Learning How to Learn in Organizational Context through Simulated Projects

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ABSTRACT: In the organizational context, learning takes place in the projects. They constitute privileged organizational spaces for learning experiments and knowledge creation. At the individual, collective and organizational levels, learning occurs in the projects through action and reflective practices. This paper presents both the use and the conditions of implementation of a "real life" simulation game -a simulated project- as a way to teach Organizational Knowledge and Learning and the results of this pedagogical experiment. Through a content analysis of the reports of the students having already participated to this pedagogical experiment, this paper points out both the main benefits and the avenues for improvement of this simulated project in terms of acquisition and understanding of the mechanisms and the dynamics sustaining collective learning in an organizational context.

Key words: Action Learning, Project-based Learning, Reflective Learning, Simulation Game
How to teach organizational learning to postgraduate students? This issue is dealt through the pedagogical experiment related in this research paper. This paper presents the use, the conditions of implementation and the benefits of a ‘real life’ simulation game -a simulated project- as a way to teach Organizational Knowledge and Learning and the results of this pedagogical experiment.

PROJECTS AS ENRICHING SPACES FOR LEARNING IN ORGANIZATIONAL CONTEXT

In the organizational context, learning is done in day to day work. On the other hand, projects constitute privileged organizational spaces for learning experiments and knowledge creation. Interactions between project actors are multiple, leading to a high level of knowledge exchange (Garel, 2003). Assignments to projects, which by definition are limited in both time and cost and which have defined organizational spaces, appear to be paramount opportunities for learning experiments on a reduced scale in terms of time, space and cost. At the same time, for the whole organization, the projects play the role of learning tools that enable the organization to test the validity of certain hypotheses it has pointed out (Garvin, 1993).

In effect, the projects by their very nature modify the setting, they regenerate the system by creating new knowledge and transform the definition of the activities of the organization by developing new organizational competences (Sanchez, 2003). They may be seen, then, as ideal places for experimenting as defined by putting into practice new knowledge that does not conform to the accepted organizational rules (Midler, 1993).

SIMULATED PROJECTS AS LEARNING PLACES FOR LEARNING

So simulated projects constitute a pedagogical method to teach the concept of learning –both individual and collective- in organizational context. By simulating projects and putting learners in the position of ‘real’ projects actors, it is possible to reproduce, under certain conditions, learning experiments specific to project management. Learners can discover, by themselves, what learning means, and a various range of mechanisms related to learning. By living the ‘real life of a project’ development, by going through project definition to implementation, the learners can easily learn about learning.

Thus, simulated projects also called “microworlds” (term introduced by Seymour Papert in the late 70s) define workshops and “practice fields” where individuals experiment, interact, test different ways of doing and learn about themselves and about their teams. In this way, simulated projects constitute “learning laboratories” (Senge et al, 2000).

Definition of Learning
Edmonson (1999) explained that she defines the team learning process as the same way than she does for organizational learning: As an error-detection and correction process. So Edmonson defined “learning at group level of analysis as an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions” (1999, p. 353). Here, we define (as we do in our teaching) ‘organizational learning’ more broadly as “a collective phenomenon of competences acquisition and creation that, more or less deeply, more or less durably, modifies the management of situations and the situations themselves” (Koenig, 1996, p. 78).

At the individual, collective and organizational levels, learning occurs in the projects through action and reflective practices.

**Learning in the projects: Action Learning and Reflective Practices**

Action learning results from the interaction between a scheme of action preconceived and grounded in a theoretical or explicit knowledge and, on the other hand, the confrontation to actual experiences and to the consequences of action (De Fillippi, 2001). The concrete experiences have to be interpreted to produce sense (Dixon, 1994). The reflective practices that constitute the second stage of cycle model proposed by Kolb (1984) (and called “Reflective Watching”, see Figure 1, page 4) “refer to the processes or means by which project participants make sense of their project experience and its meaningfulness” (De Fillippi, 2001, p. 5).

Reflection that refers to the ability to articulate and to make what it has been achieved in the course of action is essential to learning in order to convert tacit experience into explicit knowledge through a process of externalization (Nonaka, 1994) and to produce new knowledge as a basis for future action (Raelin, 2001; DeFillippi, 2001).

The projects constitute paramount organizational spaces for developing awareness and inquiry skills that enable the managers to better understand their assumptions and the consequences of their actions. Project-based learning consists in using projects for creating such a context for systematic inquiry and questioning, action learning and occasions for reflective practices (Ayas & Zeniuk, 2001).

The capability to reflect on action in the project, to question the way the organizational actors are doing things, interacting and making decisions, to develop awareness to the consequences of their actions and decisions, to make sense to the results of their actions constitute as many examples of our learning capabilities as defined by Senge et al. (1999, p.45). Thus, as Nonaka (1994, page 22) explains: “one way to implement the management of organizational knowledge creation is to create a “field” or a “self-organizing team” in which individual members collaborate to create a new concept”.

