Training Egyptian Middle Management On System Dynamics

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Abstract

This paper presents our experience in training middle managers from Egyptian Governmental organizations on system dynamics (SD) as a part of the Egyptian educational organizations efforts to increase managerial skills and raise business viability. A step-by-step feedback-teaching method is employed. We prepare a module of the material; teach it on a small sample to get feedback to further enhance the quality of the material developed. The paper starts with a discussion on the need for this course. It then gives a brief on the "Innovations in Professional Training in Egypt" project funded by Tempus Programme. The paper discusses the course preparation process and the students' feedback regarding the system dynamic education offered.

Keywords: *System Dynamics education, Egypt, Management, Feedback-Teaching, Professional Training*

1. Problem Overview

Egyptian managers and workers do not yet have the skills required for modern competitiveness and new entrants do not come into the workforce with the critical thinking and practical skills that allow them to take full advantage of on-the-job training. Survey data in the 1998 and 1999 Global Competitiveness Reports confirm Egypt's low international ranking on workforce skills and training institutions [14].

One cause of this problem is the educational system's difficulty in producing entrants educated and trained to meet workforce needs. Long-run solutions require changes in the system's institutions to upgrade quality, teacher skills, and curricula. However, this will take time to put in place and more time to produce results in terms of higher-skilled graduates.

Nevertheless, the problem of educating the mature working man i.e. the problem of lifelong learning, shorter and more effective training solution could be employed to raise the Egyptian managers' competitiveness. The need has been identified in the Country Strategy Paper and National Indicative Program of Egypt.

The following three questions are the challenges for the problems of lifelong learning:

- How to bring education and training closer to the demand?
- How to widen access to education?
- How to assure quality and efficient delivery?

2. The Solution

2.1. Overview

The University of Sunderland, University of Cottbus, the Suez Canal University (SCU), the Cabinet- Information and Decision Support Centre (IDSC) and the Suez Canal Authority have gathered as partners in an educational project called "Innovations in Professional Training in Egypt" funded by Tempus Programme. The project aims at providing an effective professional training program, in order to close the skills gap and to respond to the evolving requirements of the labor market.

The first challenge is met by analyzing the demand and providing courses appropriate to that demand. There are many areas where training is needed but three important sectors have been identified as the Egyptian Civil Service, the university support systems and the public sector. The Egyptian Cabinet has recognized the Civil Service need by creating the Information and Decision Support Centre (IDSC) which in turn has created the Information Technology Institute (ITI). These institutions are specifically set up to train the Civil Service but they cannot fully satisfy the demand as the courses they currently provide do not cover all the skills that are needed.

SCU has identified a similar need in its administrative support systems and also with the Suez Canal Authority (28000 employees). SCU has also recently established "a University Education Development Centre (UEDC). This centre is very well recognized for its unique comprehensive organizational structure including organizational units such as: Total Quality and Accreditation, E-Learning, Information and Communications, HR Training and Development, Institutional Development, and Project Management Unit. For the strategic importance of the centre, it reports directly to the president of the university, who is, in the same time, the chairman of the board of directors of the centre. The centre is applying the most up to date staffing policy, namely, flexible staffing. This policy is manifested in having very few permanent staff: the executive director of the centre, and four administrative staff. Using the flexible staffing policy along with the flexible work station approach, the centre has been able to benefit from the expertise of the highly qualified academic and administrative staff of the university either in leading its organizational units or in participating in its development and modernization projects.

In all these institutions, there is a need for training courses for top and middle management that give a more holistic view of problems and a more systemic approach to solving problems. The old way of thinking is not enough. Fortunately, there are new methods that can help to manage these situations.

The second challenge must be met by organizing the Egyptian Adult Education System to allow such training to take place. The normal Egyptian Education System is not set up for lifelong learning. There is a need to widen access to the education process. Education needs to be adjusted to the working pattern of the staff and delivered in-house. At the present time, education in Egypt is focused more on full-time students than training for people in employment. While the current scope and pace of economic reform and restructuring make the expansion and upgrading of post-experience management training an urgent

priority, institutions lack the know-how for establishing continuing training, developing their market orientation, and upgrading the quality of their programmes and training services.

The third challenge is to ensure that any new educational structures and processes are run efficiently and have quality assurance processes.

Using the experience of the academic partners (The University of Sunderland and University of Cottbus) to set up a purpose built centers for the ITI and UEDC. Eight members of staff from each institution will be trained to be trainers. These trainers will then teach four specially prepared courses (developed by this project) to administrative and decision-making staff in the Civil Service and the Port of Suez Authority. As extra value, these courses can be added to the postgraduate curriculum of the University of Suez. Accreditation for all courses will be sought from Egypt, the UK and Europe.

