Competencies for the Successful Use of Online Social Simulation Games within Organisational Leadership Development

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Abstract

The humble *Pong* arcade game at the corner store ignited a fundamental culture shift in the 1970s and it is increasingly gaining momentum. A generation of gamers is already permeating organisations. The socio-cultural phenomenon of digital gaming has become pervasive. The intersection point of the three trends, *Ubiquitous Computing*, *Ubiquitous Gaming* and *Social Networking* is the focus point of this study. It is at this intersection point that both social online gaming and cutting-edge leadership competencies co-exist and have the potential to flourish when implemented with caution and circumspection.

Social Online Simulation Gaming (SOSG) as a learning design and learning technology can prove particularly valuable as a leadership and skills development tool within the "digimodern" world. Current literature, however, does not provide a clearly focused framework for the implementation of ICT supported game-based Leadership Development technologies within the information economy.

There is currently not a clear and specific framework for evaluating the Information and Communication Technology (ICT) competencies, knowledge, skills and attitudes required to successfully use Social Online Simulation Games software within the context of Organisational Leadership Development. This study aims to create and refine a framework for evaluating the ICT competencies required to successfully implement SOSG as Leadership Development tool.

The primary research question is formulated as follows: *What ICT competencies (knowledge, attitudes and skills) are necessary to successfully utilise Social Online Simulation Games as Leadership Development technique and tool?*

A Mixed Methods research approach was followed in which the current literature has been reviewed, using an interpretative methodology and the principles of hermeneutics, in order to derive a preliminary conceptual model for the ICT-related competencies (e-Competencies) needed for the successful implementation of SOSG in Organisational Leadership Development. Subsequently, this conceptual framework has been refined utilising the input of an international panel of experts (through a two-stage Delphi ex-

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pert panel and further quantitative data analysis) in order to produce a framework for assessing the required competencies.

Significant differences between the agreement and consensus of Serious Games (SG) and Leadership Development (LD) groups of experts were observed. The differences indicate that the design and compilation of SOSG project implementation teams need to take cognisance of this reality and the aim to control it. It has significant implications on how the SOSG Utilisation Framework can be implemented in practice.

Our analysis suggests that the SOSG Utilisation Framework may potentially form a robust basis for further refinement of the competencies required to successfully utilise SOSG in Leadership Development applications within organisations.

Keywords: Social Online Simulation Games, e-Competencies, e-Competence Framework, e-Learning, Experiential Learning

Introduction

According to Bytheway (2003), it is relatively easy to formulate business strategy that aims to exploit the opportunities potentially offered by information technology. In the same vein, it is equally easy to spend money on perceived information technology opportunities. The real challenge lies in the space between these two factors. Ensuring that information technology adds value in terms of strategy realisation implies a myriad of challenges: *The problem lies in the space between these two, in the uncertain world of project management, systems implementation, business change management, benefits delivery, and performance management* (Bytheway, 2003).

For example, implementation of Social Online Simulation Games (SOSG) as Leadership Development tool within the developing world potentially faces the current challenge of varying levels of ICT competencies (knowledge, skills and attitudes), as identified in the European e-Competence Framework (e-CF) (CEN, 2010). This can hamper effective implementation of online simulation games to build leadership competencies in an organisation.

In the literature there is currently not a clear and specific framework for evaluating the competencies (knowledge, skills and attitudes) required to successfully use Social Online Simulation Games technology within the context of Organisational Leadership Development. Although various frameworks exist with the aim of explaining aspects such as computer mediated learning, e-Learning and technology acceptance, these models rarely focus on relevant underlying factors such as Flow Theory (Csikszentmihalyi, 1990) and Scopes' Cybergogical Rationale (Scopes, 2009) which better explain learner engagement within game-based learning.

