Harold F. O'Neil, Eva L. Baker and Ray S. Perez (Eds.) (2016) *Using Games and Simulations for Teaching and Assessment: Key Issues*, **Abingdon: Routledge (ISBN 978-0415-73788-3 [Pbk], 336pp)**

The last, indeed only, book review I have written (Harland, 1986) was, by coincidence, another book on the use of simulations in teaching (Jones, 1985). That was a personal and very practical guide to writing simulations with lots of examples. To some extent so is this new book; the main difference is that whereas Jones covered the use of computers in a brief comment (pp. 64-67) the whole of O'Neil et al. is about the use of computers. As can be seen in the educational press, the application of games and simulations is still very relevant (e.g. McIntyre and Yeoman, 2015), so I found this aspect of O'Neill et al. a little disappointing. Jones characterised games and simulations as "activities in which students/pupils could be in charge of events and have an opportunity to develop life skills and the skills of language and communication" within a context "characterised by action and behaviour rather than the acquisition of facts" (pp. x-xi) and this forms the core of the approach taken by O'Neil et al.

The interests, expertise and employment areas of the authors cover not only the educational sector *per se* but also the commercial and military, providing a useful depth and range of approaches to the task of design. For example, there is really useful guidance on planning for specific users as well as consideration of factors such as what you want learners to achieve, how to assess individual learning, how many variables a learner can handle at one time and the use of language/jargon. In face-to-face teaching we handle many of these factors as we go, indeed we are using tools such as Textwall® to gather information and fine tune our teaching in practice. In the virtual world, however, all possibilities must be planned and tested in advance - the importance of pilot studies is shown, and the ethics of data capture from users explored.

Chapter One considers the design of games and simulation. Chapter Two investigates modelling user behaviours and issues of validity, which are further extended in the following chapter. Chapter Four provides an overview of ITS (intelligent tutoring systems), serious games and the Generalised Intelligent Framework for Tutoring (GIFT) and provides good evidence for effectiveness of various designs. Personally I found these four chapters the most useful, because they reinforce good design of teaching, learning and assessment experiences in general, with added emphasis on the pitfalls for distance learning. Even where used in a conventional taught course,

the essence of many computer-based simulations is that the learner is remote from academic staff support; using the activity and the importance of providing adequate help and reinforcement in mid-game is emphasised.

The next section of the book examines assessment. Chapter Five covers the use of games for social and emotional development with a case study evaluation of the use of icons and some general comments on the use of formative feedback in the design stage of development. Chapter Six provides a review and analysis of the use of ITS for one-to-one tuition and gives a useful review of other methods of instruction. Chapter Seven looks at measuring learning and is a good introduction to assessment in a more general context; it considers both the traditional 'pre-test–intervention–post-test' model and the Socratic 'experience–evaluate–experience–evaluate' model which is more reflective and allows more individualisation, discusses the purpose of assessing learning for competence versus assessing learning for certification, and provides some useful examples. Chapter Eight investigates the role of neurobiology in teaching and in assessing games, considering both commercial and educational projects and provides a useful list of design features for a successful game.

Following this, the book explores cognitive, motivational and psychometric issues. Chapter Nine looks at the importance of having a metacognitive strategy for learning research and the role of metacognition in games and simulations in particular; it has an interesting and more widely applicable section on games research. Chapter Ten considers motivation from the point of view

of the learner and provides good background on motivation which is generally applicable. Chapter 11 looks at the ways in which games can be used to enhance the readiness of low-income family students for HE, providing fun, engaging, social activity (which reminded me very much of the board game Careers® I have played with my family); the approach can be adapted for a variety of contexts. Chapter 12 provides information on both learning processes and the end product and comments that it is possible to use "in game interactions to assess elements of skills, knowledge, identity, values and epistemology" (p. 253), for example, using knowledge and skills as a gateway to the next part of the simulation (equivalent to 'unlocking a new level' in a commercial game). Chapter 13 considers the role of multilevel item response models in evaluation and, to be honest, I got rather lost in the mathematical aspects of the model; however the principle that a simple analysis may hide the true value of games is clear.

To follow the theory sections fully, you will need to understand the language of educational psychology, but the main points on planning and design are clear, well referenced and relevant to many situations. I have been inspired to re-evaluate some of my own strategies for teaching such as sequencing of material as a result of reading this book.

I think the book would benefit from some analysis of what games and simulations are *not* good for. The book does distinguish between recreational games and 'serious games' and the point is made that games usually work best for shallow learning and

simple tasks whilst ITS could optimise motivation and deep learning (deep learning involves 'work' and is therefore disliked by some students and such systems could engage students more fully).

However few academic staff would have the ability to write such programmes and would need to consult with IT experts, which is not necessarily convenient or short term and would require both financial and significant time resources for development. In such circumstances a cost-benefit analysis would need to be made. This should include an assessment of how long the material would remain relevant (as in some subject areas the field moves very quickly and materials can become irrelevant). Thus choice of topic area is important when committing significant resources to developing a game or simulation. I myself use case studies to provide real world learning opportunities for students; based around the development of a wiki by a group of students which can be easily updated year on year to reflect changes in practice. To convert these into on-line cases with sequential release of material would be possible and, though challenging, could be adapted.

Overall whilst many of the ideas may not suit everyone or every situation, this should not detract from a thought-provoking text.

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