duke, 2002) and putting the university online (Cornford & Pollock, 2003). A university comprises valuable assets coming from its teams of knowledge workers, who have a strong formal education, have learned how to learn, and have a habit of continuing to learn throughout their lifetime. Nevertheless, human capitals as an organization's intellectual assets could be made more visible only through their application and reuse (Conklin, 1996; Stewart, 1997). These then are good reasons to stewarding people's intellectual knowledge, however implicit it may be, and making it available within and without the organization whose competitive edge comes from having and effectively using such knowledge. The idea of electronic portfolio systems (e-Portfolio) (Aalderink & Veugelers, 2006; Dalziel, Challan, & Sutherland, 2006), as part of a university initiative to improve teaching and learning, fits timely to advance this goal in higher education. However, this vision requires e-Transforma-

tion efforts on the part of the conventional university, to take advantage of not only the new technological, but also the renewed pedagogical opportunities. The result could eventually be an essential constituent of a virtual university (VU) (Hamalainen, Whinston, & Vishik, 1996; Chellappa, Barua, & Whinston, 1997; Vat, 2001a; 2004), which is an electronic form of the original university renewed based on the working model of a virtual organization (Davidow, & Malone, 1992; Cheng, 1996; Hedberg, Dahlgren, Hansson, & Olve, 1997), to enable a re-engineered vision of the university's education process.

## THE BACKGROUND OF SOME VU'S INITIATIVES ON E-PORTFOLIO

Typically, universities customarily generate content locally, and dispense courses only regionally to their students. The global market, nevertheless, offers the possibility for content import and course export (Hamalainen, Whinston, & Vishik, 1996). Importing materials from the best possible sources, say, specialists or distinguished scientists could enhance a better quality service. Exporting courses renders a good chance for universities to amortize their costs over a higher volume of students. However, the key to establish this practice of educational services lies in the trustworthiness of the materials and services rendered. In this regard, the value of a marketable e-Portfolio as reliable sources and distributors of quality educational products and services stands out unquestionably. Still, an important concern of the VU must focus on developing skills and expertise of the university in customizing educational services or content on demand rather than merely providing terminal degree programs with predetermined curricula. It is envisaged that besides an administrative body, and teams of instructors, a VU should comprise content providers, content reviewers, validation supervisors, and students-practitioners connected electronically with appropriate control mechanisms. The VU's electronic

infrastructure (Chellappa, Barua, & Whinston, 1997; Vat, 2000a; 2002a) must be equipped with, among others to be innovated, a repository of reusable educational components in course development, a document filtering system, an electronic team-based review-and-edit system and a user-centered digital learning environment. Operationally, a VU could select educational materials from various content providers and from educators on demand to the extent that their respective e-Portfolios could satisfy the necessary requirements, customizing them to student needs and interests, thereby providing the benefit of learning customized knowledge and skills minus the opportunity cost of time and other resources incurred by students. The critical problem is to set up the proper organization within the university. More importantly, universities nonetheless require insight to decide the areas for which they will be global content providers, based on the judgment that there is a promising demand for that service.

## **THE VU'S CONTEXTUAL FOCUS OF KNOWLEDGE SHARING**

Organization transformation in the direction of a virtual learning university to provide customized educational services worldwide for lifelong learners, is indeed a continuous process of creating, acquiring, and transferring knowledge (be it individual or organizational), which is often accompanied by a necessary modification of individual and organizational behaviors, to reflect the new knowledge and insight produced. Such a process itself if managed appropriately could mean an important asset for the organization to be included in her e-Portfolio publishable over the Internet around the globe (Hakel, Gromko, & Blackburn, 2006). Today the view that knowledge (human brainpower) is a valuable organizational resource has fueled interest in researching into the various activities of knowledge sharing. The key lies in collaboration (Vat, 2005), which attempts to address the issues of capitalizing on individual know-how in a collective knowledge so that others do not have to relearn what the enterprise already knows, leading to the improvement of organizational work processes and productivity (O'Leary, 1998).

## **An e-Portfolio Model of Knowledge Creation**

Internally, the VU must have a number of objectives (Vat, 2000a) set in operational terms of knowledge sharing. First, we have to ensure an effective and efficient development of new knowledge and improvement of existing knowledge, throughout the organization. Second, we need to ensure a specific distribution of new knowledge to other departments and to new employees through knowledge transfer or relocation of knowledge bearers. Third, we must ensure an effective securing of knowledge, which is also made accessible to the whole organization. Fourth, we must ensure the effective and efficient combination of the best knowledge available within an organization or network of organizations. Overall, we need a process model for implementing knowledge sharing. In fact, we must be aware of the cyclic nature of this model (Spek & De Hoog, 1995; Spek & Spijkervet, 1997), composed roughly of such iterative activities as review, conceptualize, reflect, and act. 'Review' means checking what has been achieved in the past, and what the current state of affairs is. 'Conceptualize' is trying to get a view on the state of the knowledge in the organization, and analyzing the strong and weak points of the knowledge household (an organization relying on its knowledge flow to survive). 'Reflect' is directed toward improvements: selecting the optimal plans for correcting bottlenecks and analyzing them for risks that accompany their implementation. 'Act' is the actual effectuation of the plans chosen. Obviously, the analysis, plans and actions are usually formulated to aim at an integration of strategy formation and executive tasks where learning about the application and development of targeted knowledge assumes a central role within the organization.