These factors are also typically lacking in current competency models often utilised by organisations such as the European e-Competence Framework and other similar frameworks, i.e. the Canadian Occupational Skills Framework (ICTC, 2012), the United Kingdom's Skills Framework for the Information Age developed by the SFIA Foundation (2012), and the German Kompeten-zzentrum IT-Bildungznetswerk, developed by Kibnet (2012).

Given the currently observed increases in utilisation of game-based technology by organisations, such a framework may assist both organisational executives and managers tasked with conceptualising and implementing such projects.

The primary research question has been formulated as follows: *What competencies (knowledge, attitudes and skills) are necessary for organisations to successfully utilise Social Online Simulation Games as Leadership Development tool?*

The following sub-questions have been investigated:

- Do the current technology utilisation frameworks and/or models in literature provide an adequate typology of required competencies?

- Are any additional competencies required for Social Online Simulation Games utilisation?

- Can a rating and weighting of more critical competencies be suggested in the form of a framework?

- What can such a framework potentially look like in practice?

Literature Review

As a result of the increasing ubiquity of advanced computing abilities and technology within the knowledge economy, development of leadership competencies is essential to organisational survival and success (Broos & Cronje, 2009; Ward & Prosser, 2011). Within a post-postmodernist epoch, the utilisation of ICT supported Leadership Development technology needs to take into account the changing in the nature of learning itself, as well as the expectations of learners (Harteis, Gruber, & Hertramph, 2010; Kirby, 2006).

It may also be beneficial to investigate leadership as process ontology, rather than a static concept. This means viewing leadership in terms of processes, interactions and practices "*as socially constructed, emergent organising embedded in sociocultural contexts*" (Crevani, Lindgren, & Packendorff, 2010). According to Allen (2006), Leadership Development has been on the minds and in the writings of major scholars over the centuries, from Confucius to Plato and from Machiavelli to Napoleon. In order to arrive at a definition of Leadership Development, Scott Allen (2006), in his insightful PhD thesis, proposes a synthesis of fifteen definitions in the literature into four broader themes.

Allen arrives at the following definition, which we will also utilise as our operational definition during this study: *Leadership development is a continuous, systemic process designed to expand the capacities and awareness of individuals, groups, and organisations in an effort to meet shared goals and objectives* (Allen, 2006).

When we analyse the major leadership schools of thought as metanarratives, it becomes evident that several of these approaches, such as the Trait and Style approach, as well as the Leader-Member Exchange Theory, can be viewed inherently as metatheories.

If a high-level longitudinal analysis is done of the major leadership theories, the following elements become apparent in modern leadership thought:

- A gradual recognition of the inherently networked nature of leadership (i.e., Yukl et al. as cited in Hogan, Curphy, & Hogan, 1994)

- An increasing awareness of the high levels of self-awareness and authenticity required to be able to exercise truly flexible situational leadership (i.e., Walumbwa et al., 2008)

- A gradual move away from the strictly dyadic relationship between leaders and followers (i.e., Sydänmaanlakka, 2003)

- An increased pessimism of the "Leader as Hero"- model (Walton, 2007)

Kriz (2003) argues strongly for the role that simulation games can play in creating learning environments that can successfully develop usable knowledge and competencies, while enabling user control and situational focus, in our opinion a critical requirement of modern learning and Leadership Development.

The development of the World Wide Web has extended the social reach and social power of computer games, starting with the earliest text based multiplayer dungeons games (MUDs) of the 1980s. Hundreds of thousands of players were suddenly starting to interact with and participate in shared rule-based communities in an online and increasingly mobile environment. The Korean game Lineage for example attracts millions of players and lasts over years. Everquest and World of Warcraft sustain hundreds of thousands of players. A common element of these worlds is the negotiation of social rules of behaviour, such as property rights and even ethically controversial issues such as player-against-player killing (Murray, 2006).

