

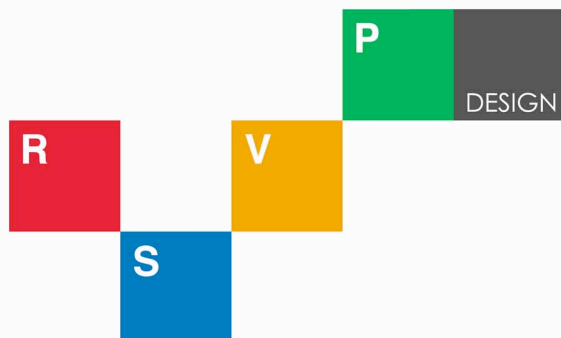
REAL Business Learning Environments: Design Considerations in the Integration of Business Simulations into Rich Environments for Active Learning.

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Abstract

This paper describes the development of experiential learning environments based on the research of Grabinger et al (e.g. Grabinger and Dunlap, 2000) whose research introduced the term Rich Environments for Active Learning or REALs. Application of this research has been heavily directed towards e-Learning Dunlap and Grabinger (1992) and the teaching of science and technology e.g. Willis, Means and Love (1999), although Zantow, Knowlton and Sharp (2005) have recently considered its application to PC driven Strategic Management Simulations with some optimism.

In this paper I describe a design model and checklist, developed within RSVP Design Ltd. through which Simulations, both Behavioural and Strategic Business, may be embedded as the key element of business learning environments that are based on REAL principles.



Background - A Constructivist view of Learning Environments

A Learning Environment is a generic term for where learners learn – either an electronic space or a physical learning setting.

The exposition of a Learning Environment based on a constructivist view was developed by Grabinger et al (e.g. Grabinger and Dunlap, 1995) who coined the term REALs – Rich Environments for Active Learning.

REALs are comprehensive instructional systems comprised of a number of strategies and educational technologies.

The purpose of REALs is to engage learners in dynamic, authentic, generative learning activities. Key to the achievement of this purpose is to give the learner increased control and responsibility over the learning process. In accepting this control and responsibility the participant in the REAL learns not only the content of the learning module, but also acquires life-long learning skills such as problem-solving, critical thinking and collaboration. (Dunlap and Grabinger, 1992; Grabinger and Dunlap 1996; Grabinger and Dunlap 1994a; Grabinger and Dunlap 1994b; Grabinger, Dunlap and Heath, 1993)

REALs are based on a constructivist view of learning which holds that knowledge is acquired through

“a process of subjective construction on the part of the experiencing organism rather than a discovering of ontological reality” (von Glaserfeld, 1979, p.109)

Thus learning is a student-centred process. It is also a process of negotiation and conversation (Johnson, Johnson and Smith, 1998; Pask, 1976), testing and challenging (Bauersfeld, 1995; Cobb, Wood and Yackel 1990)

Attributes of REALs

Specifically REALs:

- Encourage the growth of learner responsibility, initiative, decision-making and intentional learning.
- Utilise dynamic, interdisciplinary, generative learning activities that promote high-level thinking processes (i.e. analysis, synthesis, problem-solving, experimentation, creativity and examination of topics from multiple perspectives)

- Enhance learners' domain-specific and generic cognitive and metacognitive skills development (Schon, 1984)
- Help learners to integrate new knowledge with old knowledge and thereby create rich and complex knowledge structures promoting understanding, pathways, and links between ideas.
- Enhance the ability to organise concepts into categories and, thus, recall specific concepts and concept labels
- Promote study and investigation within authentic (i.e. realistic, meaningful, relevant, complex and information-rich) contexts
- Cultivate an atmosphere of knowledge building learning communities that utilise collaborative learning between learners and facilitators (Collins, 1995)

RSVP Design and REALs

In an experiential education setting, RSVP Design began to apply the REAL attributes to business education settings with the intention of creating a style of executive development that was more dynamic and transferable than the instructor-driven learning environments that are characteristic of much of the 'MBA – learning' prevalent in current executive education (Mintzberg 2004)

RSVP Design considered the nature of REALs as a fusion of four different and complimentary learning technologies (cooperative learning, generative learning, student-centred learning, and problem-based learning.)

