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LEGO®, SERIOUSLY: THINKING THROUGH BUILDING

ABSTRACT LEGO® Serious Play™ (LSP) is a methodology which has been developed primarily for use in business contexts, initially with *Real-Time Identity for You*, *Real-Time Strategy for the Team* and *Real-Time Strategy for the Enterprise*. However, many of the principles which underpin the methodology are supported within the educational research literature. The findings discussed here represent some of the efforts in reclaiming LSP for the educational domain. The current study introduces LSP as a method of getting at participants' understanding of their own professional identities. It details the process of the development of workshops and reflects on the aspects of 'What Works' within and across a small number of educational contexts. Results from two distinct groups are discussed, pre-service Teachers and Employees in a Small / Medium Enterprise (SME).

Keywords: LEGO SERIOUS PLAY, Education, Assessment, Research Methods

Introduction

LEGO® Serious Play™ (LSP) is well established as a business technique, it has been used widely in a number of commercial contexts such as telecoms and banking. However, although the basis of LSP is supported by many educational theories and practices, it has as yet seen little application in educational contexts. In this paper, LSP is described, along with a summary of its theoretical basis, with reference to larger bodies of literature which provide a richer analysis. The key components of this theoretical underpinning, which are supported by educational literature are explored further. The process of workshop design is then detailed. The execution of work-

shops is described, along with reflections and adaptations. Examples of the kinds of data collected are presented and analysed. Finally, recommendations for further development of the method are described in the context of an evaluation of LSP within an educational context.

The LSP Method

The LEGO® Serious Play™ (LSP) Method is one where participants use LEGO blocks as mediating artefacts to build symbolic or metaphorical representations of abstract concepts. In this way participants' conceptions of intangible thoughts and ideas can be concretised by a LEGO® Model. The sharing of such ideas through a physical representation allows them to be manipulated and positioned within a physical landscape which depicts how these ideas relate to those of other participants. This process provides a forum which facilitates rich discussion with other workshop participants. In general LSP, as envisioned by its leading developers, Roos, Victor and Rasmussen, is a workshop led by a facilitator, with between 6 and 10 participants, following a process of the facilitator Asking a Question, and the participants Building, Sharing and Reflecting. The workshop is guided by some simple rules:

- The builder owns the model
- The metaphor (symbolism) belongs to the builder
- Discussion is about the model

Some basic guidelines:

- Trust your hands
- Trust the process
- Everybody builds
- Everybody takes part

Each workshop follows the same process:

- Facilitator proposes a challenge
- Participants build
- Participants share
- Participants reflect

Theoretical underpinning

LEGO® Serious Play™ in its original form as developed by Johan Roos and Bart Victor of the International Institute for Management Development in Lausanne, and promoted by Robert Rasmussen, Director of Research and Development at the LEGO® Company, was shaped by psychological theories of learning, calling on ideas of; play, constructionism, flow, the Hand-Mind Connection, the use of metaphors and complex adaptive systems (beliefs) (Rasmussen Consulting, 2012). The LSP method was primarily developed in response to the need for a system to facilitate creativity and imagination for innovative and dynamic business strategies. These same theoretical frameworks have also been used in the educational domain where they have been adopted for what are arguably different purposes.

The idea of ‘play’ in education is well explored; it describes a process in which a person (most commonly a young child) learns to make sense of the world around them. This is resonant with the Piagetian (1936) view of constructivism which claims that a learner’s knowledge and meaning are ‘constructed’ through the interaction of their ideas and experiences. The Vygotskian (1978) perspective, in this context, holds that children learn to support previous learning and knowledge thorough play, and also gain new knowledge and understanding of slightly greater complexity within a ‘Zone of Proximal Development’ (ZPD). The fruitfulness of activities within this ZPD is echoed in Seymour Papert’s Idea of ‘Hard Fun’ (Papert, 2002), where activities are enjoyable, precisely because they are pitched at the right level of difficulty to maintain interest and engagement. More recent work around playing and games, looks to harness the motivational aspect of playing and games to engage learners (Kirriemuir & McFarlane, 2004). These approaches rely on creating environments which allow learners to engage with the play at a deep level (Jones, 1998). Malone (1980) highlights criteria for educational games which are aligned with achieving the Flow state described by Csikszentmihalyi (1975) which underpins the LSP method as developed by Roos, Victor and others subsequently. Papert (1986) also extends the idea of constructivism to one of Constructionism. In this, the belief that people learn by creating and testing mental models of the world around them, is extended to claim that this learning can be more effective if people are afforded the opportunity to create physical models in

