Preface

The genesis of this project lies in the Editors leading a major national Australian project, ‘Building academic staff capacity for using e-Simulations in professional education for experience transfer’, over the period 2008-2010 funded under the Australian Learning and Teaching Council (ALTC) Competitive Grants Scheme. Certain chapters in this book reflect developments undertaken through this national project. The Editors would like to give due acknowledgement to the ALTC and the Australian Department of Education, Employment and Workplace Relations (DEEWR) in providing the opportunity to undertake this project which in turn provided the stimulus to make contact with other people actively involved in developing and using e-simulations in higher education and the workplace for educating the professions, and the training of other related occupations.

These contacts were located across Australia and other parts of the world; the interests in e-simulations covered both 2D and 3D immersive environments for education and training. Our investigations have revealed a major gap and therefore opportunity to foreground the use and value of these types of e-simulations in the interrelated fields of online, distance and flexible education. We have, however, chosen to situate e-simulation developments squarely in the domain of blended learning theorising and action, as it is currently receiving much attention in both so-called traditional on-campus institutions and more flexibly-based distance education providers. Increasingly, tertiary institutions seem to be evolving both sets of characteristics coalescing around commitments to blended aspects of both organisational worlds. Moreover, we are focusing primarily on the deployment of e-simulations in contributing to the education of the professions and by extension the training of other workplace occupations.

A striking theme in the book is how a range of disciplines across a variety of institutions conceptualise their learning designs for local blended learning environments, and have built the necessary capacities for developing and delivering their own e-simulation frameworks. The use of digital, Web-based simulations for education and training in the professions is a significant, emerging technology innovation requiring immediate attention. A convergence of new educational needs, theories of learning and role-based simulation technologies, point to the educators’ readiness for e-simulations as a serious teaching endeavour. As modern e-simulations aim at integration into blended learning environments, they promote rich experiential, constructivist learning. As such they are and will continue to rapidly gain mainstream acceptance.

This book contains a broad range of theoretical perspectives on, and practical illustrations of, the field of e-simulations for educating the professions in blended learning environments. Readers will see authors articulate various views on the nature of professions and professionalism, the nature and roles that various types of e-simulations play in contributing to developing an array of professional capabilities, and various viewpoints on how e-simulations as an integral component of blended learning envi-
ronments can be conceived, enacted, evaluated and researched. A broad range of professions and allied occupational groupings are considered through the chapters in this book covering: the Health professions (nursing, midwifery, psychology, occupational therapy, pharmacy, forensic interviewing, counselling, medicine); the Business and Law professions (business studies, project management, business Information Systems, financial planning, law, ethics); Arts professions (criminology, public relations, police studies, journalism); the Education profession; the Engineering and Science professions (environmental sciences, veterinary science, agriculture); the Social and Behavioural Science professions; and Workplace training (sales, mining fire evacuation). Moreover, a special contribution to the book is an emphasis on effective leadership and management to ensure e-simulations can be developed and sustained as a key strategy in institutions’ online teaching and learning plans. Of overriding importance though is the focus on effective learning designs of both e-simulations and the overall learning environments in which simulations are embedded. These learning designs are highly contingent on context, the student audience and an organisation’s technical capabilities. This demands that academic teachers play the defining role in shaping the designs and operation of their e-simulations in their learning environments for the benefit of their students’ learning.

Let us step back for a moment from this book and its contents and briefly chart the evolutionary course of e-simulations. For more than 50 years researchers have reported the benefits of simulations, but leaders with a long history of publishing and practice in the field, such as Dr. Jan Klabbers (General secretary of the International Simulation and Gaming Association from 1976 to 2004), Dr. Hugh Cannon (Dean of Fellows, Association for Business Simulation and Experiential Learning) and more recently innovators such as Clark Aldrich (co-founder of SimuLearn, independent consultant and practitioner working on educational simulations for professional skills training) recount that designing and researching simulations remains a problem, in part because ‘scientific’ methods rely on shared understandings, terminology and classification when dealing with simulation concepts, principles, rules, theories and models. Such understandings are struggling to keep pace with the advancing technologies and the reflexive practices of teachers. This situation will only become more problematic with the advent of networked and mobile simulations and games.

