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Simulation Gaming for Youth Care Knowledge Construction

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Abstract *Youth care multi-disciplinary exchange needs flexible, interactive and attractive tools and methods to enhance timely, effective and durable help in complex parenting problem situations. Social media, virtuality, simulation and gaming gain an ever increasing significance in the way people share information, learn and organize themselves. This leads to the question whether youth care practice may adopt online practicalities, such as online simulation gaming, for network exchange. The research objective is to find out if complex multi-problem situations can be represented in game models and to know what youth care professionals think of its relevance, usability and usefulness for network exchange. In a multiple case research strategy, model development and model appreciation of online role-play simulation gaming has been studied as a time, pace and place independent way to share expertise, information and knowledge among actors in youth care networks. The results show that youth care professionals think that simulation gaming is relevant and convenient to unravel difficult issues, to elaborate network strategies, and to jointly reflect on intervention. Online role-play simulation gaming leads to a better understanding of complexity in youth care situations, to a greater awareness of network capacities and capabilities and helps to establish accountability of choices of intervention.*

Keywords: *youth care network collaboration, systems complexity, social problem solving, role-play simulation gaming, knowledge exchange, knowledge construction*

Simulation Gaming for Youth Care Network Exchange

Youth care in the Netherlands is in need of flexible, interactive and attractive tools and methods for knowledge exchange for timely, effective and durable help in complex parenting problem situations. The demand for help exceeds the capacity of youth care services. We need to find new ways to enhance the efficacy of help. Moreover, we want to restore responsibility in families and social networks as much as possible, and to avoid taking over too much of the parenting tasks. This puts claims on the transformation of youth care services. Youth care needs to focus on collaborative social learning and on network tools that support the cooperation and coordination of everyone involved in the healthy development of children and families (Van Yperen, Van Woudenberg, 2011).

Social media, virtuality, simulation and gaming are becoming increasingly important for the way people share information, learn and organize themselves. Knowledge intense practices of youth care do not yet seem to take much advantage of these developments. A recent research and development project shows that youth care practice can benefit from online simulation gaming, as a new tool and method for network exchange and knowledge construction (Van Haaster, 2014)[1]. To provide insight in the starting points for this paper, we quote a prioritized set of results from the referred research.

1. Practice workers endorse the idea that online simulation gaming can be an effective, additional tool to advance really difficult multi-problem, multi-actor and multi-reality situations[2];
2. It is possible to model youth care problem issues in game design, following criteria and conditions that apply to work conditions of youth care network exchange. The elaboration of artifacts requires close cooperation with experts from the field of application;

[1] In order to get a complete picture of the methodology and the theoretical and empirical framework, it is recommendable to read the full publication about the research at www.uvh.nl/english/research/publications

[2] Multi-problem cases go beyond the practice-as-usual situations. Those cases are wicked and tricky because of dissension among the parties involved about norms and values, and deal with varying loyalties and perspectives.

3. The intended users (youth care professionals) proclaim that the tool, environment and method are adequate to unravel difficult issues from practice and to jointly reflect on choices of strategy and intervention;

4. Youth care workers affirm the following advantages of online simulation gaming:

   a. Role-play and anonymous participation encourage perspective change and the shift of ideas about situations, problems and possibilities;

   b. The time, pace and place independent sharing of expertise, information and knowledge among actors in online sessions[3] affords time to think thoroughly about interactions and contributions;

   c. The method includes careful analysis and deep collaborative reflection about session performance in view of progress in practice situations;

   d. The session outcomes, both experiential and factual, build a solid ground for reflective dialogues about the transfer of knowledge to practice.

5. The research & development project yielded an apprehensive set of design requirements and an implementation method, suitable for youth care practice;

6. Online simulation gaming can be a method of concerted practice research to study complexity in problem situations and to scrutinize network strategies. Joint evaluations of processes and performances in practice and game sessions are key elements in the proposed approach;

7. The research and development of network exchange is unique in the fields of youth care intervention and game theory. The singularity of contexts and actors is taken as the frame of reference for learning, change and development, in a cross-over of game design and behavioral sciences;

8. The tool and method need further elaboration toward the practical requirements of youth care practices;

9. The theory of online simulation gaming in youth care networks asks for advancement through implementation and analysis of results, in accordance with the standards, needs and aspirations of youth care services.

[3] A game session is the actual effectuation of a game.