the real world. Rasmussen (2012) discusses the idea of the close connection between the hand and the brain and makes the case that a large proportion of the brain is associated with controlling the hands. Whilst this idea is well supported by the image of the sensory homunculus, there is little to support that this connection results in a direct communication of knowledge or understanding. Nevertheless, there is a case to be made that the physical manipulation of objects, in the creation of mediating artefacts, exploits the close relationship of the hand and the mind.

The creation of these artefacts constitutes one part of the LSP process, the richness is not so much in the LEGO® bricks but in what they represent. It is the sharing and particularly the process reflection of LSP which allows deep insight. The value of reflective learning is well recognised in many domains and is not new. Dewey (1933) lays the foundations for the LSP process when he emphasises the importance of experience, interaction and reflection. Kolb (1984) reprises these ideas with his experiential learning cycle, utilising a process of experience, reflection, conceptualisation and testing of that concept. This process very much parallels the cycle of building, sharing and reflecting, found in a typical LSP workshop.

When reflecting on the development and application of LSP, there is a certain irony in the way LSP has enjoyed a measure of popularity and success in the commercial field, whilst being largely overlooked in the domain of education. The S-Play White Paper (Frick, Tardini & Cantoni, 2013), which provides a comprehensive review of the practice of LSP within Europe, largely describes cases where it has been used in a commercial context rather than an educational institution. There are of course a few exceptions (James, 2013; Nolan 2010). The basis for the LSP is strongly influenced by pedagogical theories and practice, yet LSP has not been embraced by the education community, except in the context of vocational education. The aim of the current work detailed here is to reclaim LSP practices for use in academic and pedagogical practice. The rest of this paper outlines the development of a series of LSP workshops with educational goals and describes the outcomes, findings and conclusions from the execution of these workshops in a variety of environments.

Developing LSP Workshops

The LSP workshops developed here, followed a procedure developed within the implementation of the S-Play - LEGO® Serious Play™ for

SMEs project¹. The S-Play project is funded by the European Union Lifelong Learning Programme (LLP)—Leonardo Da Vinci—Transfer of Innovation scheme. The Workshops were developed in ways which reflected the theoretical basis for LSP. They workshops were designed to encourage play, achieve a state of ‘Flow’ and to allow reflection, all of this through the process of building physical models with hands.

Early observations suggest that the process of building metaphorical representations of abstract concepts is not one which one can execute without at least some guidance. These LSP workshops all followed a similar format. The LEGO® part of the workshops commenced with a series of warm up tasks designed to take participants through from building (e.g. a Tower or a Duck), through building representations, to building analogies and metaphors.

Workshop Warm-up Procedure

First of all, participants were introduced to the goals of the workshop, for example:

- discuss teaching and learning with peers and identify good practice
 - explore and share their identity as a teacher and who they want to become
- or
- reflect on your role in the organisation
 - discuss development needs
 - identify characteristics of training strategies and explore how these relate to your own context

The theoretical basis for the LEGO® Serious Play™ approach was then explained, with varying degrees of detail depending on the audience. More academic participants generally preferred to hear a sound rationale supported by evidence before committing to the process. This commitment to the process was an essential requirement, as identified within the basic guidelines.

