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Making Learning a Game

Introduction. As a university lecturer I enjoy playing games with learning goals in mind. My students are all adults who work in many different roles. Their shared interest is a commitment to educating adults, usually those within their own workplaces. They study with me as part of a mature–age tertiary study program. Their needs include learning how to design activities that will support acquisition of practical skills, extend personal understanding of emotional factors, and improve awareness of factors – such as economic, ecological and political aspects of society.

As we work through the course of study the students learn to design, manage and activities for use in nursing, computing, policing, art and language education, management skills and legal practice contexts. Their employers range in size from 15 people to 20,000 employees. We have published eighty designs for a wide variety of learning purposes (Leigh and Kinder 1999; Leigh and Kinder 2001) and are in use from Nowra (in NSW, Australia) to Novosibirsk (in Siberia) and many places in between.

The design process, which I will introduce in my workshop at the conference, can transform local needs and ideas into learning activities that can be used almost anywhere. The core principles remain stable while the simplicity of each new design can be very complex indeed depending on the type of analysis completed by individual designer. When you read the words used to describe how to present an activity it seldom tells the casual reader much about what might happen if they choose to use it. Indeed words alone will seldom really be able to convey the emotional content of a well-designed activity.

The steps involved in the design and use of a simulation or game include i) identification of a problem, ii) exploration of its causes and characteristics, iii) identification of ways to simplify and represent the key elements, iv) selection of items to use in creating an effective representation, v) on-going review of the way all these things interact.

Play as a Means of Learning. It is a core contention of my work that somewhere along the way to adulthood we lose the capacity for spontaneity, regarding ‘education’ and ‘fun’ as diametric opposites. Neither occurs within the other we are told; one is more important for ‘success’; too much of the other impedes ‘progress’ – and I do not even need to say which is which!

Plays... is a cross-cultural universal, expressing in an almost unlimited variety of ways the primal biological urge to move, explore, discover, risk, test, master, create and... have fun. At its very roots it is free, spontaneous and creative [it] is justifiably an authentic end, a way of being, in and of itself... Play is a miniature laboratory in which children are protected and allowed to experiment. Children carry on play activities as long as they are interested...it is only adults who are under the compulsion of completing a formal task or of meeting set requirements. (Jensen and Scott 1980)

Why does this happen? How can we lose, so carelessly, our ability to enjoy life in the way that we do as did when we were children? Why do we accept these compulsions of adulthood? These are fascinating and difficult questions – but the most interesting one for me, as an educator, is how to create learning contexts that recreate the same level of interest that keeps children engaged in doing things that appear to have no ‘educative’ purpose.

I love to play and have fun whether I am working on serious projects or technical skill transfer. My mission is to help others regain the pleasure of having fun while they are learning – and to let go of the apparent fears that prevent introduction of play into formal learning.

Must learning always be a serious affair? The short answer to this question is «no!» The philosopher Plato, asserted that:

Enforced exercise does no harm to the body, but enforced learning will not stay in the mind. So avoid compulsion, and let your children's lesson take the form of play. (Lawrence 1970)

And the early Christian educator St Jerome advised the parents of a young girl:

Everything that makes learning pleasant and that promotes effort is commended. The teaching of the elements...is to be done through play...she is not to be scolded if she is slow to learn; praise must be the main inducement to real effort... Care is to be taken that her lessons are not made distasteful. (Lawrence 1970)

Yet, despite the efforts of these advisers, the results of most current collaborations between educators and architects create highly formal contexts which position the 'knower' and 'learner' at different 'levels' of authority, suggesting that they believe that 'fun' and enjoyment must be removed from the 'teaching' space if there is to be any 'real' learning. In Sydney, where I teach, the windows in the classrooms in our 26-storey main campus building begin at shoulder height on a tall person. As the 'teacher', I am the only who can see the glorious views over the Sydney night time skyline – and then only when I am standing!

Think back to your own childhood. You learned so much from playing with other children – from physical balance and counting, to appropriate social manners and communication skills. This early learning still informs our daily activities. Where did we learn what we know about communicating effectively with our peers? How much of it was gained in serious formal conversations seated decorously on hard benches under the direction of a stiffly formal adult? And, conversely, how much is actually the real purpose of hectic games like 'chasings', hopscotch, football, and all the games you and your friends designed that made use of the trees, water sources and structures where you played?

