Preface

Today’s society is currently being molded by the rapid exchange of knowledge now possible. This has created a new way to examine, explore, and understand human society, now a “knowledge society,” and that new understanding will only become more vital for researchers, governments, schools and universities, and any other institution that is established to interact with and support society. The chapters contained in this summation of the inaugural volume of the International Journal of Knowledge Society Research begin the process of widening the communication between researchers actively studying social effects of technology and the government, policy makers, and any reader interested in detailed analysis of today emerging knowledge society.

In Chapter 1, “Quantum Modeling of Social Dynamics,” the authors apply models extracted from the Many-Body Quantum Mechanics to understand how knowledge production is correlated to the innovation potential of a work team. This study is grounded in key assumptions. First, complexity theory applied to social science suggests that it is of paramount importance to consider elements of non-objectivity and non-determinism in the statistical description of socio-economic phenomena. Second, a typical factor of indeterminacy in the explanation of these phenomena lead to the need to apply the instruments of quantum physics to formally describe social behaviours. In order to experiment the validity of the proposed mathematic model, the research intends to:

1. Model nodes and interactions;
2. Simulate the network behaviour starting from specific defined models;
3. Visualize the macroscopic results emerging during the analysis/simulation phases through a digital representation of the social network.

Educational games display great potential as an active form of knowledge transfer. This research field is young, but some patterns in educational game development can be recognized. In Chapter 2, “Adventure Game Learning Platform,” the authors present a new approach to educational game development that overcomes some downsides of more traditional systems. The paper provides the opportunity to create an educational adventure game by using specialized software tool as well as integrating knowledge in that specific game instance. As a result of that process, game definition is created as a form of XML document. On the other side, a web-based interpreter is used to present the adventure game to user in runtime. XML format provides us with platform independency. By use of this tool, the educator gains the ability to create an educational game without programming knowledge, and to reuse some previously created knowledge.
In Chapter 3, “A Policy Framework for Developing Knowledge Societies,” the authors explore the definition of a knowledge society and why such a society is desirable in the development of nations. First, this paper reviews the literature on knowledge societies and notes a gap in qualitative approaches which are amenable for framing development knowledge policies. The authors then describe a conceptual framework that depicts a knowledge society in terms of 13 dimensions that span infrastructure, governance, human capital and culture. This framework is validated with published proxy indicators from reputable sources such as the United Nations and the World Bank. In a field exercise, this paper determines the usability of the framework for policy discussion using Singapore, Nigeria, the United States and the United Arab Emirates as the foci of our analysis. The authors conclude by suggesting that such a qualitative framework is useful for policy-makers and other stakeholders to understand that the evolution to a knowledge society is a journey that requires benchmarks, environmental intelligence and an emphasis on the tacit structure of knowledge for sustainable advantage.

Building the knowledge culture is of increasing importance, not only because of its role in providing sound knowledge management and effective knowledge-based economic development, but also because of its support to environmental protection, intercultural harmony and human well-being.

Chapter 4, “Toward Building the Knowledge Culture: Reviews and a KC-STOPE with Six Sigma View,” provides a review of the knowledge culture and its related issues, and introduces a development framework for building this culture. The proposed framework integrates the main knowledge activities of knowledge generation, diffusion and utilization into an activated “Knowledge Circle: KC”. It uses the five-domain structure of “Strategy, Technology, Organization, People and Environment: STOPE” to map and interrelate the various issues associated with the knowledge culture. In addition, it adopts the “Six-Sigma” principles, and its continuous process of “Define, Measure, Analyze, Improve and Control: DMAIC” as an approach to the work toward building the target culture. The paper calls for building the knowledge culture, not only at an organization, or a country level, but also at the global level. It provides its KC-STOPE with Six-Sigma framework for this purpose and strongly recommends its use for future development toward building the target culture.

In Chapter 5, “Trust Building Process for Global Software Development Teams: A review from the Literature,” the components for Trust Building Process are justified and presented, with the purpose of a future assembly in further publications, leaving testing of this assembly far behind.

Due to increasing globalization tendencies in organization environment, Software Development is evolving from a single site development to multiple localization team environments. In this new scenario, team building issues must be revisited. In this paper components needed for the construction of the Trust Building Process are proposed in these new Global Software Development Teams. Based in a thoroughly state of the art analysis of trust building in organizations, this new process comes to narrow the gap between dynamics of trust building and intrinsic characteristics of global teams.