Following this, the rules, guidelines and steps were explained to participants. With the formalities complete, the LEGO® bricks were presented. Participants were given a few moments to (re)familiarise themselves with the bricks and play for a few moments. At this stage it was reinforced that

1. <http://www.s-play.eu>

the LSP process specified that play was an important component, that whilst the workshop had serious goals, the play component was essential.

The first step was for participants to become familiar with building and to start to play with the LEGO® bricks. To this end they were asked to build a free-standing tower. They were given two minutes to complete the task. The element of play was reinforced by introducing friendly competition with regard to the height of the tower, along with some commentary about progress of participants. After two minutes, the tallest tower is identified and celebrated. The purpose of this stage is reinforced for the participants, it is explained that all have learned how to build with LEGO® bricks. A second lesson is now introduced in which participants realise the attachment they have formed with their constructions and feel a slight loss at having to dismantle the towers they built.

The next stage is to introduce the process of building symbolic representations with LEGO® bricks. In this task participants are asked to build a model that represent themselves in some way. For many, this is their first experience of non-literal LEGO® modelling. On completion, participants are asked to explain to others how their model represents them. However, it can be useful in encouraging participants to assign symbolic significance to the models and reinforce the idea that models only have the meaning which is associated with them, this reinforces the rule that the symbolism belongs to the builder, and is often the most challenging stage. It is also at this stage where participants start the process of sharing and reflection. One variation of this task is to ask participants to move to a different model and explain how that one represents them. This approach deviates slightly from the LSP process, as it challenges the rule that the builder has ownership of the model and its meaning. However, it can be beneficial in encouraging more creative interpretation of the models and has precedents in storytelling and story sharing practices (Ohler, 2008).

Often by this stage participants are comfortable enough with the process to start building 'identity' models. If not, a further warm-up task may be used (e.g. Build a model of Monday Morning).

Method and Results

Beyond the warm-up phase, the workshops described here began to diverge. Three cases are presented. The first of these looked at pre-service primary school teachers, the second looks at pre-service secondary school

Mathematics teachers and the third looks at employees within the engineering department of a small manufacturing firm.

Pre-service Primary School Teachers

The participants in this workshop were trainee teachers. All had completed voluntary terms within primary schools prior to their training. Each of the students had at least some experience within primary schools as part of their Initial Teacher Training as well as some time spent as volunteers prior to their training. Participants were asked to build a model of 'Who you are as a teacher' furthermore, they were asked add a single small red brick to identify their greatest strength and write three phrases which characterised their models. Some results are shown below.



Figure 1: Pre-Service Primary Teachers' Teacher Identity

Pre-service Secondary School Mathematics Teachers

In this workshop, as before, the participants were pre-service teachers, with some class room experience. The main difference between this and the previous group was in the subject specialism and the age of the pupils which these participants were being trained to teach. Once again, participants were asked to build models of their identity. However, in this instance, with more time available.

