Articulation of tacit and complex knowledge

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ABSTRACT
The paper focuses on the articulation of tacit and complex knowledge by taking outset in a specific methodology: LEGO® SERIOUS PLAY™. In order to expand the methodology and to develop it further we propose to regard it as a language. By choosing a language view we are able to ably a language training perspective and to explore the possibilities for developing the methodology hereby. Though the paper is explorative in nature it demonstrates that the language approach to the methodology points to relevant improvements and furthermore invites to new types of research involvement.

Introduction
One particular problem in handling complex knowledge and complex problems is the articulation (Snowdon, 2007). In many cases we restrict ourselves to the spoken language as a means to articulation. However, the spoken language has a large number of limitations and efficient communication therefore needs various supplements to ensure both richness and nuances in articulation and in perception.

In most cases the spoken language is supplemented with illustrations and non-verbal communication (body language, voice tone, facial expression, etc.). Psychological studies have revealed that the neutral spoken words count for less than 10% of the perception (Mehrabian, 1967). Even though the setup of such studies is frequently disputed it is generally accepted that the impact of the neutral spoken word is much less than the contextual and supporting factors.

The practical applications developing from the psychology sciences emerge slowly due to the mainly inductive nature of these scientific fields (Fox et.al. 2009). Therefore, the development of emergent approaches often comes from multiple practices related sources. Many of these approaches include elements of play because the psychological state of people in play is largely open-minded and thereby more receptive to both learning and perception.

The developments of such emergent approaches are mainly based on trial-and-error principles. This might be the only efficient approach and it often leads to powerful stand-alone applications. However, due to the practice related nature of the development process the different applications often end up as stand-alone applications. There might be potential to develop them further but the missing insights into the fundamental principles behind the applications impede this.

In this paper we discuss these limitations and take outset in one particular and comprehensive methodology: LEGO® SERIOUS PLAY™ (LSP). We choose the approach to explore LSP as a language in parallel with viewing it as a methodology. This approach enables us to consider how we can train people in using the language and to consider where the language might be more or less efficient. Furthermore, we need to explore how we can stimulate a progression in people’s ability to use the language and to evaluate how the language might be integrated with other methods or languages. By exploring the language approach to LSP we expect to identify nuances
of the language that potentially can be trained in a progressive way and by doing this better match specific predefined purposes.

An important intention is to reveal structural elements of LSP that inspires to further research and involvement of research institutions. That can language wise be framed as knowing more about the specific syntax and semantics of LSP.

**LEGO SERIOUS PLAY as a methodology**

The initial development of LEGO SERIOUS PLAY (LSP) was initiated by the president and owner of LEGO Company, Kjeld Kirk Kristiansen, 3rd generation in the Danish family owned company. He was dissatisfied with the results of his strategy-making sessions with his staff and he had the experience that while the business of LEGO was about imagination, the results from the strategy-making sessions were decidedly unimaginative.

LEGO created a separate subsidiary named Executive Discovery based on the seemingly simple idea to use building with LEGO bricks as means for tapping into unconscious knowledge and to communicate this knowledge in narratives.

The development of the LSP concept has since been an ongoing process. Most effort has been devoted to develop applications to facilitate strategy-making.

In practice, LSP is a facilitated workshop, where participants are asked different questions in relation to an ongoing project, task or strategy. The participants answer these questions by building symbolic and metaphorical models of their insights in LEGO bricks and present these to each other. An essential part of the LSP workshop is the non-judgemental, free-thinking and somehow playful interaction between the participants (Gauntlett, 2007). In figure 1 is shown a typical model from a LSP workshop.

![Figure 1: A typical model from a LEGO Serious Play workshop](image)

The LSP process has four central elements that build on the hands and brain interplay:

- Construct
- Give meaning
- Make the story
- Reflection

These four elements can to a degree be observed as the structuring principles of an LSP process, and may therefore be observed as the syntax of LSP process when viewed as a language. Adding underlying principles such as that the “answer is in the
system” and “the builder owns the (interpretation of the) model” adds to this. It is the learning of this syntax in the so-called skills building phase of a workshop that this paper is aiming at be more conscious and precise about.

In a specific workshop the participants are initially asked to build their perception of the defined problem. The dogma of the process is ‘Start building’. As the spontaneous building process progresses the participants give meaning to the models by tapping into their brains. After the individual building assignment each person is given time to explain his or her perception of the problem at hand by taking outset in the physical model. Other participants will ask about details but will respect the model and the meaning that the individual builder attaches to it. This last part is the reflection part which provides insight both for the individual and the team.

When each of the participants has told their stories the whole team build a shared model based on elements from and additions to the individual models. The shared model can then be challenged according to the overall purpose of the workshop.