Is the person who is 'you', more truly created by the classroom formality of your school days or the hours of 'unstructured' of play, once school was over each day? I hasten to add that this question is not intended to denigrate school – but to help you bring to mind the other forms of learning that helped you to become the adult you now are. I believe that both school and play 'taught us'. For reasons that escape me, we call one a 'learning experience' and the other 'play' and do not see that each can also be the other. 'School' can include play – and 'play' can teach. We enjoy one (and do not see the 'learning' happening) – and endure the other (when it does not include the possibility of play)!

How to design 'Play-full' learning? When we learn about the process of designing education we are told that it is a serious enterprise, using models and highly abstract structured images that purport to tell us how to do it. Whatever methods we are given they seldom – if ever – include word 'fun'. Nor do their promoters mention that such models were usually not created using the conditions of the model itself! Few designers admit that any kind of messiness precedes the clarity of their final product. Dick Duke, broke silence on this matter. Having described in close detail the design processes and strategies he uses for development of environment and town planning games – in his book 'Gaming: the Future's Language' (Duke 1974) – he says that designing games for learning often occurs in this way –

- Initially there is a stage of muddling about
 - This is an iterative process as different perceptions of the problem emerge
- Assemble all known elements – without concern for their coherence
- Sort it into groups (according to any defensible logic) – arrange these into temporary clusters
- Organise it conceptually (he uses a detailed conceptual wheel)
- Look for conceptual explanations that accurately explain the phenomena
- Test them for internal coherence

Duke calls this a 'bass-ackward' analysis. This is a 'play-full' word representing the paradox of having to present a concept in a logical/linear manner when it has actually been 'discovered' in a manner too easily dismissed as 'unscientific'. Although it arises from both

intuition and hard work, this 'emergent' form of designing learning is discounted as being 'less proper'. The 'look-forward' focus of much educational design inhibits recollection of its 'bass-ackward' origins unless we can acknowledge that it is also valid, and can remember to look for it.

What do you need to know to design a game? In fact there is not a lot you need to know to begin designing games. Children do it effortlessly – and seldom worry about recording their designs, knowing they can do it again 'next time' with whatever comes to hand. The basic components are thousands of years old – perhaps some of the central design elements of human society. And there is no shortage of new designs around us. It is somewhat like composing music. There are only a limited number of notes of music, yet musicians both 'design' and 'improvise' new compositions endlessly. Their ability to do so hinges on their familiarity with the way that music works. Similarly game designers learn the elements of their craft and acquire the skill to 'design' and 'improvise' learning that is both fun and powerful.

There is however a great deal to learn about how to make simulations and games into the complex and long lasting activities that can be used around the world, in varied contexts and different cultures. This is an aspect of the complexity that probably makes educators uneasy. The obvious simplicity and the hidden complications deter novice users, and it becomes easier to rely on the 'tried and proven' teaching methods that we know are less engaging but are also safer vehicles in which to convey our knowledge to others. This aspect of the design and use of simulation and games will be explored further in the conference workshop.

Creative Copying. One of the inevitable results of this endlessly playing with basic components is what a friend, Barry Moore, called 'creative copying'. By this he meant that we are in fact being highly creative and original in what we are bringing into existence – yet we also owe to many others a debt of gratitude for the ways in which their ideas have provided resources for us to draw on as we engineer our ideas into existence.

In what follows I will introduce seven key elements that I consider to be the 'building blocks' with which we can play with our design goals and begin to create unique and original activities that have – nonetheless – many factors in common with all other designs. These seven elements are in two groups. The first concerns the way in which each activity is 'sequenced' – that is the order in which things occur. This must never be varied – and is very rigid in its form. The three sequencing elements are the briefing, the action and the debriefing. The remaining four elements concern the construction of the activity and are the rules, the roles, the scenario and the records. These are never sequential, and in fact are moulded together in a way that often makes it quite difficult to distinguish among them – at least while you are engaged in the activity itself.