In respect to the explosion of technologies for educational purposes, while the 1990s was the decade of the ‘e’ in eLearning and other ‘e’ activities, the past decade has seen the emergence of the ‘i’ with many products made famous by Apple Pty. Ltd. - iPod, iTunes, iPhone and iPad. For digital simulations the ‘eSim’ term has persisted and has not been critiqued here. It could be suggested that the ‘e’ denoting ‘electronic’, might carry more appropriate connotations along the lines of experiential, emotional and engaging. These terms are at the heart of many of the chapters in the book.

As indicated, the field of simulations and games is represented by a diverse literature continuing to struggle with terminology, ontology, typology, and taxonomy. Narrowing the field to digital simulations, ‘e-simulations’ (Web-based, digital simulations) used in the service of education, hardly simplifies the challenge of identifying and organising their characteristics and attributes in a taxonomy. One way of describing e-simulations is through a typology that foregrounds the characteristics or traits they have in common. The book advocates a typology based on e-simulations used in blended learning designs in the service of higher education in the professions. It also advocates a design-based research (DBR) approach to progressing e-simulations agendas and programs. A DBR approach is illuminative of relations in the whole rather than just focusing on classifying the parts, is consistent with a constructivist epistemology, celebrates cases rather than categories, foregrounds themes rather than hierarchies of atomistic elements, and is synthetic and emergent rather than analytic and reductive.
When defining simulations, it is important to distinguish between *form* and *function*. To illustrate; while games often ‘simulate’ a system of relationships and events found in real or imagined settings, in the process of modelling these, games exhibit characteristics and attributes (e.g. winning) that non-game simulations may not. Clearly, many simulations do not function as games, but it is not unusual for goal-based, role-based simulations to contain attributes of games (e.g. rules, chance and feedback); in fact it can be argued that it is important to retain such characteristics. Equally importantly is the need to grapple with the territory which is defined as blended learning. We can see it simply at one level as the fusion of both physical and virtual environments in ways which contribute to quality learning experiences and outcomes, and which usually embody a mix of learning methods. As Littlejohn and Pegler (2007) suggest, blended learning is as much an old as it is a new phenomenon, but it is being strongly invigorated by the affordances of the new digital and online technologies:

*Blended is an art that has been practised by inspirational teachers for centuries. It centres on the integration of different types of resources and activities within a range of learning environments where learners can interact and build ideas. Over the past few decades, blended learning has extended learning methodologies, opening up opportunities for open and distance learning as well as challenging more traditional methods. Most recently the term ‘blend’ has been attached to e-learning, and this blending of e-learning with traditional methods is attracting the interest of many teachers in further and higher education. This contrasts with the relatively poor take-up of predominantly or exclusively e-learning methods, particularly where e-learning has been expected to offer an unproblematic cost-saving replication of traditional teaching methods. (p.1)*

Beyond its relatively simple and straightforward definition, the book aims to probe and deepen understanding of blended learning as the artfulness of the intentionality (wilfulness) of designing nuanced conceptualisations of comprehensively integrated learning environments. This sees teachers as agents working in reflexive ways, performing the art of influencing the way the learning environment functions. This perhaps represents a more mature notion than a simplistic description of blending being a fusion of online, face-to-face and other methods of learning.

In this book, we explicitly pay homage to the pioneers of educational simulation and their efforts to theorise the field of simulations and games; and to those who have conceptualised the field of blended learning illustrating it with a rich range of cases in action. Their work is cited through the book. We aim though to bring the message of the value of e-simulations into the realm of the practising teacher who wishes to make a difference to the learning of their students, and yet who may not wish to engage directly, and contribute actively to the body of relevant knowledge, or, indeed, wish to master complex technologies in creating valuable learning resources. They need to see approaches that work, which can be done within reasonable timeframes and with reasonable resources, and which fit with their educational values, beliefs and practices. They need to see evidence of an effective student learning experience. They need fundamentally to have an astute sense of the changing demands of professional practice, and the appropriate combination of means to prepare and enhance their students’ capacities as competent and ethical professionals in times of rapid and unpredictable change. Many of these potential users do not have the time to be taken away from their ongoing academic and training worlds to engage with grander forms of theorising and elaborate processes of design and development. We see progress as much in terms of the expansion of practical developments of high utility as we do in the refinement of theoretical frames of reference.
Thus, the target readership audience is framed by the book’s aim to develop the capacities for educational institutions to design, develop, implement, evaluate and research the impacts of e-simulations as an integral part of their educational strategies. Hence, the book has the following range of key audiences: academic teachers who wish to adopt value adding e-learning strategies to enhance the education of their students in professional fields and disciplines offered in a range of different contexts; instructional designers who wish to learn new methodologies for the cost-effective development of e-simulations; media producers interested in the skills and technologies involved in developing and delivering various types of role-based e-simulations; institutional leaders and managers wishing to make sound investments in learning, teaching and technologies; evaluators and researchers wishing to assess the impact on learning and teaching of e-simulations; professional bodies and industry experts wishing to see e-learning technologies applied in ways which will better prepare students for professional practice; and professional and corporate trainers wishing to use e-Simulation as a major method for the ongoing training and development of employees.