The elements of LSP are rather generic and have been used for a broad range of purposes, including:

- Strategy development, communication, and exploration.
- Strategic relations to market segments or partners
- Organizational development
- Innovation and product development
- Change management processes
- Scenario development and testing
- Mergers and acquisitions
- Branding
- Leadership and team development
- Turnaround and restructuring
- Market entry
- Competitive analysis
- Value chain analysis
- Many specific application within social sciences

The applications exist in many variations and both the variations and the nuances to applications are driven and developed by private consultants.

**Background and status of LEGO SERIOUS PLAY**

The essence of LSP is building on the complex interplay between the hands and the brain (Wilson, 1998). In neural sciences this interplay has been communicated in a more popular way by a grotesquely disfigured human body named ‘Homunculus’ (see figure 2).

Homunculus is a physical representation of the portion of the human brain that is responsible for exchange of sensory information from the different parts of the body (Jensen, 2005). The resulting image is a grotesquely disfigured human with disproportionately huge hands (and fingertips in particular), lips, and face in comparison to the rest of the body. Because of the fine motor skills and sense nerves found in these particular parts of the body they are represented as being larger on the homunculus. A part of the body with fewer sensory and/or motor connections to the brain is represented to appear smaller.

Though the homunculus is a gross oversimplification of the human neural system it is useful in order to understand why the process of building and engaging with our hands and fingers stimulate our brain and thereby our imagination.
Figure 2: Homunculus – This representation from The Natural Historic Museum in London

Many contributions and ideas from the fields of psychology and behavioral science support these experiences and empirically documented observations. Our research has drawn particularly from two ideas:

- **Constructivism** – a theory of knowledge developed by Jean Piaget, his colleagues and his institute in Geneva, Switzerland.
- **Constructionism** – a theory of learning developed by Seymond Papert and his colleagues at MIT in Cambridge Massachusetts, USA

Piaget discovered that children are not just passive absorbers of experience and information, but active theory builders. Children are not just empty vessels into which we can pour knowledge. Rather, they are theory builders who can construct and rearrange knowledge based on their experiences in the world. His theory of knowledge, stipulating that knowledge is built or constructed by the child is known as constructivism (Piaget, 1951).

Seymond Papert was a colleague of Piaget and wanted to extend the theory of constructivism to the fields of learning. Papert eventually called his theory constructionism. It included everything associated with Piaget’s constructivism, but went beyond it to assert that constructivist learning happens especially well when people are engaged in constructing something external to themselves.

Papert also developed his own and Piaget’s ideas to cover not only children learning. It applies to adults as well. Constructionism is a way of making formal, abstract ideas and relationships more concrete, more visual, more tangible, more manipulative, and therefore more readily understandable. At the core of both ideas is the notion that when we “think with objects” or “think through our fingers” we unleash creative energies, modes of thought, and ways of seeing what most adults have forgotten they even possessed (Papert, 1996).

Following Papert’s ideas on “thinking with object” LSP can be seen as a neutral language that facilitates the articulation of complex and tacit knowledge. In this sense the bricks could be replaced by yellow notes or even a blank sheet of paper. The strength that we see in the bricks is that they evoke an emotional feeling in the team. This also point to some of the limitations of using bricks. If the initial problem is specific there might be more suitable neutral languages available (e.g. budgeting).

Another feature supporting Papert’s ideas is the fact that participants are given time to reflect upon a specific problem and by given time to explain their model of the chosen problem to the other participants. Thereby each individual is given time to thoroughly consider all options. Insight involves unconscious processing, switching
from one association, which may be strong but wrong to a new one. It seems that encouraging people to attend to their own thought is helpful for the development of insights (Jung-Beeman et al., 2008). Furthermore, relatively more introvert persons are also given the same conditions as relatively more extrovert persons.

Csíkszentmihályi outlines in his “Flow” theory that people are most happy when they are in a state of flow—a state of concentration or complete absorption with the activity at hand and the situation. The idea of flow is identical to the feeling of being in the zone or in the groove. The flow state is an optimal state of intrinsic motivation, where the person is fully immersed in what he or she is doing. This is a feeling everyone has at times, characterized by a feeling of great freedom, enjoyment, fulfillment, and skill—and during which temporal concerns are typically ignored (Csíkszentmihályi, 1990).

Michal Polanyi distinguished between explicit and tacit knowledge (Polanyi, 1967). Nonaka & Takeuchi (1995) have further contributed to this distinction and have been undertaken some research in how explicit and tacit knowledge is handled in teams. They assume is that knowledge is created and expanded through social interaction between tacit and explicit knowledge. This assumption enables them to postulate four different modes of knowledge conversation: socialization, externalization, internalization, and combination. In particular externalization has been neglected by research. One of the skills building exercises in a LSP workshop is to compare the power of building in three dimensions to communicating in two dimensions. The participants unambiguously report that the three dimensional perspective creates more meaning and is easier to communicate. It is therefore relevant to assume that adding a spatial dimension can facilitate more powerful discursive processes of meaning making and communication.