The above referred research describes an adventurous exploration of the value and significance of online simulation gaming to support knowledge exchange in multi-disciplinary networks of youth care. Child, youth and family care workers are often confronted with complex problems, which they try to disentangle in favor of small and simple steps forward. In systems theory, complexity and simplicity are closely related. Simple systems can generate complex forms and the question is whether complexity can be brought back to simplicity. The complexity of youth care problems tends to increase in proportion to the diversification and interdependence of systems elements. The idea in this research is that simple interfaces, such as online role-play simulation gaming, may improve the accessibility of complexity in problem situations. To design good representations of complex problems, we have to unravel their elements.

Understanding the complexity in youth care problem situations is the 1st platform of learning when designing online role-play simulation games. Role-play demands a high awareness of relationships and interaction patterns. Discourse participation is the 2nd level of learning. Games strengthen the imagination, participation and commitment to change. The 3rd level of learning is performance and entails a good comprehension of the interconnectedness of the worlds of practice (understanding complexity), game play (discourse participation) and future progress (the commitment to situational advancement).

Prospects of Simulation Gaming

Online simulation gaming is presented as an extra tool and method in youth care networks to find and justify strategies of intervention that may change problem situations into states that are more desirable or at least more acceptable for the parties involved. Online simulation gaming is no cure to all sorts of issues; however, it can be a way to change perspectives and to shake up jammed positions, assuming that this leads to richer views on the potentials in networks and situations. The research content addresses a wide variety of audience and the knowledge domains of youth care intervention and game theory may seem difficult to harmonize. This can be problematic when analyzing performance and composing theories. Another problem is that digitalization in social

intervention practices holds such a marginal position. Computerization in social care services usually refers to less popular 'paperwork' for client registration. Social workers may find it difficult to associate role-play simulation gaming to collaborative critical thinking and the preparation of intervention. However, since social media take such a central place in society, it is conceivable that the use of online simulation gaming for knowledge exchange may contribute to save time and to work more efficiently. Apart from the obvious practical reasons of time, pace and place independent participation, online simulation games may engage youth care workers in attractive and fast ways of deep reflection on complex issues. The referred research is a first step in directions that introduce online simulation gaming in youth care work practices. It describes a qualitative design research about model development and the appreciation of online simulation gaming for knowledge circulation about complex parenting and child rearing situations.

The online game interaction, as employed in this research[i], involves the study of problem situations, network possibilities and reflection on strategies and interventions. A real world youth care issue with its actors and objectives, is taken as a resource for the design of the game concept and artifacts. The participants of the game are assigned to roles, which may differ from roles in their normal life. They engage in realistic interaction to find solutions and to enhance the family and pedagogic conditions. The research has a central, design-based and problem-solving proposition that online simulation gaming contributes to the renewal of methods and instruments of youth care network exchange. The game envisages a meticulous exploration of the problem situation, the preparation of strategies and the reflection on choices and approaches of social intervention. The method and tool may provide teams and network partners with a compressed and powerful impetus to participation and commitment in really difficult cases. The research challenge was to find out what youth care professionals think of these alleged potentials of online knowledge exchange in simulation games. Would they consider online simulation gaming an appropriate, usable and useful tool for network deliberations?

The Research Context

Virtuality, mixed reality experiences and adaptation play a major part in working and learning in modern society. It appears that the game-based approach and perspective change in online simulation games strongly appeal to collaborative knowledge construction and strategy creation (Warmelink & Mayer, 2009). The narrative and metaphorical impact of jointly developed stories and scenarios in online simulation games can lead to the discovery of ways out of deadlock situations and to new behavior. This assertion seemed relevant for youth care practices and led to the question whether online simulation gaming could be an relevant, useful and utile extension to the repertoire of methods and instruments for network exchange about multi-problem, multi-actor and multi-reality situations. The multiple biases of clients and workers require to emphasize and deal with varieties of interests, positions and perspectives in problem situations. As perspective change is a purposeful option in online role-play simulation gaming, our assumption was that this way of exchange and learning could be conducive to gain new experiences and insights.

The quality of network exchange among youth care workers is vital for successful intervention. Network consultation is a self-regulating, interactive thinking and reasoning process. Studying the exchange may lead to a better comprehension of the professional rationality of reflection-in/on-action. Positive cooperation and effective coordination depend on how strategic strengths and network competences are used, stimulated and improved. Despite these affirmative claims, only little research has been done on processes of youth care network exchange. We simply do not know precisely how network actors share and explore situational information and how they coordinate their interventions, or how they justify their actions. The lack of practice-based insight may lead to different problems. Without a reasonable understanding of the nature and content of network exchange, it is hard to reflect on the relation between systems elements and intervention in problem situations and constellations of cooperation. It is very difficult to guide the enhancement of network competences and strategies, if we do not know what the active substances are of effective network interaction. Deploying online simulation games supports the study of network performance, provided that we are able to construct

valid systems representations of problem situations (*model development*) and that we can realize active participation of all parties involved (*model appreciation*). The research outcome shows that it is possible to model youth care knowledge exchange processes in online simulation games and that the analysis of outcomes leads to understanding network processes and performances.