The book begins by setting the scene for the development of e-simulations for educating the professions in blended learning environments in Chapter 1. Holt, Segrave and Cybulski chart the field covering changing needs and circumstances, and relevant learning theories and definitions of e-simulations and blended learning. The chapter highlights a way of framing the alignment of design elements when designing for the e-simulation learning experience in a blended learning environment.

Chapters 2-4 in Section 1: Theorising the Nature of Design for Authentic Learning and E-Simulations, provide various theoretical underpinnings and consequent practical illustrative advice on designing digitally-supported authentic learning and e-simulation environments. Rod Sims in Chapter 2 draws on a life-time of instructional design experience and scholarship in conceiving a design model more attuned to the affordances of progressive pedagogy and digital media. The chapter presents an enhanced version of Proactive Design for Learning (PD4L) and applies it to the design of a fictitious e-simulation relating to the global financial crisis. Chapter 3 by Andrew Cram and John Hedberg extends the design challenge into three-dimensional virtual worlds for learning. The chapter also identifies a range of narrative types and supportive modifiers which can be deployed in designing virtual worlds. Underlying the chapter is social constructivism as a strong point of theorising about the design and operation of these worlds for student learning. Specifically, four representation opportunities for simulation designers are examined, namely; space, time, place and avatars Theo Bastiaens in Chapter 4 sets out another instructional design model based on cognitive learning theory and used in responding to life-long learning needs, namely: the Four-Component Instructional Design Model (4C/ID model). The model demands attention to learning tasks, supportive information, just-in-time information and part-task practice. The application of this model relates to teacher educators and their development needs in using interactive whiteboards in classroom teaching. The section exemplifies the diversity of theorising on approaches to designing authentic and e-simulation environments in the contexts of educating the professions and workforce training needs.

Two approaches in Section 1 are strongly shaped by pre-existing theories of learning, while the other is strongly grounded in extensive instructional design practice. Such approaches and models require further practical application and testing of their efficacy in various simulated environments. There is strength in their versatility of use, and yet careful thought needs to be given to the application of any instructional design model when considering the development of simulations, both virtual and as played out in physical settings, and in their design into more broadly conceived blended learning environments drawing on other pedagogies and media.
Chapters 5-16 in Section 2: E-Simulation Learning Designs in Action, present various e-simulation designs in action serving the needs of learners in a number of disciplines and professional fields. Each one provides insight into the design rationale, the use of the e-simulation in blended learning settings, and the evaluation of impacts on the student learning experience. The reader’s attention is drawn to two fundamental considerations shaping these designs in action. First is how the e-simulation is conceived to address the development of desired capabilities or competencies of the profession in question. These rationales increasingly need to take account of growing pressures on teaching and physical resources, and greater demands from a range of parties on acceptable professional standards. The second consideration is how the contribution of the e-simulation is defined in relation to other aspects of the blended learning environment. The former provides a range of e-simulation design actions from the development of well specified professional attributes (as usually defined by externally accrediting professional bodies) to those which help critique and open up new domains of professional capability in the fields in question. The latter consideration opens up various permutations and combinations of pedagogy, media and assessment incorporating e-simulations in complex, holistically conceived learning environments. The studies of designs in action illuminate the highly contingent and creative task of designing and successfully delivering e-simulations. Their resonance (relevance and value) is to be judged primarily by the reader in relation to their own commitments, challenges and contexts of use.