The Sequence of Events. Every activity – like any good story – must have a beginning. In simulations and games this is called the 'briefing'. During the briefing the person managing the process (called a facilitator, or sometimes the G.O.D. – for Games Overall Director) is in charge. They are the only one who knows about what lies ahead and must capture and retain the attention of all participants for the duration of the 'briefing'. This is usually the shortest of the three parts of the sequence, and all the power conventionally held by a teacher is in the hands of the facilitator. Then they must step aside completely from all exercise of 'power' during the next section of the activity! The middle section is called the 'action', and the facilitator has almost nothing to do except observe, and occasionally (if the design requires it) distribute additional items or information in accord with the design instructions. During the action the participants are creating the experience, developing a sense of what is involved in the theme or idea, concepts or environment that is being represented by the simulation or game. While much learning is happening it is seldom the focus of

participants' attention – their interest is in generating the action, playing their roles and achieving the goals that the activity sets them.

The final section called the 'debriefing' or reflection is the time during which the learning is brought to mind. Participants are encouraged to recall their experiences, name their emotions, describe their own actions and interactions with others, and reflect on the meaning of what they have created together. These three components cannot usefully occur in any order than this. However it is true that some activities specifically structure their design so that there are several action/debriefing cycles as participants take action and then reflect on the consequences of their actions, before deciding on further actions to take in the next 'round' of the activity. In other words the 'middle' and the 'end' of the story may be 'told' many times before the activity draws to a close.

Throughout the sequence the facilitator must take great care not to impose their ideas or beliefs or concerns on the participants. Where a particular design requires a facilitator to intervene in some specific manner they must be explicit that this is entirely in the context of the design. That is they must not draw on their own perceptions or insights during this time. To do so provides an 'escape clause' for participants wishing to deny the implications of their actions.

The construction elements. The remaining four elements combine to bring a simulation or game to life. As noted above, these elements are the rules guiding the action, the roles participants adopt, the scenario within which they operate and the recording processes – and any physical records – preserving the learning outcomes and providing the means to identify and draw on events to discover new knowledge and understanding. Unlike the structural elements the construction elements are not arranged in any particular order but are interrelated drawing one and contributing to each other to create the 'whole' – much as a playwright uses similar elements to create the drama of a play. In effect the rules guide the participants to enact their roles and create the action which produces records of their lived experience of an activity's scenario.

How do these elements combine? When I first encountered Duke's 'bass-ackwards' approach to recording my design processes I was delighted. He was acknowledging that the fully realised design is more the product of many repeated trials and failed attempts than the result of a single monumental effort. To help guide me through these many iterations of the design process I have adopted Jones' wonderfully simple arrangement of four key questions (Jones 1985):

- Who are the learners?
- What is the 'problem'?
- What do the learners have to 'do'?
- What materials do they have to do it with?

The most important thing to understand about these four questions is that they can occur in any order, and will do so repeatedly before you have achieved a design that meets your particular needs. For example –

- If I need to design an activity that is intended to teach people about a specific tool, then the question of 'What materials do they have to do it with?' is answered for me – I must use the tool; if I have a set of resources, (such as overhead projector transparencies) containing the information to be learned, then I must include them
- If this is not the case I may begin with the question of 'Who are the learners?' For example when I am designing a workshop, I may know that the participants are business managers, and that they need to learn such things as teamwork, management skills, communication skills, etc). Knowing this I have an initial answer to this question, but later on I may need to know more precisely 'who they are'. For example are they newly appointed to their positions? Are they experienced managers being appointed to new and different roles?

Are they part of a business that is being merged with another, and therefore need to understand how the new business operates?

- If it is a skill to be taught you may begin with the question ‘What do the learners have to do?’ and begin my design process by thinking about the kinds of actions that may be involved. For example – I want to teach my son to ride a bicycle. He will have to be able to understand how to keep his balance as the bicycle move forward. So I may begin the learning by asking him to stand on one foot and hold his balance while he tells me how easy or hard it is. Then he might change to the other foot and examine how well he can balance, and then hold both arms out in front while he shifts from one foot to the other. Thus the task he has to do is ‘balancing’ on the way to learning to ride a bicycle.
- Finally – if the question is ‘What is the problem?’ a different starting point is needed. For example, I have a class of students who want to learn how to design games. So the ‘problem’ is ‘they don’t know how to design games’. Using conventional educational design I might begin with an input of relevant theory via a lecture. Or – since I try to always model my teaching principles – I can begin by playing a pre-existing game with the learners and then use their experience to de-construct the elements of this activity and identify what they think is involved in the design process, and only then reveal what the theories say. Thus I have played with the ‘problem’ and focused attention on the way in which such play can support and enhance learning through experience.