The Research Design

In a multiple case study, a broad range of practice experts played roles in a series of sessions and worked out future scenarios, strategy agreements and normative frameworks for intervention, based on a complex deadlock situation from practice. The session actors gave their substantiated opinions in reflective dialogues and questionnaires about the perceived value and significance of online simulation gaming for network exchange. The research aimed at design and utility, which implied the study of design requirements and implementation conditions and entailed the examination of user-experiences and views as to online simulation gaming for network exchange. The main research question was formulated as follows:

What are the design and implementation requirements of online simulation gaming for youth care network exchange and how do youth care professionals value online simulation gaming for network deliberation about complex problem situations?

The empirical research questions concerned the content and conceptual design criteria, as well as the experiences and opinions of youth care network partners about the functionality of the model and the environment. The respondents stated that online simulation games can help to understand, predict and analyze behavior and effects in youth care problem situations. Youth care professionals believe that online simulation gaming can be beneficial for knowledge exchange in multidisciplinary networks. On the other hand, they foresee practical obstructions to the implementation. Youth care practices impose particular demands on the design, the effectuation and moderation and the evaluation and transfer of results to practices. Their critical considerations about gaming in practice concern the process accompaniment and the technical and organizational support. The theoretical significance of the research

is the contribution to the body of knowledge of youth care network exchange and of game design and game theory. The scientific validation of this assertion asks for subsequent effect research.

We may distinguish two strands of research in this project. The first regards *model development* and the question, whether it is possible to effectively represent systems elements of complex youth care problem situations in the design of virtual artefacts and role-playing simulation games. The second strand concerns *model appreciation* by youth care professionals, referring to online simulation gaming for the enhancement of the effectiveness and efficiency of network exchange. Besides literature search and practice inquiries about youth care knowledge exchange and game theory, various trial runs and tests simulations were carried out in organizations, as a preparation to the game design. The main research data came from a series of online simulation games in a multiple case strategy. We applied a balanced interchange between positions of practitioners and observers (Klabbers, 2009) as a key-element in the method of online simulation gaming for youth care knowledge exchange. We may conclude with the assertion that online simulation gaming can be employed to compare and study systems characteristics from practice (*practice world*) with patterns of systems relations in virtual network exchange (*game world*), in view of dialogues about probable, possible and preferable systems development (*future world*).

The Conceptual Foundation

The conceptual research groundwork links theoretical concepts of role-play simulation gaming to narrative and scenario-developing characteristics of youth care. We related the exchange needs of youth care practices to a certain class of games, *principles-based games*, to guarantee openness and enough discretional opportunities for a free flow of exchange. We found out that network exchange comes down to sharing situational information, mutual reflection and joint strategy development and accountable decisions about intervention. We framed these network functions as *informing*, *reflecting* and *decision making*. From field explorations and literature search three conceptual themes emerged, which have been used to compose a theory on online simulation gaming for network sharing in youth care practices. The

three themes were validated by the respondents as overarching content areas of knowledge exchange. The 1st theme is called *situational knowledge* and covers facts, the detection of missing bits of information, perceptions, interpretations, and all attempts to achieve the best possible understanding of what is at stake in the problem situation. The 2nd subject concerns *discourse participation* and includes the search for the best possible strategies for optimum commitment and performance by all network and situational actors. The 3rd and last theme is about *normative reflection* on situational values, as well as on shared and conflicted interests and positions, relationships of power and dependency and on human dignity and autonomy. Youth care intervention can deeply affect the lives of children and families. Care workers need to carefully consider and discuss their ethical and normative standards in view of the accountability of choices of intervention and strategy. Online simulation gaming enables to meet this special requirement of youth care network practice.