Chapters 5-10 cover broadly the health-case, health science and pharmacy professions. The feature of Chapter 5 by Belinda Guadagno and Martine Powell is the strong disciplinary-based research underpinning more effective forms of forensic interviewing as encapsulated in their e-simulation aimed at developing such communicative skills in the demanding and highly sensitive area relating to the potential sexual abuse of a child. Diane Phillips examines the value of an e-simulation in the preparation of midwives as used in diverse blended learning regional and rural settings. The skills developed respond to external accreditation requirements of the relevant professional body. In Chapter 7, Rogers, Miller and Firmin move the focus of nursing education into the three-dimensional environment of Second Life with their well designed and evaluated virtual emergency room simulation. The authors locate the benefits of their simulation within a broader examination of the worth of simulations and educational technologies within nursing education. Working in an institution with a strong profile in online, distance and professional education, Murdoch, Bushell and Johnson focus on the design of simulations in mental health and policing using a disciplined approach to their planning and delivery in Chapter 8. The Analysis, Design, Development, Implementation and Evaluation (ADDIE) approach to instructional design, and the constructive alignment framework and SOLO (Structure of the Observed Learning Outcome) taxonomy, were used to ensure the most cost-effective development of the e-simulations as integrated into the relevant curricula and assessment. The theme of developing low-cost multimedia simulations for dealing with difficult nurse-patient relationships and in doing so adopting a user-centred design approach is taken up by Peter Kandlbinder and Scott Brunero in Chapter 9. The authoring of this chapter represents a strong working relationship between the academic designer and the hospital-based professional practitioner. This type of partnership highlights the need for e-simulations to be well grounded in significant concerns of professional practice. Finally, in this cluster of chapters, Gregory Duncan and Ian Larson use a Pedagogy>Space>Technology framework to present their cases of differently conceived e-simulations in pharmacy and other health sciences. They articulate strong background factors and drivers shaping the need to consider different types of e-simulations both from the vantage point of pressures in educating the professions in higher education, and from the perspective of the changing and ever-increasing
expectations of the profession. Fittingly, the chapter concludes with a proposed inter-professional e-simulation learning environment for medical and pharmacy students. The possibility of inter-disciplinary teams designing inter-professional e-simulations in contributing to broader experiences in educating the professions is seen as an emerging field of great potential, and is returned to in the Afterword.

Chapters 11-14 cover the business Information System and project management, and customer and mine evacuation training domains. They fall generally in the area of business, management and Information Technology. Jacob Cybulski and Lemai Nguyen begin the discussion with Chapter 11 which looks at the highly strategic and targeted use of e-simulation in a very large, complex unit in first year business Information Systems. The development and deployment of the e-simulation was part of a major renewal of the entire subject, and one which is taught over campuses, regions and different modes of study (on- and off-campus) and to students of enormous diversity. Once again the e-simulation was underpinned by an astute and reasonable understanding of professional practice requirements at the first year level. More profoundly, the e-simulation and its deployment required the honest acknowledgement and critical dismantlement of ‘educational dogmas’ in order to achieve evaluated benefits. The authors remind us that e-simulations require a far broader and deeper critical re-examination of curricular, pedagogical and assessment concerns to achieve full student learning value. Moreover, the blends of media and technologies are more sophisticated and subtle than a simple substitution of one method or technology for another. Ian Searle and Hossein Zadeh take us into the use of e-simulation in a quite different type of blended learning environment with a predominately single on-campus learning experience. The authors methodically work through the professional competence requirements of the field of project management as related to managing business Information Systems projects. The project management methodologies of relevant professional associations are articulated as necessary background to their e-simulation. The feature though is the way in which the whole subject is taught through a simulation with its blending of resources and activities located in virtual and physical worlds. In Chapter 13, Virpi Slotte and Anne Herbert shift the focus into workplace-based learning in organisational contexts relating to retail sales training. In the e-simulation training programs developed the blend focuses on socially situated interaction in the workplace with the simulation itself. This blended approach had a deliberate and well researched instructional design. Chapter 14 by Michael Garrett and Mark McMahon takes us further into the world of both workplace learning and the benefits of learning in three-dimensional e-simulations. Their work is informed by the design of 3D e-simulations based on gaming technology and within a problem-based learning pedagogy. The simulation is based on the design of an occupational health and safety training platform, the Fires in Underground Mines Evacuation Simulator (FUMES). The environment developed and evaluated showcases the affordances of 3D technology for the type of learning required.