Taking each technology in turn they considered the needs of adult learners and the way that each technology could be used to create learning environments that were a better reflection of the working worlds where the learning achieved was to be applied.

Cooperative Learning

Cooperative learning brings together individuals to work in small groups to analyze, synthesize, collaborate, and agree on a solution to the issue they are resolving. Participants work together to build and refine knowledge with their peers. These workgroups develop self-regulation through the management, monitoring, and evaluation of the learning experience. Cooperative learning demands that people learning together accept responsibility for their own learning.

Johnson and Johnson (1994) give us a working definition of cooperative Learning as having the following five elements:

1. Clearly perceived positive interdependence
2. Considerable promotive (face-to-face) interaction

3. Clearly perceived individual accountability and personal responsibility to achieve the group's goals
4. Frequent use of the relevant interpersonal and small-group skills
5. Frequent and regular group processing of current functioning to improve the group's future effectiveness

In the RSVP Design model Cooperative Learning enables the building of the vital workplace skills of working collaboratively to deal with new situations and new challenges. The visionary leadership, facilitative management and knowledge management encouraged within the REAL environments are transferred beyond the learning environment.

Generative Learning

Generative learning is the type of learning where students become investigators and 'teachers' become facilitators of knowledge. Generative activities are facilitated through workgroups where participants need to move between roles and collectively problem-solve by discussing their insights into, and opinions about, the subject matter. Generative learning involves students in higher-level thinking processes and helps learners to integrate new knowledge within the structure of old knowledge. Facilitators raise work-related questions that the participants to investigate and then apply the knowledge they have acquired through the production of a tangible output.

Jonassen (1985) identified four different categories of Generative Learning strategies, i.e.

1. Recall – memorisation and regurgitation of course content. (In the RSVP Design model this is given little emphasis as adult learners tend to have had considerable opportunity to develop this strategy during their prior education.)
2. Organisation – learners organise information in a way that makes sense to them. By using their own criteria to create this organisation the learner is more likely to learn as they are, in fact, rehearsing the information in order to create the organisation.
3. Integration – connecting new knowledge to existing knowledge. As learners integrate new knowledge into their existing knowledge structures they are building on what they already know and constructing deep and unique personal understanding of the new knowledge set.

4. Elaboration – learners take the new knowledge that they have extracted from the learning experience and now apply it to the real-world situations that they encounter or envisage.

In the RSVP Design model the inclusion of Generative Learning demonstrates a profound respect for the skills, knowledge and experience of adult learners. This is a recognition and acceptance that in most cases adult learners have a far greater hands-on experience of the workplace issues that they are trying to deal with than do the facilitators of learning – and that they bring this experience with them into the learning experiences that they enter.

In the RSVP Design model, the use of Generative Learning enables the building of personal and team competencies that are applied to real workplace issues and sticking points. At its heart is a belief that gearing learning experiences to address, directly, the issues that are the cause of workplace problems is a powerful demonstration of what training should be about.

Student Centred Learning

Student centred learning environments focus on the development of critical thinking and life-long learning skills, primarily; questioning, metacognition, and reflection.

- Questioning - when learners generate their own questions in response to a particular topic they are using a higher level of active participation in the learning process. They are generating the direction of their learning experience, giving them more ownership of the learning and making the learning more personally relevant.
- Metacognition - this is the process where the student takes conscious control of the learning. The learner thinks about how they are thinking in a cognitive sense. For example, the learner is using metacognition if they realise that the teamwork problem that they thought they had is in fact a problem of imprecise communication.
- Reflection - this is where the learner observes, interprets, and reflects upon their learning experience. This reflection would include the 'who, what, where and why' of the learning experience.