Realising the potential for web-based communication in learning and teaching is challenging for educators. In Chapter 6, “Using Social Networks in Learning and Teaching in Higher Education: An Australian Case Study,” the authors examine students’ attitudes toward active learning when using an unrestricted blog in an academic context and whether this can be used to support reflective and critical discussion, leading to knowledge construction. The authors collected data using an online survey with questions on student perceptions of the type, frequency and effectiveness of their strategy. Analysis of the data was conducted using Bloom’s revised taxonomy. The research indicates that students must have prior familiarity with this form of communication technology to construct knowledge in an academic context. The authors conclude that effective learning will only emerge if informed by the student experience and perspective.
Chapter 7, “Quality of Project Management Education and Training Programmes,” examines the factors that influence the quality of training and education on project management. The authors present the results of two questionnaire-based surveys. The goal of the first survey was to find what factors influence the quality of project management education, according to the perspective of trainers, professors, and training providers. The respondents included Chinese and European academics and professionals, such as project managers, software developers, financial managers and professors. The respondents were not only involved in project management training but also served as team members or team managers, thus ensuring a balanced overview of theoretical and practical issues. The goal of the second survey was to explore the definition “quality” to trainees and students. Although there were small differences of perspective, both trainers and trainees have the same approach toward a qualitative project management education.

The objectives of Chapter 8, “The Study of Educative Network Organizations in the City of Barcelona: The Nou Barris District,” is to develop a conceptual framework for studying the relationship between Human Resource Activities and Social Capital while underlining the importance that human resource policies play in the management of this variable in an IT environment. Over the past years, several researchers have analysed the relational dynamics that takes place inside and between organizations (concept, mediating and moderating variables, effects, etc.) considering it as a resource capable of contributing to the orientation and the strategic positioning of the organizations, and, as a last resort, to the support of the competitive advantages. Nevertheless, there are very few studies that include evidence about how the effective management of certain characteristics and properties of the network, such as the work dynamics developed or the interaction in the group may be useful for the operation of the work group itself in firms that develop its activity in high-tech sectors.

In Chapter 9, “The Teachers They Are Becoming: Multiple Literacies in Teacher Pre-Service,” the authors review all aspects of a Language Arts methods course for pre-service teachers, one which employs a multi-literacies pedagogy (The New London Group, 1996) and is taught at a laptop-based university. The course begins with a deliberate immersion into the complexities of multiple literacies, including digital literacy and critical literacy. The authors outline the course assignments, resources and instructional goals to determine how technology impacts pre-service teacher learning and intended future practice. The qualitative data sources include digital artifacts such as digital literacy stories, book talks that focus on social justice issues, and media literacy lessons. In addition, the researchers draw from cross-program data based on teacher candidate reflections and interviews. The data suggest that both the use of digital technology and a multi-literacies pedagogy can help pre-service teachers reflect on personal experiences to develop literacy teaching and learning practices that have transformative elements.

In Chapter 10, “A Different Perspective on Lecture Video-Streaming: How to Use Technology to Help Change the Traditional Lecture Model” the author proposes a paradigm shift in the way video lectures are used in education. Instead of using them to support traditional teaching methods, the author suggests replacing standard lectures with video lectures, opening a space for a more participatory and interactive form of teaching that supports students in deeper understanding. In this paper, the author reviews the literature, discusses the effectiveness of video lectures, and describes a methodology called VOLARE ("Video On Line As Replacement of old Teaching practices").

In Chapter 11, “Kolb’s Learning Styles and Approaches to Learning: The Case of Chemistry Undergraduates with Better Grades,” the authors investigate if the teaching, learning and assessment strategies conceived and implemented in a higher education chemistry course promote the development of conceptual understanding, as intended. Thus, the authors’ aim is to analyze the learning styles and the
approaches to learning of chemistry undergraduates with better grades. This study took place during the 1st semester of the school year 2009/2010. This research was carried out in a naturalistic setting, within the context of chemistry classes for 1st year science and engineering courses, at the University of Aveiro, in Portugal. The class was composed of 100 students. At the end of the semester, the 8 chemistry students with the highest grades were selected for interview. Data was collected through Kolb’s Learning Styles Inventory, through Approaches and Study Skills Inventory for Students, through non-participant observation, through the analysis of students’ participation in online forums and lab books. The overall results show that the students with better grades possess the assimilator learning style, that is usually associated to the archetypal chemist. Moreover, the students with the highest grades revealed a conception of learning emphasizing understanding. However, these students diverged both in their learning approaches and in their preferences for teaching strategies. The majority of students adopted a deep approach or a combination of a deep and a strategic approach, but half of them revealed their preference for teaching-centered strategies.

