

Foreword

According to Edward de Bono in his *New Thinking for the New Millennium*, the thinking of the last millennium has been concerned with ‘what is’ – the thinking of analysis, criticism and argument. We are advised to concentrate on thinking concerned with ‘what-can-be.’ This is thinking that is creative and constructive and seeks to solve problems and conflicts by designing a way forward. The emphasis is on design, not mere judgment – a theme that is worthy of our attention. On the nature of inquiry, classical science is preoccupied with independent variables. It assumes that the whole is nothing but the sum of the parts. Accordingly, to understand the behavior of a system, we need only to address the impact that each independent variable has on that system. However, increasingly we are finding out that our independent variables are no longer independent and that the neat and simple construct that served us beautifully in the past is no longer effective in real practice. As systems become more and more sophisticated, the reality of interdependency becomes more and more pronounced. Understanding interdependency requires a way of thinking different from analysis; it requires synthesis. Analytical thinking and synthetic thinking are quite distinct. The former comprises typically a three-step thought process. First, it takes apart that which it seeks to understand. Then it attempts to explain the behavior of the parts taken separately. Finally, it tries to

aggregate understanding of the parts into an explanation of the whole. Synthetic thinking uses a different process. It puts the system in the context of the larger environment of which it is a part and studies the role it plays in the larger whole. In fact, the ability to synthesize separate findings into a coherent whole and the ability to generate information from different perspectives can be considered as an important part of thinking what-can-be.

In this dissertation, as a response to the complexity of the everyday problem situations encountered as a member of an organization – an institution of higher education in Macau, in the midst of knowledge economy, and at the advent of the Internet technology, the author set out to see if different ideas from the study of organizational (institutional) transformation, knowledge (pedagogical) management, and software development, could help to find ways of understanding and coping with the perplexing difficulties of taking action, both individually and in groups, to improve the situation which is created continuously and changed continually by our daily experiences. Specifically, the dissertation explores the value of the bundle of ideas captured in the notion of the learning organization (university as a learning enterprise), which is investigated as a way to enable knowledge synthesis among a group of people working to achieve a common goal or a set of goals. This is explored

through the development of transformation scenarios in the midst of an organization's transition from the mechanistic hierarchical model to the organic learning organization model. To investigate the electronic transformation of an organization from its bricks-and-mortar entity to its clicks-and-mortar counterpart, the dissertation investigates the idea of virtual organizing the teaching and learning activities in the interest of different communities of inquiry in a university environment, providing learning organization information systems (LOIS) support to course instructors adopting the philosophy of learning-centered education (LCE) and the practice of blended learning. In particular, specific cases of Web-based course support, developed through scenario-based design, applicable to the LCE style of teaching are discussed, as an illustration of how the individual electronic services of a rich environment for active learning (REAL) space could be conceived and established at the university. In the process of investigation, the author has moved away from working with the idea of an obvious problem, which required solution, to that of working with the idea of a situation of concerns, which some people, for various reasons, may regard as 'in need of solution.' In the specific context of how to put the learning university online, the problem situation is investigated from such dimensions as the technical, the cultural and the political. Some relevant purposeful activity models are then discussed which account for the context of human activity

systems conceived as a vehicle to do organizational modeling and analysis. Also of interest is the elaboration of the changes that would improve the situation, and the accommodations between conflicting interests, which will enable actions-to-improve to be taken. New information and communication technologies (ICTs), and above all the World Wide Web, hold out many promises for higher education institutions in terms of flexibility, efficiency, quality and access. The vision is that of a learning university with enough virtualization to support its quality knowledge activities. This dissertation seeks to uncover what the pursuit of that vision, from the perspective of a learning-centered organization, means for a higher education institution, in terms of knowledge development and transfer, through the efforts of a teacher-researcher acting both as an organizational architect, and as a software engineer.