Key elements of a Student Centred Learning approach have been suggested as:

1. Deep learning – in contrast with surface or strategic learning
2. A high proportion of the learning experience is active

3. Reflection is seen as an important part of the learning experience

(Bolander 1999)

In the RSVP Design model, the use of Student Centred Learning enables the development within each individual of a unique and personal set of learning skills that are fundamental to becoming an active member of a learning organisation. In business environments where things change fast there is strong evidence that every individual needs to be a skilled and compulsive learner Pedler, Burgoyne and Boydell(1978)

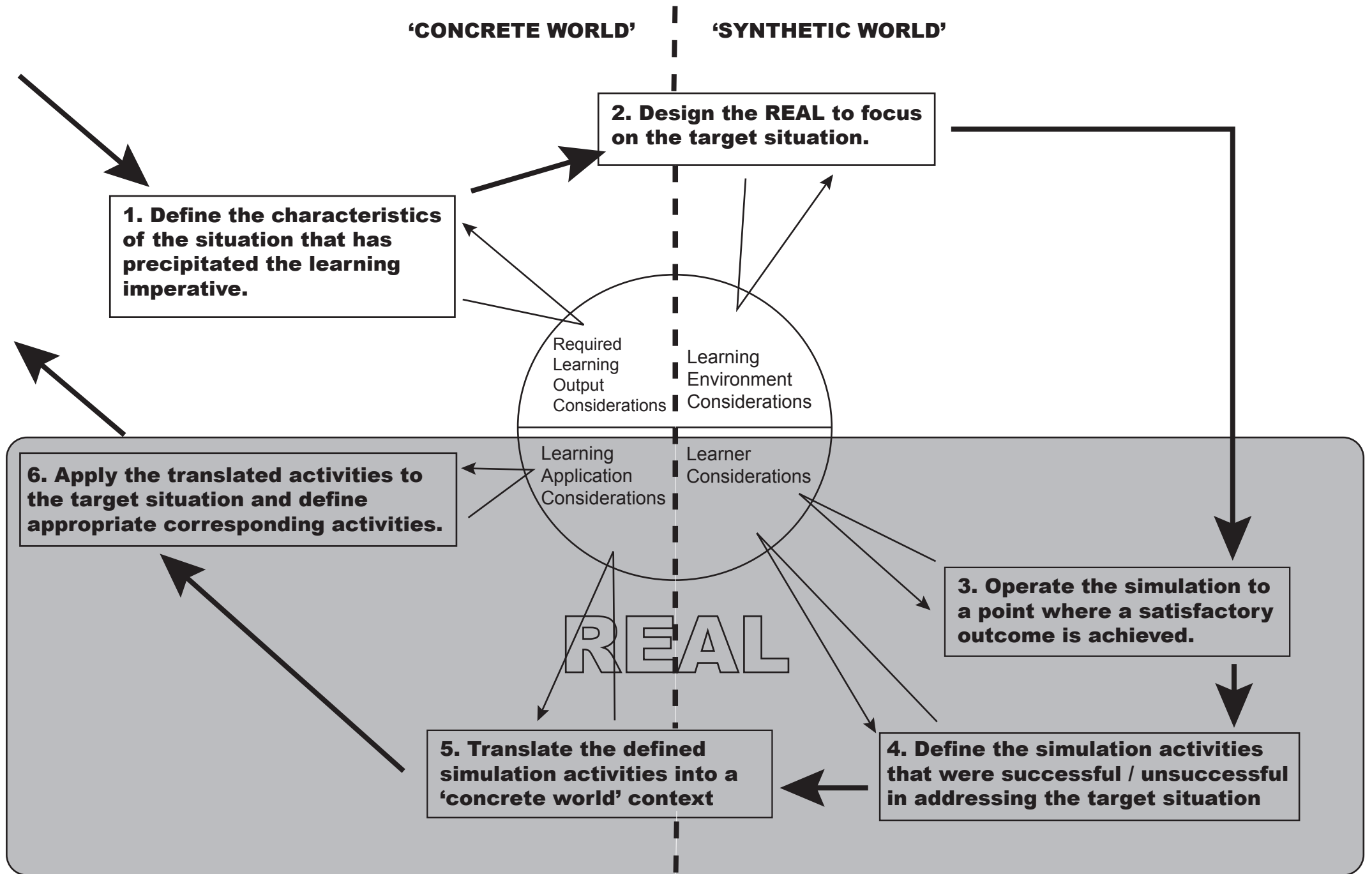
Problem Based Learning

Problem based learning is the type of inquisitive and investigative education for which there is no clear answer or procedural rule. It is an environment where knowledge is constructed and not received. Problem based learning activates prior knowledge, transfers learning and integrates the new knowledge within the structure of the old knowledge. In addition, problem based learning involves students in real problems (often work-based), where they must analyse, synthesise, and hypothesize information to determine possible solutions to a situation, topic, or problem.