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**Presentation of the Kolb’s Model**

Inspired by the work of Lewin (1942), Kolb (1984) developed the Experiential Learning Theory model made up of a four-learning style approach and of a four-stage learning cycle. This theory offers an understanding of the way the individuals are learning through experience-based reflection. In the present study, we are only focusing our attention on the four-stage learning cycle proposed by Kolb. The Learning Cycle contains the following stages: the concrete experience (stage 1) provides a basis for the observation and the reflection (the following stage) that call an abstract conceptualization stage (stage 3) -that itself produces new implications for action through an understanding of the relationships among the events- leading itself to a new experimentation (stage 4). The four stages of the Learning Cycle can also be translated as: Feeling-Watching (or Reflecting)-Thinking-Doing (cf. Figure 1).

![Figure 1 - Kolb’s Learning Cycle](image-url)

The pedagogical experiment, entitled “Management by Project and Collective Learning Dynamics”, is a two-day course session –including a one-day lecture (with case studies and discussion) and a one-day simulation. It has been conceived to cover the four stages of the Kolb’s Learning Cycle. This two-
day course session is based on the Method of Analysis and Management of Projects Simulated (MAP-S) and is described in the next part.

**TEACHING ORGANIZATIONAL LEARNING THROUGH A SIMULATED PROJECT**

The Learning Approach through Simulated Project (LASP) is first of all a simulation game. It has been developed by the Centre International de Management et d'Analyse de Projet et de Programme of a French business school, ESC Lille at the end of the 80's (Mazouz & Tremblay, 2001).

The original method called Method of Analysis and Management of Projects Simulated (MAP-S) was originally developed as a pedagogical tool for teaching Project Management. It is simulating a one day project of a new product development; the students have to develop and operationalize a new high risky product between 9 AM and 5 PM. At a theoretical level, this method is based on the community of practice. At a practical level, the original objective of this pedagogical method did not consist in training project managers in one day but only in identifying the real needs of the students in term of competences, theories and tools in the domain of project management.

This simulation tool provides also performance measurement tools used to evaluate the groups of students participating to this one day experience. These tools are relative to the budget and schedule objectives completion but also to the performances of the product itself, its reliability and its congruence with the client specifications (the scenario of this simulation game is quickly described here after).

This simulated project is associated with a one-day lecture occurring before the simulation and aiming to provide a theoretical background and a conceptual content to the students. This course deals with the themes of Management by Project and Collective Learning Dynamics (individual and collective learning, knowledge creation and transfer process, teamwork, the role diversity, of communication and of leadership, factors favoring or blocking learning in the context of projects).

During the simulation, the students have to take notes about the progress of the project and on its different aspects (i.e. teamwork, events, interactions between the team members). These notes provide the basis of the reflective work they have to produce after the simulation. This individual exercise of reflection takes the form of a report due to the professor few days after the simulation.

The reflective practice on action in the project helps the students to understand the mechanisms generating, fostering or braking both individual and collective learning in the organizations but it also constitutes itself a paramount way for learning in the projects (Raelin, 2001).
Scenario of the simulated project: The project 281066-MAS-CP of DestSur International*

1- Context of the project
DestSur International is a company located in Montreal (Canada) highly specialized in the industry of the surface transport of high-risk substances and machines. DestSur International designs and develops unique means of transport and trailers, and ensures the transport of exceptional engineering works. The management by projects has gradually become the organizational mode, and the autonomy granted to the teams and the projects managers has increased. So a particular attention is given to the individual and collective creativity, and to management initiatives leading to the success of the projects.

Today, the top management of International DestSur gets ready to take up a new challenge. Indeed, taking into account the strategic stakes, the financial repercussions and the congruence of this project with the internationalization of the company, International DestSur answered the call for interest launched by a large multinational firm based in Marseille (France), and made the deal. From their reception, the contract specifications were transmitted to the head of programs and projects who entrusted the project-team. The participants of this simulation are supposed to belong to the selected teams and they have set up and test a prototype corresponding to the specifications of the project 281066-MAPS-CP led by International DestSur.

2- Specifications and Elements of Analysis
The examination of the specifications of the project n° 281066-MAPS-CP by the head of the programs and projects of DestSur International highlights the following elements:

- the deal consists in manufacturing a specific carriage machine, and in using it for the surface transport of a unique industrial module;
- the manufacturing of the module to be transported is in progress in a factory established at 20 km from Montreal;
- the module is intended for oil industry;
- the module contains extremely fragile measuring instruments;
- At first sight and from a financial point of view, the project is classified by the experts of International DestSur in the category ‘high risk’ projects;
- At the operational level, the transport must go off in two stages:
  - In a first stage: Transporting the module on a distance of 13 km, from the factory to the Montreal’s harbour. The road will be marked out and completely protected.

* Authors: Bachir MAZOUZ and Benoît TREMBLAY. Used with the permission of Bachir MAZOUZ. This simulation is inspired from the a training exercise developed by Roger DECLERCK at The International Centre for Analysis and Management of Programs and Projects
• In a second stage: Transporting the module from the harbour to another site located at 7 km from the harbour. The ground will be marked out, but very uneven.
• The delivery time is not negotiable, and the penalties for delay are very high.