Further analysis of the prevalence of these types of Social Online Gaming and its growing presence as a factor in modern culture is required in order to contextualise and evaluate its potential utility in Leadership Development. Roger Caillois, a sociologist, describes in his classic work, Man, Play and Games, all forms of play as being positioned on an axis between two extremes: Paidia and Ludus (as cited in Caillois, 1961). He describes Padia as "a primary power of improvisation and joy". The opposite pole, namely Ludus, is defined as "a taste for gratuitous difficulty", typically introduced by the system of rule being applied.

One of the most important elements of games, and especially simulation games, is the manner in which productive failure and creative adaptability is encouraged: *A lot of games give the illusion of freedom, but the formal structure of "how the game should be played" only allows freedom within these carefully constrained limits. True freedom in design gives the players the opportunity to wilfully fail at the task they have been given. By giving the player freedom to do this, they can generate their own goals that are not dependent on playing within the constraints of the "normal" way a game is played* (Kirman, 2010).

Kirman (2010) also mentions the fact that a lot of games are designed "either purposefully or by accident, with low barriers to non-linear play". Players are increasingly given their own tools to create their own experiences and these tools, "within the (even limited) game world have allowed players to engage in their own paidic and playful experiences".

The rapid development of massive social online communities have been fuelled by the meteoric rise of Social Networking sites such as Facebook (1 billion plus users) (Smith, Segall, & Cowley, 2012), QQ (300 million plus users) (Rossi, 2009), and many, even most, of the current generation of learners are enmeshed in connective technologies (Sontag, 2008).

Bruns (2009) also highlights the core function of these social media communities. These structures form inter-linking and often inter-dependent parts of the broader social media environment. Bruns defines the communities by the adherence of their members to a set of shared values, beliefs, norms and ideas. The community, and specifically the virtual communities formed in modern day online social gaming, presents a key structure that can be analysed in order to understand its impact and role in learning and specifically Organisational Leadership Development initiatives.

Some distinctive features of multiplayer, online games such as team collaboration, problem solving and group decision-making, have caused a lot of interest from practitioners in business, government and the military (for example, see Li, 2004).

Experimental freedom is one of the key aspects that have piqued social researchers' interest in applying games within the context of personal and Leadership Development (see for example Aldrich, 2005). If one uses the modern day corporation as example, there is a very apparent connection between the modern day business challenges (i.e. increasing compliance rules, large numbers of simultaneous actors, information overload, and an increasingly global focus, with all the complexity that it entails) and the procedural, participatory, encyclopaedic, and spatial elements of modern digital media and specifically digital gaming.

The term "simulation-based training" refers to a collection of training methods, all of which aim at bridging the gap between classroom knowledge and actual practice by placing the learner in realistic situations in the context of which he/she has to bring to bear his/her knowledge (of facts, tasks and procedures, and collaboration strategies) to solve a problem (Brown, Collins, & Duguid, 1989).

Our operational definition of Social Online Simulation Games (SOSG) for the purposes of this study is as follows:

Online Social Simulation Games is a serious game-based learning approach making use of online social networks to facilitate immersive and socially networked gameplay. These serious games include actors, rules, storylines, resources and simulation elements as building blocks and these socially networked gaming networks can range from a small group to millions of interlinked and interdependent players.

Our definition is therefore close to what Deterding (2010) would define as "Pervasive Serious Games".

Various authors have investigated e-competence frameworks such as the European e-Competence Framework 2.0 (Cristobal & Romani, 2009; Lanvin & Fonstad, 2010). These frameworks typically provide a reference framework of ICT competencies that can be used and understood by ICT end- users and supply companies, ICT practitioners, managers and HR departments, the public sector, and educational and social partners. e-Competencies have also been mapped against the Information Management Body of Knowledge (IMBOK) Framework (developed by Bytheway, 2003), linking ICT skills and the broader Information Management process (Mitrovic, 2010).

In our analysis and development of the competency framework required for successful SOSG implementation, we used the European e-Competence Framework (e-CF 2.0) as basis. The primary reason for our utilisation of the European e-Competence Framework as basis for our SOSG framework is the fact that the e-CF 2.0 already attempts to play an integrative role between the various available international frameworks (Lanvin & Fonstad, 2010).