## **An e-Portfolio Scenario of Knowledge Work**

One of the university's learning experiences is to enable knowledge development and transfer among teachers and students in an interactive and collaborative atmosphere (Vat, 2002b; 2004). Actually, in the context of a VU, there are different stakeholders behind this simple statement of purpose. Firstly, there

are knowledge providers, representing the specialists or experts in whom the knowledge of a certain area resides. Secondly, there are knowledge users who need to use the knowledge to carry out their work successfully. There is also the need for knowledge watchers who gather, filter, analyze, and distribute knowledge elements from the outside world. It is also essential not to forget a team of validating experts, who validate the knowledge elements before their insertion into the course materials. In inquiry-based learning, students as knowledge users are often encouraged to actively participate in generating, accessing, and organizing the required information. They construct knowledge by formulating their ideas into words and then develop these ideas as they react to other students' or teachers' responses to their formulations. Knowledge construction can then be considered as the process of progressive problem investigation, which stimulates students to be innovative, create intellectual property, and develop and acquire expertise. Meanwhile, in order to enable students to better select and manage their studies, it is important that the VU considers the component-based development of individual educational programs. Basically, each program could be re-structured as webs of logically coherent courses, which are in turn organized as series of logically complete modules that are designed as serial sets of sessions to enable renewal and reuse of teaching materials. Hence, each program and all its components can be flexibly configured such that programs can change their courses; courses can change their modules; and modules can change their sessions. The new model requires that educational programs should be organized as sets of interrelated modules for pedagogic reasons. Subsequently, modules can be used within different courses and courses within different programs. To achieve these knowledge tasks, academic staffs need considerable skill and knowledge to deal with the acquisition, creation, packaging, and application of emergent and established knowledge. This is about leveraging the expertise of people and making the most effective use of the intellectual capital of the VU. Understandably, it is important to have good coordination, evaluation and evolution of the instructional units. And these activities require some meticulous preparation in personnel and the management structure, and they should occupy an important part of the university's e-Portfolio.

## **A VU Philosophy of Change Management through e-Portfolio**

The notion of virtual organization, according to Mowshowitz (1997), could be considered as a set of principles for managing goal-oriented activity based on a categorical split between task requirements and their satisfaction. In this formulation, the virtual organization model makes explicit the need for dedicated management activities that explore and track the abstract requirements needed to realize some objective while simultaneously, but independently, investigating and specifying the concrete means for satisfying the abstract requirements. It can be expressed as a framework for accommodating dynamic changes in both requirements and available services in an organizational and technological setting, in which the means for reaching a goal are continually and routinely evaluated in relation to explicit criteria. That way, management could ensure that requirements are satisfied as appropriately as possible. It is convinced that this philosophy could be applied to the setting of a VU when we adopt new technologies, processes, and methods, in the case of developing the e-Portfolio system of creating and delivering educational services. This is also the idea of technology change management. A useful example is the IDEAL model (Gremba & Myers, 1997), originally conceived as a life cycle model for software process improvement based on the capability maturity model (CMM) for software at the CMU-SEI (Paulk, Weber, Curtis, & Chrissis, 1994), and has later been revised for broader applications. IDEAL now provides a usable, understandable approach to continuous improvement by outlining the steps necessary to establish a successful improvement program. Following the phases, activities, and principles of this model has proven beneficial in many improvement efforts. The model consists of five stages. Initiating (I) is to lay the groundwork for a successful improvement effort. Diagnosing (D) is to determine where we are relative to where we want to be. Establishing (E) is to plan the specifics of how we will reach our destination. Acting (A) is to do the work according to the plan. Learning (L) is to learn from the experience and improve our ability to adopt new technologies in the immediate future.