An equally important aspect of the project is widening of the vision of the Egyptian academics. It is expected that two members of staff from UEDC and two from ITI will work with one Western Academic on the preparation of each course. The Egyptian staff will then be the trainers that deliver these courses.

The sustainability of these courses is an important element. The demand at the Civil service and the Port of Suez Authority is very large so the courses will be used for many years. There will also be an extra bonus in the fact that the University of Suez Canal will insert these courses into their own post-graduate curriculum and full time students at the university will also be able to gain befit from them.

In this project we address the life long learning by designing and delivering a new suite of four courses which will be taught at two specially designed centres: - the ITI and the University Education Centre (UEDC) at the University of Suez. The courses will be prepared by ITI and UEDC with the help and advice of Western experts from Sunderland and Cottbus. CEDEC (Centre for Education and Distance Learning in Sunderland) will advise how to assemble these courses which will ensure efficient delivery and conform to international quality standards.

These courses will be designed in consultation with three major public Egyptian Services organizations whom are partners in the project and who will then provide middle and top management clients to take the courses. The feedback

gained will help improve the courses and also help to formulate a national Egyptian plan for Adult Education and Lifelong Learning in Egypt.

2.2. The Courses of the Project

The courses are planned to follow the following subject areas:

1. Systemic Thinking: The worldview has changed in the last thirty years. It is now understood that the world is a global system which means that the interconnections between the parts is as important as the parts themselves. Systemic Thinking is holistic thinking which recognises this fact. This course will concentrate on general systems ideas and how they relate to Egypt.

2. Organisational Structure: Another important idea is that the efficiency and the survival of a structure depend on how it is organised. This is especially important in the case of multi-national companies. A major idea is that of recursion where systems are embedded within other systems e.g. the system 'Egyptian Governance" is contained in another system called "Middle East Governance" which itself is contained in a system called "Global Governance". One cannot study any system without examining the systems above and below.

3. Decision Making: The content of this course is obvious but it must be tailored to the specific context of the public sector.

4. System Dynamics (SD): A well established methodology that enables efficient and effective decisions to be made. It has excellent, easy to use computer software which makes it very useful to show behaviour over time.

This paper is concerned with the fourth course, it discusses our experience in training middle managers from Egyptian Governmental organizations on system dynamics as a part of the efforts to increase managerial skills and raise business viability.

3. The System Dynamics Course

3.1. The objective of the system dynamics course

The objectives of a system dynamics education as suggested by Jay Forester 1994 might be grouped under three headings which are developing personal skills, shaping an outlook and personality to fit the 21st century, and understanding the nature of systems in which we work and live [1].

These objectives are the main challenges that are facing us in preparing the material that develop the personal skills of the managers, shape their personality to adopt more innovative ways of thinking and help them to understand the real problems hindering the performances of their institutes as shown in figure 1.

As the "student" is a working manager, great emphasis must be placed on the style and pedagogy used in this course, thus the course is practically based and examples are taken from the problems facing the organizational systems in the public sector.

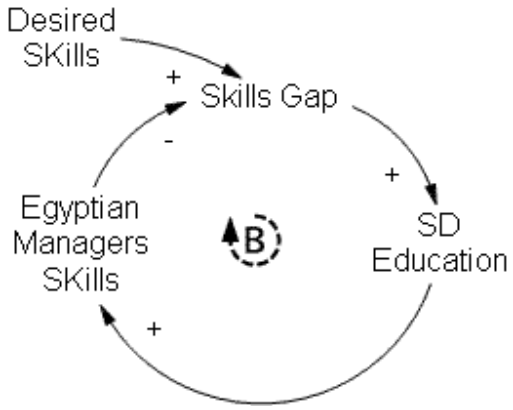

Figure 1: The need for System Dynamics (SD) education

3.2. SD Course Development

The SD course that is being developed for middle management consists of four modules, each module is two days. In each day two lectures. Each lecture is three hours. The course development is itself a feedback process. We prepare a module of the material; teach it on a small sample to get feedback to further enhance the quality of the material developed.

3.2.1 First Version of Module 1

The first version of module one was prepared by May 2005. Module one was an introduction to system dynamics and the modelling process. In addition to practical session where students practice drawing causal loops and building simple stock and flow diagrams using Powersim Software.

3.2.2 Feedback on the First Version

As the material is prepared mainly to shape the students way of thinking and not just to add more knowledge, the material was taught on a sample of Egyptian Civil Servants to get their feedback on June 2005.

An extra session was conducted to get students feedback. All students agreed that the course needs more time, and that four lectures where not enough to get experience on the modelling process. Some of the students were computer illiterate, which made them unable to use the modelling software. Minority had difficulty with the material language; the material was prepared in English while their mother tongue is Arabic. Few students succeeded in getting the whole idea of the course, but they still needs more practice to build up an experience in this field.