With this study our aim was, through an interpretative methodology and the hermeneutic circle, to produce an exploratory framework for successfully utilising SOSG in Leadership Development within organisations.

Methodology

This study adopted a mixed methodology approach with the purpose of creating an initial conceptual framework to answer the research question and sub-questions. The current literature has been reviewed in order to derive a preliminary conceptual framework for the competencies needed for successful implementation of SOSG in organisational leadership training. In our study of the literature, various existing conceptual models and frameworks impacted our thoughts and thus also the suggested mapping of SOSG against the e-CF 2.0 Framework.

Some of these models included the Technology Acceptance Model (TAM and TAM2) (Park, 2009), the Task-Technology Fit Model (TTF); Computer Self-Efficacy Mode; TAM/TTF Model with Computer Self-Efficacy (Dishaw, Bandy, & Strong, 2002); and the Extended TAM model with Flow developed by (Hsu & Lu, 2004). This conceptual framework was further refined utilising the input of an international panel of experts through a two-stage Delphi technique, using an interpretative methodology and the principles of hermeneutics. Quantitative data analysis was conducted to further analyse and refine the data obtained during Round 2 of the Delphi panel process.

According to Lendaris and Geoffrion (as cited in Stitt-Gohdes & Crews, 2004), the Structural Delphi Model allows participants to individually express independent relationships/judgments and are used to produce a group or whole model or system. This methodology assisted in refining the competency framework. The Delphi expert panel process commenced with the development of a set of open-ended questions on the researched issue based on our literature review and its preliminary findings. These questions were then distributed to the panel members individually via a secure online portal.

Dimension 1 of the e-CF 2.0 Framework identifies five e-competence areas, derived from the ICT business processes, namely: PLAN–BUILD–RUN–ENABLE–MANAGE. Dimension 2 of the e-CF 2.0 Framework presents a set of reference e-Competencies for each area, with a generic description for each competence. There are 32 competences identified in total that provide the European generic reference definitions of the e-CF 2.0 Framework.

In Round 1 the respondents were asked to indicate which areas of KNOWLEDGE, SKILLS and ATTITUDES they viewed as important in the process of PLANNING, BUILDING, RUNNING, ENABLING and MANAGING the utilisation of SOSG in Leadership Development programs.

The Delphi Round 1 feedback on the open-ended questions was captured and thematically analysed in terms of the agreement with Dimension 1 and 2 of the European e-Competence Framework . Additional competencies identified were noted and integrated. The responses to these questions were summarised into the Pre-Delphi Round 2 Framework and a second set of questions, seeking clarification of areas of agreement and disagreement, was formulated and distributed to the same group of experts.

Panel feedback in the second Delphi round was done by means of a 5-point Likert scale rating (Strongly Agree; Agree; Neutral; Disagree; Strongly Disagree) of the participants' agreement with the suggested Pre-Delphi Round 2 Framework. The same meta-structure as in the first round was utilised (namely PLANNING; BUILDING; RUNNING; ENABLING; MANAGING).

Findings

In our analysis of the Round 2 panel feedback, a relatively small self-selecting sample (n=10) was used. Our potential application of inferential statistics was therefore limited, and we approached our data analysis fully cognisant of the limits of our deductions. Analysis of the panel feedback was conducted by means of basic descriptive statistics, focusing primarily on analysis of the median as well as measures of dispersion.

In the further analysis of expert panel data as well as the construction of the SOSG Utilisation Framework, we classified the identified competencies into four broad categories:

- *Game Design (GD) Competencies*: Required to ensure player engagement, a Flow experience and the essential integration of elements such as storyline, challenges, reward and user interface.

- *Learning Design (LD) Competencies:* Required to ensure that clear learning goals are set, met and validly assessed.

- *Generic Managerial (GM) Competencies:* Required to ensure that best practices are adhered to in terms of delivery of implementation projects on time and within budget.