## **AN E-PORTFOLIO VIEW OF VU'S FUTURE DEVELOPMENT**

The turbulence generated by the integration of information technology into higher education has provoked much wishful thinking, among educational planners, faculty members, and university administrators, regarding the promising VU projects, such as Web-based course and content management, groupware for faculty and students collaboration, and cooperative environments for teaching, research, learning and administration support. Unavoidably, it will be necessary for academics to adjust their teaching practices, and for administrators to re-examine the philosophy of running a university in this Internet era. Yet, if collaboration really matters, any VU learning experience should not be an erratic response to mere technical advances (Vat, 2001b; 2002a), but rather it must be a genuine attempt to achieve specific educational goals (knowledge development and transfer). According to Johnson and Johnson (1989), if a VU is to succeed in the emerging marketplace of the educational industry, we need to be mindful of nurturing some basic conditions throughout the process of providing educational services to our student-clients.

### **The VU's Renewed Mindset for an E-Portfolio-Based Education**

In contrast to the traditional 'direct transfer' model in which the instructor is assumed to be the sole source of knowledge and skills, the VU's learning model based on e-Portfolio (Tosh, Werdmuller, Chen, et al., 2006) could be an interactive, collaborative knowledge building process (Harasim, 1990; 1999). In the linear model of education, learning design proceeded in a linear fashion from defining objectives to lesson planning to course delivery. Associated with this linear approach was a set of teaching strategies, which are characterized by being predominantly one-way, centralized, and broadcast-oriented. When students appeared bored and unengaged in this type of program, the solution was to find ways to use new media to make the one-way broadcast more entertaining. Today, we need a renewed mindset for education. Teaching and learning must be seen as an ongoing process rather than a program with a fixed starting and ending point and the importance of widespread participation by learners in the design of their own learning must also be properly recognized

(Kimball, 1995). information and communications technologies (ICT) are particularly well suited to this dynamic approach to managing education. The adoption of e-Portfolio tools in higher education must be designed to demonstrate evidence of more authentic student work, show student progress over time, and represent collections of best work. In order to support integration, synthesis, and re-use of formal and informal learning experiences, the challenge for educators is to develop new pedagogical approaches to encourage students to recognize and extend the value of e-Portfolio software beyond simple course applications. Good teachers have always been open to changing their lesson plans based on student input. New media makes it easier. And online environments can provide space for continuing conversation among students and teachers about what is working and what is not working in the course. The idea of participatory course design is also important in an e-Portfolio-based education. The VU environment should provide an opportunity to support this type of collaborative learning in ways we have not been able to do before.

### **The VU's Techno-Pedagogic Models of e-Portfolio**

As online technologies and information resources rise in salience with the advent of the Internet, we are witnessing the emergence of a multi-faceted techno-pedagogic reality in the development of the VU scenario of e-Portfolio-based education. It ranges from the simple conceptualization of e-Portfolio as a means of capturing student progress through a program of study, involving student work, student reflection, and faculty comments related to activities of teaching and learning (Henry, 2006), to the technological potential (Plater, 2006) which allows students, faculty, and institutions to actually do what heretofore they have only imagined: enable each student to have a personally managed, meaningful, coherent, integrated lifelong record of learning that demonstrates competence, transcends educational levels, and is portable across institutions of learning be it formal or informal. In fact, e-Portfolios can be more than storage devices of the learner's best work (O'Brien, 2006) when faculty develops a curriculum that integrates them across each student's academic career. Specifically, it is convinced that electronic portfolios should provide the means for students to set learning goals, monitor and regulate

their progress toward these goals, as well as develop their self-assessment skills. For lifelong learners, it is also believed that such goals should best be focused on learning objectives rather than mere performance objectives. Meanwhile, if e-Portfolios should serve as the student's pathway from classroom to career, there must be some specific suggestions on the portfolio development process with concrete suggestions on the steps to follow, the design process, and modes of distribution. There are some interesting examples rendered by Flanigan and Amirian (2006), and interested parties may also refer to the work of Walz (2006) for more details in student e-Portfolio services.

### **The VU's New Roles for Teachers and Students**

Instead of performing as the sage on the stage transmitting knowledge to a class of innocent students, in the VU's collaborative e-Portfolio-based learning environment, teachers' roles are often defined in terms of mediating learning through dialogue and collaboration where knowledge is created in the community of students rather than being transferred from the individual. More specifically, the idea of mediating could include such aspects of facilitating, modeling, and coaching (Chung, 1991). Facilitating involves creating rich activities for linking new information to prior knowledge, providing opportunities for cooperative work and collective problem-solving, and offering students a multiplicity of authentic learning tasks. Modeling serves to share with students not only the perceived content to be learned, but also the important meta-cognitive skills of higher-order thinking, in the process of communication and collaboration. Coaching involves giving hints or cues, providing feedback, redirecting students' efforts, and helping them use a strategy. A major principle of coaching is to provide help only when students need it so that students retain as much responsibility as possible for their own learning. In fact, we need to teach students to rely less on teachers as the source of knowledge. We need to help them learn to learn as self-directed groups of active, autonomous, and responsible individuals. In the VU's learning settings, students are expected to assume their new roles as collaborators and active participants. It may be useful to think how these new roles influence processes and activities before, during, and after each episode of learning. For example, before learning, students set goals and plan learning tasks.