In Chapter 12, “Curriculum Design and Development for Computer Science and Similar Disciplines,” curriculum design and development for computer science and similar disciplines as a formal model is introduced and analyzed. Functions of education process as knowledge delivery and assessment are analyzed. Structural formation of curriculum design is presented using definitive, characteristic and predictive functions. The process of changes in the discipline is also described and analysed. The authors then develop an algorithm to determine the core of the discipline and functions of the core moving and merging are introduced.

Evaluation is an important measure for quality control in e-learning, which aims at improving a learning environment and adapting it to users’ needs, as well as proving values and benefits of a course to financers and participants. However, results and styles of evaluation are subject to the designers’, the evaluators’ and the participants’ individual and socio-cultural backgrounds. Chapter 13, “Evaluation of E-Learning,” examines evaluation from an infrastructure perspective and presents dimensions and parameters for the evaluation of e-learning. The authors take cognitive, epistemological, social and technical infrastructures into account.

Chapter 14, “Requirements for Successful Wikis in Collaborative Educational Scenarios,” asks what are the requirements for the Wiki engines to be used collaborative learning activities? Can any general-purpose engine be used? Or is there a niche for an educationally oriented crop of wiki engines? Do these educational wikis need to be integrated within the LMS to frame the collaborative activity within the walls of the virtual classroom, or is it preferable to have an external engine? These questions arise to every teacher who is about to plan a wiki-based collaborative learning activity. In this paper, the authors examine the use of wikis in college courses at three universities. The findings of this research are introduced and adopted as new features in two major open source wiki engines used for education: the Wiki module for Moodle 2.0 (as a Wiki engine embedded inside a LMS) and Tiki as independent full-featured Wiki CMS/Groupware engine.

Chapter 15, “An Innovative Educational Project at the University of Granada: A New Teaching-Learning Model for Adapting the Organization of Curricula to Interactive Learning,” details an important project from the University of Granada. The European Space of Higher Education (ESHE) is a new conceptual formulation of the organization of teaching at the university, largely involving the development of new training models based on the individual student’s work. In this context, the University of Granada has approved two plans of Educational Excellence to promote a culture of quality and stimulate excellence in teaching. The Area of Environmental Technology in the Department of Civil Engineering has developed
an innovative project entitled Application of new Information and Communication Technologies (ICT) to the Area of Environmental Technology teaching to create a new communication channel consisting of a Web site that benefits teacher and student (“Environmental Studies Centre”: http://cem.ugr.es). Through this interactive page, teachers can conduct supervised teaching, and students will have the tools necessary for guiding their learning process, according to their capacities and possibilities. However, the material is designed to serve as a complement to the traditional method of attended teaching.

As governments around the world move toward e-governance, a need exists to examine citizens’ willingness to adopt e-governance services. In Chapter 16, “A Model for Investigating E-Governance Adoption Using TAM and DOI,” the authors identify the success factors of e-governance adoption by teachers in Greece, using the Technology Acceptance Model, the Diffusion of Innovation model and constructs of trust, risk and personal innovativeness. Two hundred thirty primary and secondary education teachers responded to an online survey. LISREL then analyzed the data. Model estimation used the maximum likelihood approach, with the item covariance matrix as input. A SEM validation of the proposed model reveals that personal innovativeness, compatibility and relative advantage are stronger predictors of intention to use, compared to trust, and perceived risk. Findings may enhance policymakers’ capacities by presenting them with an understanding of citizens’ attitudes.