Besides an inventory of network behavior and conceptual themes, the practice inquiries led also to an outline of prospects and expectations of youth care professionals about online simulation gaming for network exchange. Online simulation gaming is an intense form of interaction and exchange and practice workers think that its use is appropriate for the exploration of complex problems and dilemmas. These are issues that cannot be resolved easily with everyday tools and resources and that ask for an 'extended mind', involving other experts and different interaction methods. Online simulation gaming basically offers an unlimited expansion of knowledge and experience to investigate complicated cases time, pace and place independently. The tool and method can also be used for job training and to test patterns of knowledge-to-action and action-to-knowledge. In practice the enhancement of professional skills and attitudes is challenging and not easy. Yet, the 'corporate knowledge and skills' are considered as the key to successful networks and teams. A better understanding of the professional rationality may support the improvement of network skills and corporate learning.

The fundamentals of design were developed from the outcomes of practice inquiries and from seven online simulation games that were tested in curricular programs for the training of social professionals. These games afforded to test the theory of

Klabbers (2009) about the relation of game model (design-in-the-small) and program objectives (design-in-the-large). Our choice to emphasize the mutual dependency of program and model had to do with the research questions and is linked to Hevner's theory (2004) about the position of design science between practice requirements (*model development*) and scientific rigor (*model appreciation*). Our design approach is related to the design research framework of March & Smith (1995). We adapted their scheme of design activities and design outputs by adding a dimension of categories for design analysis. This resulted in the construction of an analysis tool to structure the data flow from sessions of online simulation games. The analysis tool helped to map session outcomes to the conceptual themes of *situational cognition*; *discourse participation*; *reflection on intervention* and to the action fields of *investigating the situation*; *strengthening the network* and *justifying the choices of intervention*.

The Empirical Framework

Model development (game design and artifacts construction) was achieved with feedback from staff of three large youth care organizations and one institute of higher education. Model appreciation (effectuation and evaluation) was examined through the opinions and experiences of youth care professionals, who took part voluntarily and for own account and responsibility. We applied a multiple case strategy to suit the situational complexity of youth care and to compare in-game behavior and interaction in different sessions. We asked a group of observers (experts from practice, research and education) to supervise the design and effectuation of research and to provide feedback on the design, method and results. The game was elaborated in 4 variants, effected in 10 sessions with the participation of 55 youth care professionals. A step-by-step approach helped to improve the game on the basis of intermediate results from three rounds of effectuation and the feedback from the observing experts. In accordance with the research questions, the game model has been assessed on three levels:

1. the relevance for the collaborative study of complex practice problems (case level);
2. the usability in youth care networks (session level) and

3. the usefulness for personal network effectiveness (task level).

As a method, we applied a 3 level structure of configuration, construction and evaluation, in which practice and observation took turns. The 1st level was dedicated to the design of the game model and artifacts. The 2nd level was about the construction of the game and the effectuation in sessions. To gain a better impression of the respondents' views on the practical possibilities of this tool and method in their own professional practices, we presented a questionnaire at the end of each session. On the 3rd level, the actors were engaged in reflective dialogues on processes and results and on the perceived value and significance of online simulation gaming for youth care practices. The actors shared their opinion, not only about the tangible products of future scenarios, network agreements and normative frameworks in this problem case; however, also gave their substantiated opinions about the relevance, usability and utility of the tool and method. The results from the reflective dialogues have been compared with the outcome of an analysis of session data. This supported our interpretation and understanding of the statements of the participants in the reflective dialogues .

Results, Conclusion, and Discussion

The teams of session actors produced many serious options for intervention and change in the problem situation that was given at the start of the game. The practitioners and observers confirmed that the game model leads to a meaningful exchange. The session output of future scenarios and strategy agreements is interesting, though not the prime focus of research. We aimed at finding out whether model representation of a youth care problem situation would be possible in a simulation game and what the contextual design and implementation requirements for online simulation gaming would be. The second part of research was directed towards analyzing the users' appreciation of online simulation gaming for knowledge sharing. The results show that youth care professionals believe in the potentials of online simulation gaming for network exchange. They affirm that the method and tools are relevant, usable and useful for the study of complex issues from

practice. On the other hand, they foresee that the design, effectuation and evaluation asks a lot of time and a strong commitment to change and learning. It remains unsure, whether youth care professionals and organizations in general are prepared to invest time and energy in the implementation and advancement of online methods and tools for network exchange. In this regard, the session participants might be different from the average youth care professional. They may have shown a higher level of interest in innovation and in the use of social and digital media for network exchange and for the improvement of personal skills. This, however, has not been proven.