Knowing how adults learn. As unique human beings we each have personal learning preferences and modes of behaviour in learning contexts that influence how we respond to learning opportunities. Frameworks with which I am familiar include the Myers Briggs type Inventory (MBTI), the Learning Cycle developed by David Kolb and modified by (Honey and Mumford 1986), and the Team Roles Inventory of Meredith Belbin (Belbin 1996). There are many varieties – indicating the wide variety of perceptions about what learning ‘is’, how different people consider that it occurs and what is regarded as necessary for creating effective learning contexts and environments. There is a great deal of disagreement about how human beings learn, and even more dissention when it comes to considering how adults learn. For myself I accept that adults are simply ‘grown-up’ children, and that we began learning how to learn when we were very young. Our adult learning habits have been formed by such things as our experiences of learning while a child, our perceptions of ‘good teachers’ and our understanding of the concept of ‘knowledge’ (to name just a few factors influencing how we think about learning’!)

My guiding principle is that our response to the question of ‘what is learning’ is more likely to describe our ‘preferences’ about how we learn, than being a statement of absolute truth about how human learn. We each think about ‘learning’ differently and have found that we prefer to learn (and be taught) in different ways. When a very strong influence has closely shaped our experiences it may be difficult for us to break away from resulting habitual ways of thinking and may find that we are not readily able to adapt to different forms of teaching requiring different forms of learning. As intelligent adults we can access all the learning processes described in model of learning, but our life experiences and ‘natural inclinations’ tend us towards some behaviours/preferences and away from others.

Once human beings understand there are many ways to learn, and quite different ways of taking in and processing information, they can think more clearly about their own preferences, and simultaneously appreciate the immense diversity of ‘ways of being’ that are as valid as – yet quite different from – their own. Developing an awareness of the diversity of ways in which people learn, can assists individuals and groups value the diversity among adult learners and to use this variety constructively for improvement of their particular contexts.

In designing and using simulations and games it is vital to remember that their own ‘different-ness’ can unsettle an individual’s ‘taken-for-granted’ assumptions about the

'rightness' of particular approaches to teaching and learning. This 'unsettling' of such norms may be exactly what the designer intends in order to introduce new possibilities and options. Appreciating that we learn in different ways helps sustain a focus on what is to be learned and remind the learners of the potential for fun even in the midst of highly 'disturbing' activities.

Chaos theory – a guiding set of principles. Heisenberg's 'uncertainty principle' is a familiar concept to physicists but – as yet – is less well known in the social sciences. In the 1920's Heisenberg showed that experiments designed to detect light as a particle did so, while experiments designed to show that it is a wave – also did so! – but that it is not possible to research properties of light as a 'wave' and a 'particle' simultaneously. In doing so he demonstrated there is no possibility of the absolute truth at the 'quantum' level, and that the search for proof of propositions about 'predicability' could never succeed.

Even in principle Heisenberg said, «we cannot know the present in all detail. For that reason everything observed is a selection from a plenitude of possibilities and a limitation on what is possible in future». (Watson 2000)

The notion that 'what we observe is not nature itself, but nature exposed to our method of analysis' (Heisenberg in (Capra 1989) is a crucial principle for educators using games to introduce and support learning. It is a science principle that helps to emphasise how the complexity, and sheer indeterminacy of a simulation or game can be its greatest strengths! As we come to accept that we do not know many things 'for certain' we begin to feel more comfortable about becoming engaged with the process of exploring the possibilities emerging from well designed, well managed activities. In a conversation with educators I recently heard Heisenberg's principle described as «The quantum physics thing of what you expect – happens!» and found this a helpful way of encouraging adults to consider our own 'expectations' especially when we 'expect' certain things to happen and encounter something quite different instead.

At such times some adults begin to experience a 'cognitive dissonance', creating what Jack Mezirow (Mezirow 1990) calls 'disorienting dilemmas', which can encourage – or deter – adults from being able to accept the learning gained from new experiences. One significance of this 'dissonance' is that the individuals experience it as an emotional response that they may not readily be able to express clearly. Since education is regarded as an unemotional and objective process, the entry of feelings into the learning space can be very unsettling for everyone present.