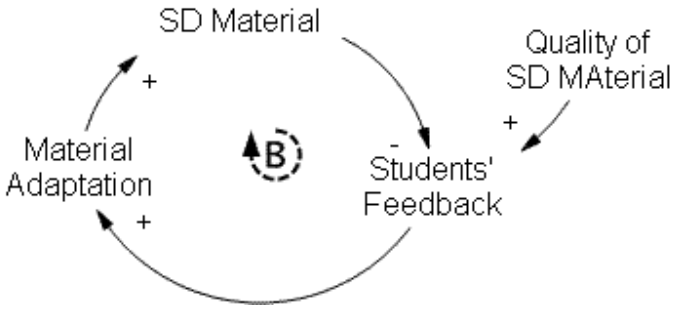

Figure 2: Causal loop diagram for Students' Feedback

These students' comments were very useful as a starting point for version two of module one on more than one aspect. The first the content layout had to change to be simpler as an introductory module for system dynamics.

The chosen students to attend the course were another aspect to regard; computer literacy and good knowledge of English language were now

prerequisites for the course. The students also recommended using multimedia aids (like videos and animated gifs) and more examples from the Egyptian Environment. 'The students also remarked that the benefits of using system dynamics methodology was not discussed enough. Figure 2 shows the causal diagram of student feedback.

3.2.3 Second version of Module 1

The second version of module was developed in February 2006 and was also taught on a sample of students for their feedback. The material of module had clear objectives which were to give the students an introduction on system dynamics and different steps of the modeling process and feedback thinking. The outcomes intended were introducing students to model simple stock and flow structures and to give them a good experience in developing causal diagrams.

The material by then had a lot of causal loop diagrams that described contemporary problems in the Egypt. For example a causal diagram describing the building of Aswan High Dam back in the fifties and another causal diagram was drawn to show the unanticipated effects of the High Dam after forty years of building it. Another causal diagram for the overuse and misuse of the River Nile was given as an assignment to be done and discussed by the end of the module.

The second version of module one included explaining the different system archetypes [2]. A lot of videos were included in the material as examples of different archetypes that were taken from famous Egyptian movies. Causal diagrams were drawn based on these parts of movies to make the students more familiar with the idea of the archetypes. Students were also encouraged to suggest examples of different archetypes from their own working environment.

3.2.4. Feedback on the Second Version

To get a better feedback on the second version of module one, the students sample were middle management with good English language and computer literacy from different public organizations affiliated to ministry of health, the ministry of tourism, Suez Canal Authority and others.

Again the students' feedback was gathered by the end of the module. The students were satisfied now with the content and the time assigned to it. The students were very eager to know more the benefits from studying system

dynamics and how can it be used as a decision support tool. They were pleased with the course examples and teaching aids. Students gained a good experience for developing causal diagrams but asked for more time for practice. They also asked their teacher to help them with building causal diagrams for real problem in their working environments. To sum up the students were pleased with the course that they insisted to be updated with more information and dates of the next modules.

3.3. Current Status

As students' comments were positive, the development of the first module has now finished and the second module is now being prepared for.

At this point, the objective of the course was evaluated and set to be developing students' experience in studying dynamic problems; to understand the underlying structure and evaluate possible policies that eliminate the dynamic problem.

Consequently, a second look was given to the course layout to find the most appropriate layout. The suggested layout is as follows:

The first module of this course is an introductory module that overviews the system dynamics modelling process and discuss the feedback thinking in details. In this module the students gain the required experience to draw causal diagrams that explain their mental models concerning dynamic problems. They are also introduced to Powersim software as a system dynamics simulation modelling tool.

The second module will give students the required experience to translate the causal diagrams to stock and flow diagrams. Students will learn to master the Powersim software.

The third module will enhance the students modelling capabilities through learning advanced concepts such as delays, co-flows, formulating nonlinear functions, model validation, ..etc.

In the fourth module each student will choose an Egyptian case study to model.

4. Conclusion

To eliminate the Egyptian managerial skills gap, the Egyptian educational institutes (SCU and ITI), and foreign Educational Institutes (The University of Sunderland, University of Cottbus) gathered in a project that aims at designing and delivering the needed courses for increasing Egyptian managers skills and competitiveness.

The courses suite included four courses; systemic thinking, organizational structure, decision support and system dynamics. This paper tried to transfer the experience of designing and delivering the system dynamics course through a feedback-teaching process. We prepare the course. Teach it on sample students to get their feedback. Adopt students' feedback into the pedagogy and teach it again to obtain a better version.

Our aim from this feedback-teaching process is to succeed in developing the Egyptian managers' personal skills, shaping their personality to face global competition, and understanding the nature of systems in which they work and live.

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