In the RSVP Design model, the use of Problem Based Learning facilitates the rehearsal of the increasingly familiar business situations where unprecedented circumstances require new thinking to generate appropriate solutions. Fundamental to this is a belief that having well-programmed strategies for dealing flexibly with the unexpected is a capacity that few organisations can safely do without.

Blending the Four Educational Technologies

As with any well conceived business intervention there needs to be a considerable investment in design so that the data that drives the REAL is grounded in the realities of the organisational situation it is meant to address. **Diagram 1** describes the process steps of this design and subsequent delivery, illustrating the positioning of the REAL within a fairly conventional model for the design of a learning intervention.



At the heart of a Rich Environment for Active Learning created according to the RSVP Design model is a behavioural simulation or Strategic Business Simulation (a Microworld or a Simuworld) that addresses the desired learning area through a challenging 'synthetic environment' The emphasis placed on this experiential element is supported by two areas of research, i.e.

- the perceived efficacy of simulations as a vehicle for individual and organisational learning (Keys, Fulmer and Stumpf, 1996)
- the strong mutual benefit that can be achieved through the integration of simulations and Generative Learning Environments (Zantow, Knowlton and Sharp, 2005)

The simulation activity sits at the centre of a six-stage process which takes a group of learners from first formal contact with the imperative to change to controlled application in the concrete world of the strategies and tactics rehearsed within the simulation. This process closely follows the Kolb experiential learning cycle (Kolb and Fry 1975)

- A. Sensitisation to the need for change – supporting activities and value statement
- B. The core 'Synthetic World Activity' i.e. behavioural simulation or Strategic Business Simulation (a Microworld or a Simuworld)
- C. Comprehensive task and process review
- D. Definition and translation of the strategies employed in the simulation
- E. Selection of appropriate 'concrete world' change-oriented actions
- F. Planned application of these actions

Diagram 2 places this six-stage process within the design and delivery sequence of Table 1.

Adherence to the design model should create a framework within which the four learning technologies detailed may be consistently and appropriately applied to authentically generate a REAL. To monitor that this is in fact happening we need to carefully examine the pedagogic approaches operating at each of the 6 stages of the delivery process.