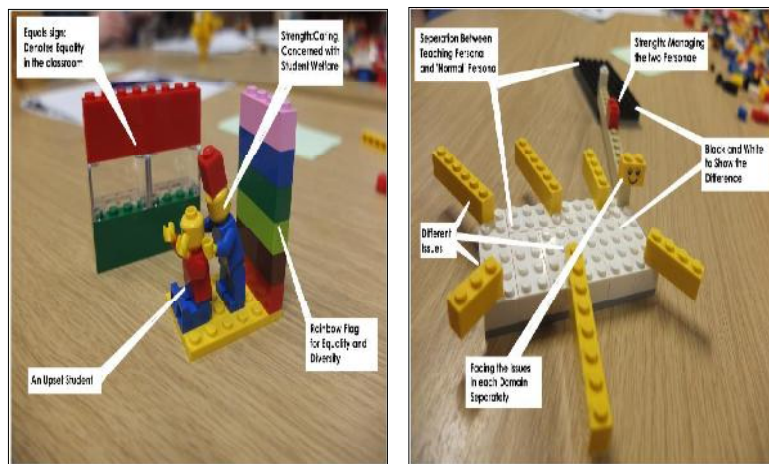


Figure 2: Pre – Service Secondary Mathematics Teachers' Teacher Identity

Participants were asked to build and share individual models of an ideal teacher then to build and share ideas of the kind of training which might move from their current identities towards their vision of the ideal teacher. These models were placed on a 'Landscape' Table with current models at one end, ideal models at the other and the training strategies in the centre. Participants were asked to cluster individual models, in terms of the ideas represented, to combine the individual ideas of the ideal teacher into one model which accommodated all the different views and to cluster the training models according to the kind of provision being represented. These processes required participants to discuss their models in detail and to listen to and reflect upon the ideas of others, so that a range of different views could be synthesised and represented as a single vision. Having completed this process, participants were invited to add connections to the landscape model. Each participant was asked to place a LEGO® Connections piece between one part of the self models and one part of the shared training model. They were then requested to place another connection between the shared training model and the shared model of the ideal teacher. In each case the participants were asked to make the connections between the components which represented the most important link between the parts of the landscape model. Participants were then asked to create a single joint

narrative which explained the model and included all components within the narrative. Illustrative examples of the results are shown below.

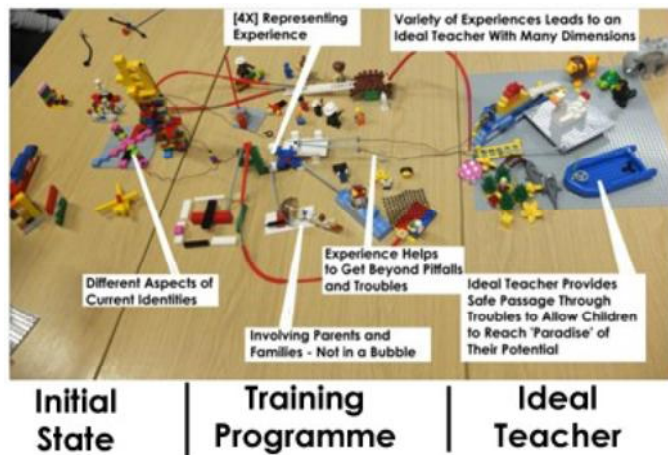


Figure 3: Pre-Service Secondary Mathematics Teachers' Shared Model

Employees in an Engineering SME

The participants in this workshop represented staff from all levels of the organisation except the CEO, from apprentices to Senior Management. The format of this work was very similar to the previous, with Pre-Service Mathematics teachers. Broadly, participants were asked to build how they saw their current roles, their desired future roles and some mechanism by which this could be achieved. The shared model task required that a single training strategy was modelled by combining individual models. Once again LEGO® Connections were used to identify key links between the stages of the model. Below we see a model of the aspirations of one of the apprentices and the 'final' landscape model of the current identity of the employees, their goals and a unified training strategy for the organisation to help them all to achieve that goal. Alongside this shared model, participants placed models which identified their perceptions of the barriers and enablers which will have impact on the implementation of the strategy.



Figure 4: SME Employees' Individual Aspiration and Shared Vision

Evaluation of the LSP Method in Educational contexts

At this stage, the point of the current study is not to analyse the results of the LSP workshops directly, but rather to reflect on the application of the process in educational contexts, in terms of learner identity and of identification of learner needs. The question which is often raised is whether or not LEGO® holds a special place in the implementation of the Serious Play™ method. Could any other mediating artefact serve as well as LEGO®? There is no fundamental aspect of the workshop design that restricts the mediating artefact to LEGO®. In principle, any medium which allows participants to express their understandings and conceptions in way which encourages play, sharing, flow and reflection would suffice. However, the workshops have demonstrated that, in the UK context, including international participants, LEGO® is a very familiar system. An emotional response of the participants can be observed when the LEGO® is introduced, usually a combination of excitement and nostalgia, which opens the door to

'play'. Whilst the same effect might arguably be achieved with other childhood materials such as modelling clay, the range of technical capability which can be demonstrated with such a medium may distract from the metaphorical and symbolic value of the models created. The method is based on symbols rather than close physical similarity. In this, LEGO® bricks generally afford a smaller range of technical expertise, with a high floor and a low ceiling. Models are not characterised by their technical or artistic qualities, but by what they represent.