Understanding some key 'chaos' principles as they are being explored in scientific circles can provide a stabilising base for educators to help them prepare for the emergence of unexpected emotions and related unsettling responses. Figure 1 introduces four key 'chaos' principles and identifies a way of thinking about them in regard to educational contexts. While these chaos concepts have been explored in mainly numerical sciences, my application of them to human behaviour is in line with the work of such writers as Meg Wheatley (1993). An important point for consideration is that while all human beings are unique we also share many characteristics. Simulations and games bring together these similarities and differences to create the endless variety of activities, and differing learning outcomes, for each new group of learners.

Chaos concepts provide a basis for thinking ahead about possible learning that may emerge from the action. The design of a simulation or learning game will tend towards creating a limited set of learning possibilities, because of the designer's goals and intent. However participants bring their own concerns, prior learning, experiences and needs. These interact with the elements of the design and create the unique experience that is the next new iteration of the simulation or game. For example, chaos concepts help us to understand that each activity has a unique set of factors at the beginning. What happens next is 'sensitively dependent' on these unique factors. The uncertainty of not knowing the outcomes beforehand can be both stressful and perceived to be a flaw in the educational process – at least this can

so when prior expectations are based on a belief that education must be orderly and pre-ordained! These interactions create patterns that will be both ‘the same’ and yet uniquely different on each occasion. Similarly an understanding of chaos concepts can guide us in finding the order and sequencing that exists within the apparent disorder of a hectic simulation, and remind us to hold back on premature assessment of the action (perhaps the most important factor in ensuring that learning emerges in a way that makes it totally relevant for each new group of participants).

It is the emergent nature of learning in simulations that can be both puzzling and challenging in contexts that expect the outcomes to be predictable. Accepting that learning comes forth from events allows us, as educators, the freedom to grow with the participants while contributing our specialist knowledge to extend their discoveries and support their explorations. Using this understanding as a framework for working with learners provides opportunities for creativity, innovation and exploration – but brings that uncertainty with it!

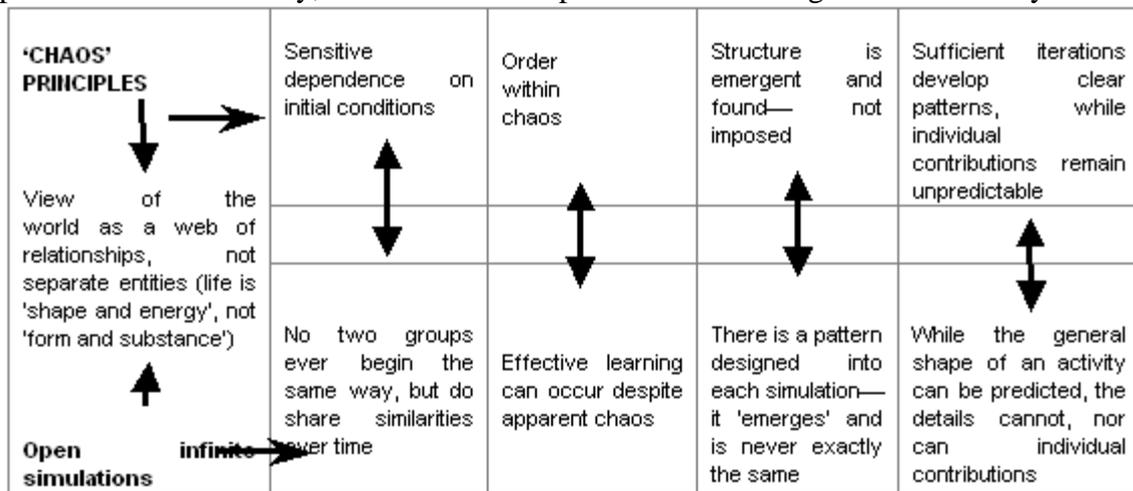


Figure 1 – a set of relationships between ‘chaos’ concepts and particular forms of simulations.

Summary. Designing simulations and games is a highly personal activity – however many members there may be in the design team. Yet particular designs can be relevant to many diverse contexts, while some can be one-time designs unique to a particular context. Cultural, personal and contextual factors are all involved in the design process, and the resulting products. All designs are combinations of the seven components listed in this paper. They vary endlessly and yet share common characteristics, while their uniformity of origins and endless diversity of forms distinguishing this form of learning design from any others. Whatever a facilitator does, the outcomes of a game will include an interplay of factors that cannot be fully controlled. Apparent simplicity conceals the real complexity that is involved. Inhibitions about ‘fun’ and ‘laughter’ impede application of games to learning contexts but need not prevent us from playing with the learning.

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