During learning, they work to accomplish tasks and monitor their progress. After learning, they assess their performance and plan for future learning. In practice, students constantly need help from the teachers to help them fulfill such new roles. Students must learn to become teachers of their own. Indeed, a frequent formula (Dilworth, 1998) that action learning proposes has been quite useful in the context of e-Portfolio-based education, to constantly remind students of their new role in the VU's learning scenario. Namely,  $L = P + Q + R$ , where L (learning) equals P (programmed instruction) plus Q (questioning) plus R (reflection). Here P represents the knowledge coming through textbooks, lectures, case studies, computer-based instructions, and many others. This is an important source of learning but carries with it an embedded caution flag. That is, P is all based in the past. Q means continuously seeking fresh insight into what is not yet known. This Q helps avoid the pitfall of imperfectly constructed past knowledge. By going through the Q step first, we are able to determine whether the information available is relevant and adequate to our needs. It will point to areas that will require the creation of new P. R simply means rethinking, taking apart, putting together, making sense of facts, and attempting to understand the problem. Following the use of this formula, action steps are planned and carried out with constant feedback and reflection as the learning takes place. It can provide for the mature students elevated levels of discernment and understanding through the interweaving of action and reflection.

### **CONCLUSION**

It is convinced that the organizations that will truly excel in the future will be the organizations that discover how to tap people's commitment and capacity to learn at all levels in an organization. A principal virtue of the electronic portfolio in a VU is its utility as a tool for teaching and learning. It is much more than a repository or showcase for student work. The cumulative record of student performances can be easily book-marked in an e-Portfolio, with reflections (student self-assessments) and faculty assessments linked to particular passages or elements of the student's work. Likewise, to harvest the knowledge and experience of teachers and students and make it available throughout the VU as an education services provider, ICT technologies supporting

e-Portfolios need to be managed adaptively, such as a personal knowledge management tool, recording achievements, and targeting new learning requirements. In particular, the ability to connect different learning episodes and contexts at any given time is one of the main challenges ahead of the VU if we wish to reap all the benefits promised by the e-Portfolio whose implementation technologies must support a learning environment, which could stimulate and nurture the complex network of interpersonal relationships and interactions. Also, people must be allowed to make choices about whom they need to communicate and learn with without regard to traditional organizational boundaries, distance and time. In other words, with e-Portfolios, people need to manage their own learning to form new groups and teams as requirements develop and change. The new framework for managing the VU should then be about managing the learning process as well as managing course contents. The kinds of questions we need to be asking ourselves are not only about how to plug one type of technology into another, but also about how to use technology to leverage resources and group dynamics in new ways to make fundamental changes in every part of the learning process and to invent and innovate the organizational context to create new models of experiences for knowledge sharing.

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## KEY TERMS

**Education Services Provider:** An entity (or an organization) running along the business of offering education services as its marketable products.

**Electronic Organization (e-Organization) Model:** A term used to describe the way electronic transformation of organizations in today's Internet era, is conducted, so as to render various virtual experiences of organizational activities instead of the physical encounter of the same.

**Electronic Portfolio (e-Portfolio):** An electronic space to reflect upon a person's or an organization's digital identity, including relevant working experiences in terms of artifacts that relate to his or her professional career, or the organizational profiles detailing the mission, history and achievement of the enterprise. In an instructional context, the nature of e-Portfolio carries two connotations: as a means of assessing specific student performance, and as a showcase for outstanding student accomplishments.

**Electronic Transformation (e-Transformation):** The process of an organization's transformation from a bricks-and-mortar entity to its clicks-and-mortar counterpart, involving the use of various information and communications technologies to enhance the productivity of the enterprise in the Internet era.

**Knowledge Sharing:** Any people- or organization-oriented activity to share know-how in a way that makes it easier for individuals, teams, and enterprises to work together (or collaborate) in order to contribute to one another's success in today's knowledge society.

**Pedagogical Change:** The tasks involved in re-organizing the conventional model of education, say, from the 'direct transfer' model of broadcast-based teaching, to the interactive (or collaborative) model of knowledge construction. One example interpretation in the context of lifelong learning is the shift away from a teacher-centered mode of lecturing to the student-centered mode of participative learning.

**Virtual University (VU):** An electronic counterpart of the campus-based university, renewed based on the advanced networking technologies and the commercialization of the Internet, to offer educational services through such electronic medium as the World Wide Web.