- *Subject Matter (SM) Specific Competencies:* Required to ensure that expert thinking is applied to complex, domain specific problems.

For statistical analysis we further categorised respondents into two groups based on their dominant area of expertise*: Serious Games* (SG; n=6) and *Leadership Development* (LD; n=4). The

Central Tendency Criteria for identifying Support of Competency was set as Median > 4. The criteria for identifying a Critical Competency was set at Median > 4.5. (See Figure 1)

Our panel of experts presented support for the existing e-CF 2.0 competencies as well as our new competencies. The competency categories suggested, namely LD, GD, GM and SM were also well supported.

	Median Existing Rating	Supported? >4	Critical? >4.5
LEARNING DESIGN COMPETENCIES	4.50		
LEADERSHIP DEVELOPMENT GROUP	5	Yes	Yes
SERIOUS GAMING GROUP	4	Yes	No
GAME DESIGN COMPETENCIES	4.75		
LEADERSHIP DEVELOPMENT GROUP	4.5	Yes	Yes
SERIOUS GAMING GROUP	5	Yes	Yes
GENERAL MANAGERIAL COMPETENCIES	4.00		
LEADERSHIP DEVELOPMENT GROUP	4	Yes	No
SERIOUS GAMING GROUP	4	Yes	No
SUBJECT MATTER EXPERTISE	4.50		
LEADERSHIP DEVELOPMENT GROUP	4.75	Yes	Yes
SERIOUS GAMING GROUP	4.25	Yes	No

Figure 1: Panel Support per Competency Category

The following Critical Competency categories have been identified by the Leadership Development (LD) group:

- Game Design
- Subject Matter Expertise
- Learning Design

The following Critical Competency category has been identified by the Serious Gaming (SG) group:

- Game Design

Significant differences were observed in the opinions of the SG and LD groups of experts on both NEW and EXISTING competencies. There is for example a clear disconnect in the perceived importance that the LD and SG groups attach to the Learning Design and Subject Matter Expertise competencies as critical to SOSG implementations.

These findings suggest a potential disconnect between the two groups of role-players (LD and SG) that are typically involved in SOSG implementations. Cross-training may be beneficial to the SOSG implementation success.

It is our opinion, based on the literature, that each of the competency categories (GM, GD, SM and LD) needs to be present within implementation teams to ensure successful SOSG utilisation.

When analysing the question whether a rating and weighting of more critical competencies can be suggested, the Delphi panel feedback was evaluated per e-CF 2.0 process steps.

Planning

In terms of the Planning process of SOSG projects, the critical competencies identified by both SG and LD groups were Business Plan Development, Product or Project Planning, Instructional Design, Serious Game Design, Assessment Design and Subject Matter Expertise (specifically Leadership Development expertise).

 A competency where a seemingly big disconnect was presented between the SG and LD groups, was Sustainable Development. It is also interesting that neither of the groups particularly valued the technique and competency of Rapid Protyping's potential within SOSG planning.

It is furthermore interesting to note that none of the groups viewed Technology Watching as a critical competency within the planning phase. This may present the positive deduction that both groups are sensitive to relying too heavily on over-hyped new technologies. The other possible deduction is that both groups are not particularly focused on remaining at the cutting edge of technical solutions, which may present a negative longer term impact if technology that becomes obsolete very quickly, is implemented. There is not enough data available for us to make a definite finding in this regard and it is suggested that this difference between the groups is studied in further detail.

Building

Both SG and LD groups viewed Game Design and Development, Documentation Production, Assessment Construction, and Leadership Development Subject Matter Expertise as critical competencies. The SG group valued Systems Integration and Solution Deployment more than the LD group. This we speculate may be a factor of their typically better experience in dealing with IT-related projects and its systemic integration challenges. The LD group may be less directly experienced in dealing with this issue. It may also present an area where cross-training between project team members may benefit SOSG project implementation success.