Chapters 15 and 16 deal with the fields of public relations (one of the media communication professions) and art education. These design cases in Chapter 16 augment the teacher education cases used as illustrative examples in chapters 3 and 4. In Chapter 15, Kristin Demetrious engages critically with the current state of public relations as a professional occupation. This critical re-engagement of the field in turn leads to a re-conceptualisation of the PR curriculum and the novel design intent of the e-simulation scenarios developed. While other design cases in action draw on generally accepted views held by both teachers and their professional associations on what constitutes good professional practice, Demetrious challenges us and her colleagues to rethink both the domains of ethical and constructive PR practice, and the requisite capabilities to excel in such domains. Such a fundamental critique and repositioning sees e-simulations blended into radically new curricula and pedagogies. Jenny Grenfell and Ian Warren
also adopt a more far-reaching conceptualisation of operating within and across virtual 3D and physical worlds in support again of inter-professional learning in art education and another area of public relations. Their work highlights the mutually beneficial immersion and active participation of teachers and students, or teachers and students as co-learners and co-producers of digital resources in such virtual worlds. This design case in action reveals a richness of learning and complexity of learning environments as to challenge us to think yet again about the blends of learning that might be imagined in shaping the future education of the professions as learning community.

Further cases relating to the sciences and other professional fields are illustrated in chapters 18 and 19, while chapter 20 focuses on general e-simulation systems development as related to medical and allied health-care professions. The final chapter 21 on design-based research cites as examples developments from psychology, journalism, law, accounting and financial planning. While section 2 highlights cases of e-simulations in depth, clearly other chapters in section 1 and 3, respectively, use further illustrative examples from other professional fields to build the overall view on the breadth and diversity of e-simulation developments.

E-simulations will continue to contribute to online learning and teaching the world over. What is at stake is the quality and scope of e-simulation developments, i.e. realising the potential of the strong alignments between simulation, as worthy pedagogy, and their electronic construction and delivery, as a worthy and substantial contribution to blended learning for educating the professions. Five chapters in Section 3: Developing Knowledge and Building Capacities for E-Simulations, are devoted to examining various aspects of developing knowledge and building capacities for e-simulations. Chapter 17 by Jacob Cybulski begins this investigation by identifying the key elements that need to be considered in delivering a successful e-simulation program for mainstreaming purposes. The elements are drawn together into a framework covering scope, experience, mechanics and deployment. These elements encompass more than the educational rationale and local requirements. The successful mainstreaming of e-simulations is an educational, technical and organisational challenge which needs a well and comprehensively conceived basis for success. One such element in achieving mainstreaming of e-simulations is to adopt a well-informed approach to their conception and story boarding, and then to their effective deployment. These matters are considered in detail in Chapter 18 by Terry Stewart, who introduces a particular authoring tool which has been developed to facilitate the development process, with extensive illustrations. The mechanics and functioning of this tool is further examined in chapter 19 by Jinks, Norton, Taylor and Stewart, with additional illustrative and showcase examples. Compellingly, this tool has been jointly developed by universities in New Zealand and Australia, and used in the United Kingdom. These cross-institutional, cross-country collaborative endeavours reveal the potential of expanding knowledge and capacity for greater and better action.

In Chapter 20, Piet Kommers maps out the components for developing a major research-driven system for e-simulations for developing soft skills in the medical and health-care professions. The scope of this research and development initiative is based on projects funded by the European Union (EU) including contributions from several countries in the region. Finally, Stephen Segrave and Mary Rice in Chapter 21 propose the case for design-based research in progressing e-simulation enhancements over time, and as evidenced by the use of this approach in one major institutional context. Design-based research can involve and meet the needs of various stakeholders by focusing on the value of e-simulations, and as embedded in various blended learning environments, and their development as a strategic agenda of action. The institutional setting presented reveals the potential for strong internal organisational partner-
ing as a basis for national inter-institutional partnering to build and share knowledge in the service of enhancing the profile of e-simulations in the world of blended learning for professional and workplace education. Stephen Segrave concludes the book in an Afterword exploring developments in e-simulations for educating the professions in blended learning settings in prospect. The best prospects will see more complex and sophisticated settings for the blended design and use of e-simulations, accompanied by more inter-disciplinary, inter-institutional and inter-regional collaborations.

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**REFERENCES**