Howard Gardner (2007) has recently pointed to the area of team creativity as an important field that is been underestimated due to a research bias on the individual. Gardner questions whether our the ideas about creativity need to be refashioned to take into account the increasing number of projects and realms where the individual contribution seems less critical, the group mind more crucial. He points to improvisation as a critical concept in terms of bringing team creativity to the fore. To facilitate improvisation he calls for appropriate methods that support the abilities to come to know individuals quickly, to forge a working relationship and to handle issues of conflict and credit.

Emotions are crucial for helping us make decisions. “From the perspective of the human brain, Homo Sapiens are the most emotional animal of all” “A brain that cannot feel cannot make up its mind” (Lehrer 2009). LSP allows for these emotions to be concrete, to be articulated and challenged. Turning complex arguments into emotionally compelling metaphors also makes it easier to remember them.

In the following we will place the theoretical findings in the context of LSP viewed a language.

**LEGO Serious Play as a language**

Any way of communication can be viewed as a language. Dance is for example a form of nonverbal communication that requires the same underlying faculty in the brain for conceptualization, creativity and memory as does verbal language in speaking and writing. Means of self-expression, both forms have vocabulary (steps and gestures in dance), grammar (rules for putting the vocabulary together) and meaning. Dance, however, assembles (choreographs) these elements in a manner that
more often resembles poetry, with its ambiguity and multiple, symbolic and elusive meanings.

When anyone wants to become better and strives for excellence within a field it becomes essential to learn the syntax and semantics behind this field.

The problems that are addressed in a LSP workshop are important and often critical to the organizations engaged. Therefore a severe trust in the process is necessary. Such trust can be created and enhanced by training the language and by gradually adding nuances to the language. It makes sense to distinguish between a participant in a workshop, a facilitator of a workshop, and a trainer.

Throughout our work with LSP we have gradually developed a still tentative model inspired by the Capability Maturity Model (CMM). The CMM model has been developed to provide (mostly software organizations) organizations with the essential elements for effective process improvement (Humphrey, 1989). In figure 3 is seen the current version of our interpretation of a relevant analogy of the CMM model related to LSP.

At level 1 the process is experienced as chaotic in the sense that there is a no sharp understanding about either input or output. When moving to level 2 a distinction emerge between different elements and aims of the workshop. These elements are treated and understood relative isolated by the participants.

Level 3 is characterized by optimization within the predefined elements as identified at level 2. At level 4 the workshops develop with a high degree of improvising within the predefined element and, finally, at level 5 the workshops can be run with a high degree of improvisation and adaptability according to the goals to be achieved.

Figure 3: A model to explain competence development (inspired by the CMM-model)

The level of a specific workshop will be perceived differently from a facilitator and a participant perspective. Most participants will initially enter the process with a sound scepticism – they don’t know what to expect and they don’t know if the LSP process can bring them more than the numerous different workshops they already have participated in.

Ideally, the facilitator should be trained to a level 4. First time participants will enter at level 1 and through facilitation being guided to level 2. At level 2 the standard
workshop will function, e.g. a strategy exploration process. As the participants gets more confident the workshops will raise to level 3 and the participants will optimise their outcome due to their deeper knowledge about the possibilities with LSP. Only a few participants will reach level 4 and even participants that have reached level 3 will in case of later workshops start on level 2.

In this paper we will focus on the participants and leave the facilitator challenge to later.

Our challenge will be to meet the participants at level 1 – raise them to level 2 and further on to level 3. For participants entering later workshops they will need a short refresh on level 2 and a raise to level 3 on a higher confidence level compared to their first workshop.

Language wise the participants need to learn the basic syntax of the LSP language, to be convinced about the potentials, and to continue with more advanced elements of the language and its applications.

**Skill building and progression in abilities**

The skills building is an integral phase every participant’s first experience of LSP, and something that can be deepened subsequently. Following the language metaphor that we apply in this paper, the skills building is the users’ introduction to the syntax of the language. Upon mastering the elements introduced in the skills building, the participant/user will be able to apply the new language to thematic focus of the workshop. In applying the new language, the context specific semantics will emerge.

The skills building phase follows a carefully designed modular process taking the participants/users through the above mentioned core elements (syntactic structure) of the method (language). The skills building phase is in principle never intended to initiate the discussion of the theme of the workshop, only to establish the language used (LSP). Each participant has an individual box with the necessary bricks for successfully completing the phase.