Chapter 17, “Meso Level as an Indicator of Knowledge Society Development,” studies the nature and the importance of the link between macro and micro levels of innovation management in the knowledge society of Denmark, Sweden, USA, India, Russia, and Moldova, suggesting that countries with different levels of knowledge society development have different link types between the macro and micro levels of innovation management. In particular, findings show that countries with a higher level of knowledge society development have a two-way mediation process between the micro and macro levels of innovation management while countries with lower level of knowledge society development tend towards a “one-direction” link. This paper argues that innovation management can only be fully effective through paying attention to this intersection, which is free of biases inherent in each individually. The authors conclude by introducing a “meso-level” indicator for knowledge society development and underline areas of further research in the field.

Chapter 18, “The Project Manager in the Theatre of Consciousness: A New Approach to Knowledge Creation and Communication,” focuses on knowledge management stressing an individual project manager’s point of view. First, the authors outline two knowledge management strategies as well as the notion of project manager. The authors concentrate on the project manager’s knowledge creation and communication using the so-called theatre metaphor for conscious experience. According to this metaphor, the human brain and consciousness work together like a theatre. With the help of the metaphor, the authors describe and attempt to understand important aspects of the project manager’s mental action in the above tasks.

The purpose of Chapter 19, “Developing Professional Knowledge and Confidence in Higher Education” is to determine the effectiveness of using multiple choice tests in subjects related to the administration and business management. To this end the authors used a multiple-choice test with specific questions to verify the extent of knowledge gained and the confidence and trust in the answers. The analysis made, conducted by tests given out to a group of 200 students, has been implemented in one subject related with investment analysis and has measured the level of knowledge gained and the degree of trust and security in the responses at two different times of the business administration and management course. Measurements were taken into account at different levels of difficulty in the questions asked and the time spent by students to complete the test. Results confirm that students are generally able to obtain
more knowledge along the way and get increases in the degree of trust and confidence. It is estimated that improvement in skills learned is viewed favourably by businesses and are important for job placement. Finally, the authors proceed to analyze a multi-choice test using a combination of knowledge and confidence levels.

Video stabilization is one of the most important enhancements where jittering caused by un-intentional movements is removed. Existing video stabilizer software and tools cannot differentiate between intentional and un-intentional jitters in the video and treats both equally. In Chapter 20, “An Efficient System for Video Stabilization by Differentiating between Intentional and Un-Intentional Jitters,” the authors propose an efficient and practical approach of video stabilization by differentiating between an intentional and un-intentional jitter. Their method takes jittered video as input, and differentiates between intentional and an un-intentional jitter without affecting its visual quality while producing stabilized video only if jitter is found to be un-intentional. While most previous methods produce stabilized videos with low resolution, this reduces quality. The proposed system has been evaluated on a large number of real life videos and results promise to support the implementation of the solution.

In today’s global marketplace, organizations are continually faced with the need to change their structures and processes to attain a competitive advantage. Implementation of new technology and information management systems results in inevitable changes in organizational procedures impacting on the people involved. Resistance to change may impact on this process and contribute to failure of this system. Managing change in an effective and efficient manner may negate this impact. Chapter 21, “A Change Management Framework to Support Software Project Management” compiles a set of guidelines to support change which involves the incorporation of technology in an organization. These guidelines were mapped to a model, the GIC (Guidelines Implementing Change) model comprising all identified factors. These guidelines are utilized to guide the implementation of a new system, while simultaneously evaluating the success of these set guidelines. This research is cross disciplinary, affecting the areas of organizational behaviour, software project management, and human factors.

Lastly, Chapter 22, “Financial Needs for a Competitive Business Model in the Knowledge Society” investigates the constraints for companies to innovate in order to be competitive in the knowledge society. Using a large and original data set of Catalan firms, the authors have conducted a micro econometric analysis following Henry et al.’s (1999) investment model and von Kalckreuth (2004) methodology empirically contrasting the relationship between firms’ investment spread over time and their financial structure. Results show that it exits a positive and significant relationship between firms’ investment shift and financial structure, emerging financial constraints for more innovative firms. Furthermore, these constraints are higher for micro companies and firms within the knowledge-advanced services’ industry. Finally, the authors find that advanced ICT uses by more innovative firms allow them to reduce constraints of access to sources of finance.

Miltiadis Lytras
The American College of Greece, Greece

Isabel Novo-Corti
University of A Coruña, Spain