3- The Project 281066-MAPS-CP
The head of the programs and programs entrusts the assignment of designing and of setting up a prototype of a specific mean of transport to you. This prototype must make it possible DestSur International to ensure the transport of the industrial module specified above. In spite of the high risks revealed by the feasibility study undertaken by a team of experts and taking into account the strategic value of the project, the head of International DestSur is ready to accept a moderated rate of profitability.

4- Potential Costs of the Project
The Management of the projects and programs of DestSur International makes available of the project-teams the most reliable estimates which it could obtain from its partners and various sources of information. These estimates relate to the expenditure likely to be engaged by each project-team within the framework of its activities of:

1. design and assembling of the transport machine;
2. transport of the industrial module.

Lastly, these estimates are regularly revised before being transmitted to the members of project-teams.

Parts and supplies
The project teams - have to take account of the prices applied by the supplier of equipment and tools. These prices are not detailed here. [...] Of course, the supplier is one of the various stakeholders met by teams during the one-day project. Others stakeholders of the projects are represented by experts, client and Destur executives as well.

Hire or acquisition of material
The project-teams have an important basic documentation, two trial circuits, an information network, and other services allowing them to achieve their assignment. The rates displayed by the services’ providers are not detailed here. [...] 

Various expertises
The project-teams can beneficiate from external services of experts. Flat rates are applied to the various consultations and expertises that the teams could ask for. The rates are not detailed here. [...]
5- Deadline for Delivery and Penalties for Delay
DestSur International has to ensure the transport and the delivery of the industrial module as soon, the Sunday 19 June 2005 and at the latest, the Thursday 23 June 2005 (for the intensive day, see the box hereafter). Bonuses and penalties will be applied by the client according to the respect of the negotiated times or delays.

6- Potential Repercussions of the project 281066-MAPS -CP
If it is brought to its successful conclusion, the project 281066-MAPS-CP constitutes a real and important business opportunity for International DestSur. It would make it possible to this company to secure its market share and satisfy the international ambitions of its leaders. Thus the strategic stakes are huge. the financial repercussions of this project could help the company to face a worldwide and very intense competition on a niche increasingly coveted by the large multinational firms. Indeed, the basic amount of the contract is 582 940 $, to which will come to be added a bonus of 10 000 $ for each day of saving made by DestSur International on the contractual schedule of delivery (with a ceiling of 30 000 $). Moreover, it will be taken into account a bonus of 3 000 $ for each hour saved compared to the contractual schedule of the transport, i.e. compared to the cumulated time anticipated to cover the marked out distances.
Adaptation to the needs of the intensive day

For teaching ends, the Units of Account will be as follows:

- Time: minute and second
- Distance: meter

The project-teams have seven hours (from 8:30 am to 3:30 pm) to design, set up and to test their prototype. The specificities, the opportunities and the constraints of the project are summarized as follow:

- The final tests consist in transporting a simulated module (showing characteristics quasi similar to the real module). These tests will begin at **3:30 pm**.
  
  A bonus of 10 000 $ is applied to each 15 minutes saved (on this schedule) with a ceiling of 30 000 $.
- At the contrary, any delay recorded beyond 3:30 am will be penalized by an amount of 175 000 $.
  
  No vehicle will be accepted beyond 3:50.

The transport of the (simulated) module will be carried out on two marked out tracks. The first section is 13 meters long and the second is 7 meters long.

The (simulate) module must be delivered in a cumulated time (on the two sections) between 30 and 50 seconds. A 3 000 $ bonus is applied for each 5 second saved (so less than one minute). At the contrary, a penalty of 15 000 $ is applied for each 5 seconds delay (so more than two minutes).

The drifts of the transport machine, out of the marked out tracks, can cause considerable damage to the industrial module. Each drift will thus be penalized by a flat rate of 75 000 $.

Participants in this simulation

The two-day course entitled “Management by Project and Collective Learning Dynamics” -including a day of lecture, discussion and case studies and a day of simulation- was successively taught in two classes of a MSc of ‘Knowledge Management and Business Intelligence’. The first years, I had 11 students (2 teams); the second year, 21 students (4 teams) have experimented the simulation and worked on learning concepts and practices by the same.

The benefits of this simulation: the completion of a learning cycle

The content analysis of the reports (not detailed here) of the students having taken part in this pedagogical experiment allow me to point out the main benefits of this simulated project in terms of acquisition and understanding of the mechanisms sustaining collective learning in a project context (see Figure 2 below).
In conclusion, beyond the originality of the experiment and of the nature of the project (see Appendix), the students underlined “the complementarity of the theoretical content [tough during the first day] and the simulation that allow [them] to assimilate the necessary knowledge to manage people in the projects”.

Professors, in the same time, enjoy to learn a new way to teach learning, avoiding the stress of been “too much abstracted” or “too au too autocratic”.
Bibliography


**Presentation Mode:** preference for poster.
Appendix

examples of students’ vehicles