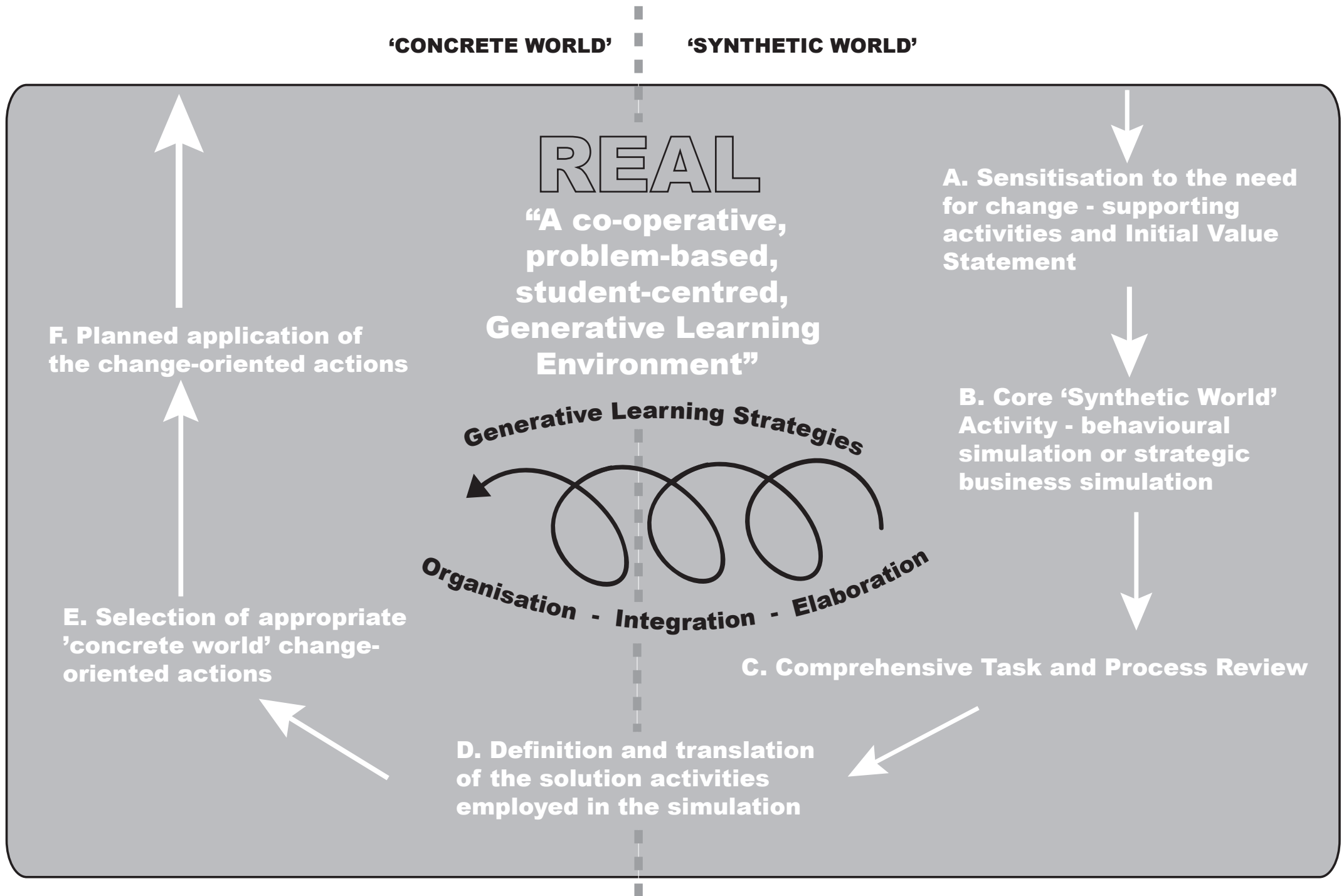


Table 1 offers a checklist that may be used to ascertain whether the delivery of the REAL is consistent with the design aspirations i.e. Is what is being delivered a REAL?

Design checklist for REALs that are organised around behavioural simulations.

Pedagogic Principle	Learning Technologies Operant in REAL	Design Features of the REAL Learning Experience
<p>1. Social construction of knowledge - that learning is enhanced through the process of the communication of ideas, which involves interaction and reflection. (Vygotsky, 1962)</p>	<p>Co-operative Learning</p> <p>Generative Learning</p> <p>Problem-Based Learning</p>	<p>a) Has the learning environment sufficient challenge, variety and complexity to encourage learners to collectively explore possible courses of action before deciding on actions to be taken?</p> <p>b) Has the learning environment an appropriate duration and degree of repetition so that the learners have the opportunity and encouragement to revisit this exploration of possible approaches?</p> <p>c) Does the learning environment include periods of activity and times for reflection to allow the effectiveness and impact of current approaches to be experienced and reflected on, both individually and collectively?</p>
<p>2. Transparency of Action-learners need to know why they need to learn something before undertaking to learn it. (Knowles, 1990)</p>	<p>Student – Centred Learning</p> <p>Problem-Based Learning</p>	<p>a) Is there sufficient initial context building that explores the concrete world imperative for the desired learning and culminates in a clear statement about the target learning?</p> <p>b) Is there a progression of activities so that the consequences of</p>