The SG group seems to value Experiential Learning Subject Matter Expertise more than the LD group. It may be that SG group members have a higher realisation of the fact that Experiential Learning can be viewed as a distinct field of expertise within Leadership Development. It would be interesting to compare in future research the amount of time and attention given to Experiential Learning within the personal education and training of the typical LD group with that of the SG group. It may very well be that typical SG group education and training put significantly more emphasis on Experiential Learning versus other learning and development approaches.

Running

Both SG and LD groups viewed User Support, Change Support, Service Delivery, Project Control Skills and Quality Control Skills as critical competencies. The SG group valued Project Control Skills more than the LD group. The SG group also valued Facilitation Skills more than the LD group. It is interesting that the SG group seems to support the notion that facilitators have a critical role to play even though the project focus is on online gaming.

Enabling

Both SG and LD groups viewed Personnel Development as critical competency. It is interesting that neither group seemed to value Information Security Strategy Development. It is furthermore of interest that neither group were viewing the Purchasing and Contract Management competencies as critical. This could be explained by the fact that, within corporate structures, these functions may typically be dealt with by a separate Finance/Procurement Department. It may however present a risk factor to successful utilisation of SOSG in Leadership Development if the imple-

mentation team is not also actively aware of the terms and conditions of procurement and service level agreements relevant to the project.

Managing

Both SG and LD groups viewed Continued Assessment of Validity as critical competency. It is interesting that the LD group did not seem to view the Managing competencies as critical. This is a rather surprising finding because in most implementations one would expect the LD group to take the lead in actively managing SOSG projects. It may also be indicative of a perception that the SG group (typically as developers and architects of SOSG) is also responsible for managing its success. In a number of SOSG implementation projects the SG group will consist mainly of outsourced specialists (most organisations, excluding the big corporate organisations such as IBM, do not yet have large in-house SG capacity). It is therefore a significant risk factor for successful SOSG utilisation if the LD group (typically consisting of in-house resources) shifts the responsibility for managing projects to the outsourced SG group.

Discussion and Recommendations

The primary research question ascertained the competencies (knowledge, attitudes and skills) necessary for organisations to successfully utilise Social Online Simulation Games as Leadership Development tool. In this regard, we suggested these competencies to be a combination of Game Design, Learning Design, General Managerial and Subject Matter Expertise competencies.

In terms of the sub-questions investigated, it became clear to us that the current technology utilisation frameworks and/or models in literature do not provide an adequate typology of required competencies. These frameworks typically do not take into account the specialised skills (such as Game Design and Learning Design competencies) required for successful SOSG utilisation. Although most of the existing E-CF 2.0 competencies were well supported by panel consensus, various additional competencies were identified as being required for Social Online Simulation Games usage.

Although we were constrained by small sample size and a self-selected sample, we were able to identify an initial rating and weighting of more critical competencies suggested in a form of a framework. We also integrated our findings into an SOSG Framework that can be further tested and refined in practice. Methodologically, a substantially larger expert panel may offer various opportunities for refining the framework and testing the robustness of its basic tenets and structure.

This type of framework may become increasingly valuable to practitioners as easy to use *game authoring tools* proliferate. It is expected that more and more of these tools will become available and SOSG applications will potentially be developed by *Leadership Development* experts rather than *Serious Games* experts.

The analysis suggests that the proposed SOSG Utilisation Framework might form a relatively robust basis for further refinement of the competencies required to implement SOSG in Leadership Development applications.

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Biography

Wouter Grové is the CEO of Gamechangers Pty Ltd, a serious gaming and gamification consultancy based in Cape Town. He is program manager: Digital Learning for Leaders, School for Public Leadership, University of Stellenbosch and Project manager: WC CoLab for eInclusion and Social Innovation situated at University of the Western Cape. Wouter is interested in the intersection of the trends of ubiquitous gaming, ubiquitous computing and social networks. His current research focuses on engagement in open innovation projects.