The different skills building exercises should focus on one or more of the central LSP elements:

- Construct
- Give meaning
- Make the story
- Reflection

Construction is always the natural choice to start with. The participants are asked to build a bridge or a tower with a supplementing requirement to the dimensions. These requirements can be that the bridge or tower has to be as high, as long, or as strong as possible.

The background is to get the participants familiar with the bricks and to learn more about how to connect them. Through the exercise the participants learn that they master the building process, and even though the constructions are very different from participant to participant they always solve the problem (see figure 4).

After finishing the construction the facilitator destroys by purpose a few of the models. Those who have their models destroyed are asked about their immediate feelings when the model was destroyed. They always report an emotional touch when they see their models destroyed. The learning point is that the emotional touch can be interpreted as an emerging ownership to the model that they have spend only a short time on building. The facilitator highlights this sign of ownership and points to the perspective of establishing not only a personal ownership but also a collective ownership when building together.
Figure 4: The Bridge exercise

It is important to start any workshop with a construction exercise and to highlight the ownership aspect. However in order to get a feeling of progression the participants need to experience different exercises and to add more dimensions to the learning points.

Another important initial learning point is the potential very high variety and yet the limited number of different bricks. These aspects can be highlighted in different ways. In figure 5 is illustrated one potential exercise. The participants are picking six specific bricks (illustrated as the six separate bricks in figure 5). At first they are to imagine how these bricks can be build together to become a duck. After a short time they are asked to build a duck.

Figure 5: The duck exercise

As illustrated by figure 5 the six different bricks can be build together to form a duck in various ways. The learning point is that the different ducks build by the participants rarely are the same (even in large groups). Even though the six bricks at first sight seem to have clear limitations the exercise proves a high variety in the outcome. The participants learn that they can express themselves individually with the variety possibilities as provided with the bricks.

In following workshops the exercise can be extended. The team is now divided in two groups. One group gets the bricks and the other group only gets the picture of the six bricks. The two groups are the asked to make as many as possibly different duck in 2 minutes. One group can construct physically and the other group must draw the
different variants. After the 2 minutes the team that were allowed to physically construct the various ducks have made a large number and the team that were only allowed to draw the ducks have made a limited number.

The learning point of this variant of the duck exercise is that the 3D option has a significant impact on our ability to create variety. Secondly, that we often restrict ourselves to communicate in ways that resemble the way that the second team were forces to use.

The former skills building exercises took outset in the construction dimension of LSP. The next central element is “Give meaning”.

This element takes the construction further and adds the activity of giving meaning. The participants start out (individually) on a task which initially comes across as another but more complicated construction exercise (often an animal like construction as illustrated in figure 6). However, as the task seems to be successfully completed the participants are asked to continue by altering their construction so that it becomes a metaphor for an aspect with is well known for them. After the assigned time is up, participants in turn share how their model now is a metaphor for the aspect, e.g. an element of their job.

![Figure 6: An example of a skills building exercise supporting the “Give meaning” element.](image)

This exercise introduces the element of giving meaning to the construction. This is about modelling the most precise depiction of reality, but creating metaphorical exploration of hard to grasp complex issues. Proceeding from this challenge to the subsequent story making challenge, it is also introduced that questions are raised by exploring the construction. This helps to focus discussions, explorations of meaning, to take place with the concrete domain if what is raised: Participant A will explore what Participant B has build (and shared), not what A expects B will say or expected B to say.

The third element is the “Make the story” element.

The participants are now given a bit more time, and more a freer and more open challenge: They are asked to build the extreme version of a well known subject; it could for example be the ideal or nightmare version of a CEO. After end building, the stories are shared and questions are encouraged, if none come the facilitator offers questions in order to establish this practise. In most cases the facilitator has already demonstrated the practise in the metaphor exercise, and then used his own questioning as an example of how-to when introducing the above mentioned rule of “asking questions into the model”.
The final element “Reflection” is used and trained in parallel with each of the former three. The participants do continuously reflect in action about their constructions, their giving meaning to the constructions, and their making stories about the constructions.

**Conclusion and future work**

The LEGO® SERIOUS PLAY™ methodology has proven efficient in handling complex knowledge and complex problems in many different applications. However, as the methodology has matured it has become more difficult to develop it further. In this paper we have demonstrated that by regarding the methodology as a language several new possibilities for further improvements reveals. The effort is still explorative in nature and needs to be consolidated but the work so far has opened for new perspectives that intuitively invites for involvement of various research disciplines different from the original involved. It is expected to be a long term process since various research language differences have to be overcome. The good thing is that the methodology viewed as a neutral language can facilitate such integration between different research disciplines.

**References**


Jensen, E. (2005), “Teaching with the Brain in Mind”, Alexandria, Virginia: Association for Supervision and Curriculum Development