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		particular courses of action may be learned in order to inform choices about subsequent actions?
3. Experience is valued – experience is a 'subjective' resource that can be applied to learning. (Knowles, 1990)	Generative Learning	<ul style="list-style-type: none"> a) Does the learning environment encourage and offer opportunity for learners' prior experience to be considered and selectively utilised? b) Do elements of the learning environment encourage learners, individually and collectively, to make connections with similar or parallel prior experiences?
4. Authentic activities – learning is oriented to the application of knowledge and problem solving that relates to the learners' real life contexts. (Dunlap and Grabbinger, 2000)	<p>Generative Learning</p> <p>Problem Based Learning</p> <p>Student Centred Learning</p>	<ul style="list-style-type: none"> a) Has there been included sufficient close examination of the learners' organisational or social context in order to design or select learning activities? b) Has there been appropriate simplification of the concrete world context to define, isolate and emphasise the desired learning outcomes? c) Is there a robust and comprehensive review process that bridges the synthetic world learning and its application to the concrete world?
5. Learning is Generative – there is a need to actively organise knowledge into a structure that reveals relationships between ideas, conflicts and gaps in knowledge (Grabbinger and Dunlap 1996)	<p>Generative Learning</p> <p>Co-operative Learning</p> <p>Problem Based Learning</p> <p>Student Centred Learning</p>	<ul style="list-style-type: none"> a) Does the synthetic world have a sufficient degree of attractiveness, complexity and responsiveness to allow full learner immersion and holistic engagement? b) Does the design allow

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		sufficient time for the synthetic world to develop and emerge in response to the actions and needs of the learners who populate it?
6. Diversity of voices – voices of key writers, policy makers, practitioners, and students are included to ground theory in practice.	Co-operative Learning Student Centred Learning Generative Learning	a) Does the design represent the design involvement of multiple stakeholders? b) Is there timely reference to the models and research that support the desired and actual learning and its application in the concrete world?
7. Assessment encourages higher order learning and reflects all REAL learning activities. - ' ... contextualised, complex intellectual challenges rather than fragmented, static, multiple-choice measures'. (after Wiggins , 1989)	Co-operative Learning Student Centred Learning	a) Is the assessment designed to be an extension of the REAL methodology? b) Has every opportunity been taken to integrate this assessment into existing organisational or social practices (appraisals, peer observation etc.)
8. An androgogic approach to learning - the creation of a partnership between the learner and the teacher, negotiating goals and content in the course of knowledge delivery (Knowles 1984).	Generative Learning Co-operative Learning Problem Based Learning Student Centred Learning	a) Are the facilitators and support staff willing and able to work in the learning environment demanded by the REAL? b) Are the learners sufficiently well prepared for the style of learning they will experience in the REAL? Do they, or will they, understand the expectations that this style of learning places on them?
<p>Answering each of these questions should be a good design check to ensure that a learning environment has been designed to meet REAL criteria. However, experience suggests that it's easy to have designed all the fun out of the experience that is being designed. Here's one last area to examine in order to ensure that learners will be motivated to learn.</p>		

<p>9. Intentional learning – (rather than incidental learning) “the learners’ purposeful, effortful, self-regulated and active engagement” (Palincsar and Klenk 1992)</p>	<p>Generative Learning Co-operative Learning Problem Based Learning Student Centred Learning</p>	<p>a) Will this design get the full and active engagement of the target learners for the full duration of the learning event and more? b) Is there enough here to make it memorable for more than just the content?</p>
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Conclusion

There is a great deal of research evidence that supports the use of simulations in business education (e.g. Gosenpud 1990). Much of the literature that surrounds this research is descriptive from one of two perspectives i.e. the administrators tale or the learner’s tale, until recently little has been written to tell the designer’s tale at any length. Scott Aldrich offers an immensely valuable insight (starting from the statement that “the understanding of what a simulation consists of is scarily incomplete” in his Simulations and the Future of Learning (2004). Whilst Michael Schrage’s Serious Play (2000) offers a surprising amount of background context for any designer of simulations.

One key area that seems to have received little attention is the creation of an appropriate learning environment within which the simulation itself will be enhanced and supported. The table and diagrams in this paper focus on this area – ‘creating an appropriate setting within which jewels may shine’.

A key strategy for learning within REALs is described by Grabinger and Dunlap (1995) as Cognitive Apprenticeship, the goal of which is “to make processes that are normally invisible visible”. In the spirit of Cognitive Apprenticeship this paper is a first attempt at sharing the ideas about simulations and the way they are used. These ideas direct our learning and activities at RSVP Design - I hope that they will be useful to others engaged in parallel journeys.

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