The 1st field of results shows that online simulation gaming is relevant for network sharing. We have found that intricate youth care problems can be the starting point for a systemic representation in artifacts and that it is worthwhile to address complexity through online simulation gaming. The 2nd field of results is about the strengthening of discourses, participation and skills that are vital for adequate network operation. The game contributed considerably to the commitment and strategic engagement of all actors. They perceived an increase of discipline knowledge and a progress of skills of effective network interaction. At the same time, it became clear that the participants had difficulties with the discernment and strategic utilization of the practicalities and specificities of the network and problem situation. Tactical handling of potentials and coping with restraints and limitations in situations and networks can be trained and online simulation gaming offers a convenient arena for this. The 3rd field of results concerns the usefulness of the online method and tools for the development of competences, talents and network abilities. The actors appreciated the concept of anonymous role-play for perspective change and for the training of new attitudes, tactics and communication. They consider online simulation gaming as a meaningful resource for networking and workplace learning.

The respondents pointed at thresholds to the implementation of online simulation gaming in organizations. Although a majority is positive about the prospects, it is noted that current work practices are inadequately equipped with the necessary means for online exchange. Network practices are not prepared to use digital tools and methods. It is clear that organizations and networks need to develop game expertise in view

of a successful integration in work practices. If we are concerned with effective network exchange and intervention, it seems obvious to team up with research institutes and game design specialists to fill the gap. The respondents stated also the necessity to improve the application, tools and technics to the specific needs of youth care network exchange.

Youth care needs appropriate, attractive and timesaving tools and methods to track down and engage the right expertise, also from outside the realms of knowledge and experience in local teams and networks. The youth care work dynamics require that organizations, networks and professionals incessantly build new alliances and the increasing demand for help asks to grasp all chances to enhance effectiveness and efficiency of youth care services. Studying processes of inter-thinking and joint reasoning about complex problems may lead to a better comprehension of the sagacity of social professionals and networks and reinforces intervention theory.

Some Critical Considerations

Youth care practices rely heavily on face-to-face contact. Digitalization of the work meets with skepticism. Technology is not the prime focus of attention in social intervention. Is it possible to convince youth care organizations that the individualized approaches of computer mediated communication help to understand network exchange and to assess learning? We know that simulation gaming fits in with learning theories such as experiential learning, situated learning, transactional learning (Gibson, Aldrich et al., 2007; Maharg, Nicol, 2009; Crookall, Thorngate, 2009; Van Haaster, 2009; Ferguson, 2011; De Caluwé, Geurts, Stoppelenburg, 2012). However, these theories have not yet been tested in the context of social services. The cyclic iteration of experience, reflection and conceptualization (Kolb, 1984) parallels the functions of informing, reflecting and decision making, which are fundamental to youth care network deliberation. And yet, despite the promising projections, online simulation gaming is no solution to social problem-solving in all contexts. We are not yet certain in which situations simulation gaming is effective for problem solving and intervention.

We still lack practice-based evidence with online simulation gaming in social work contexts. In many publications, researchers content that it is difficult to indicate the active substances of success with simulation gaming (Mayer & Mastik, 2007; Hofstede, De Caluwé, & Peters, 2010). The complicated interdependence of context, method and tool can be different in each situation and for every problem, which makes it hard to posit valid statements about cause-effect correlations. Assessment studies require a joint approach, in which youth care knowledge and effect research are related to specific game design theories. Although this interdisciplinary approach to knowledge may be a regular research practice in fields of learning, management and policy, in youth care and social intervention this type of research remains to be done.

Probably the most important counterargument is that it can be hard to find the right strategy to guide implementation to success. We need to combine expertise of gaming and social problem solution in a consistent way. Youth care practices are dynamic and capricious. What may be the impact of the unstable conditions of youth care problem situations to knowledge exchange in simulation games? Another point is that youth care workers may find difficulties in working with the tool and method. Is it possible to stay close to prevailing professional standards and methods, and to build experience, confidence and trust in this new way of exchange? And last but not least, there is the problem to find time and energy to experiment. Youth care practices are subject to high pressures. How can we integrate online simulation gaming in daily work routines, in such a way that we immediately gain time and achieve quicker and better help?

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[i] The application used is Cyberdam. Please see games.cyberdam.nl and www.cyberdam.nl. The tool is a virtual learning environment for online role-playing games, in the context of a 2D virtual city. Cyberdam has been developed in cooperative partnerships of institutions of higher education in order to develop simulation gaming for training and problem-solving (Warmelink & Mayer, 2009). The environment is based upon open source software. The tool and method has been developed and tested for use in youth care professional networks (Van Haaster, 2014).