The case could be made for other simpler and cheaper media, e.g. pen and paper, Fuzzy Felt or Collages. Whilst pen and paper suffer from the same problems of technical expertise as modelling clay, along with the other media, they are restricted to 2-dimensional modelling and don't provide the same close, manipulative connection as LEGO®.

In general, LEGO® may not be the only medium for such workshops. However, given that what is required is an easily manipulated mediating artefact which makes people smile and want to play, then LEGO® fits the bill nicely.

A certain amount of ramping is necessary, with some groups taking more easily to building symbolic representations than others. As such the range of warm-up activities should lead participants in small steps towards building metaphorical models. Groups more adept at such activities can skip a few steps.

The workshop design has thus far has proved to be successful. Even the most reticent of groups, some struggling initially to build representations of themselves, have achieved the end goals of building landscape models which represent a single narrative.

The sharing process of the workshops has been very effective. The focus on the models rather than individuals and the requirement for each person to share, creates a level playing field. Each participant has an equal voice, and as the builder, has ownership of its meaning. In this respect, everyone has equal time 'on the stage' and when on stage, their view is the only valid one and other participants must listen. Within a hierarchical organisation, this is one of the few times when all members have an equal voice and make an equal contribution to the discussion.

The iterative process built into the workshop supports reflection. Each stage of the building process is related to the previous and participants are given the opportunity to build their models in light of the views expressed

either by themselves or by other participants in the previous round. As the workshop progress participants are given and often take the opportunity to modify their models, adding richness to their meaning and expressing deeper insights.

The conclusion of the workshop comes with the joint narrative, as stated earlier all groups have managed to reach a consensus of a single coherent vision which encapsulates the views of often diverse group members. This is no small feat, as it is rare that groups of 6 or more people from different backgrounds or roles can agree on a single narrative which includes all their views. The mechanism, which allows this consensus is not yet clear. However, it is suggested that the equality of voice of the participants and the building of the shared narrative leads to individuals feeling that they have some ownership of the overall vision.

Concluding Remarks

The LSP workshops as presented here have produced very informative results. The LSP method is established and shown to have value within the commercial environment, particularly when focused on business strategies. The work presented here demonstrates that the LSP process can be effective in educational contexts, where individual goals are examined and synthesised to identify ways of meeting the learning needs of a group of individuals with separate but common aspirations. Despite varying initial responses, cautious reticence or immediate engagement, all participants reached the 'flow' state of effortless engagement by the time the central focus of the workshop was addressed. Future work in this area will be to develop LSP as an assessment tool, as a means to understanding people's conceptions of complex ideas, such as identity, or meta-cognition. At the moment, across disciplines, the internal validity of the LSP method is clear. In order to further develop LSP as a method within educational research, it is likely that work will need to be carried out to establish the external validity and value. This work need to make the case for the use of LSP as an educational tool. LEGO® is relatively expensive and can be time-consuming when compared to more conventional approaches such as discussions or a written piece. Further work needs to show that LSP can produce richer information than other current techniques. The results obtained within this study give cause for optimism in this domain.

Author's Brief Bio

Sean McCusker is a Research Fellow within the School of Education at the University of Durham in the UK. He has a background in Engineering with a Ph.D in Civil Engineering and having carried out post-doctoral work on Government-funded research projects in that field. Since moving to Education, he has led projects in Storytelling and ICT enabled learning. He has been involved in the development of new methods and approaches to education and has been applying creative ideas to adapt practices and techniques from a range of environments for use in education. He has worked on the development of curriculum materials for problem solving and materials for professional development in the light of new technologies and new educational goals. He is currently involved in various EU funded projects and has been a member of partnerships on various EU Lifelong Learning Projects over the years.

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