A CRITICAL DISCUSSION OF THE APPROPRIATENESS OF CHECKLAND'S SOFT SYSTEMS METHODOLOGY IN EDUCATIONAL RESEARCH

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ÖZET : Türk Hükümeti bilgi teknolojileri'nin ekonomiye olan katkısına büyük önem vermektedir. Bu nedenle de projeler başlatmıştır.

Bu makalede   böyle bir projenin Checkland'ın soft systemler metodolijisi ile incelemesi ele alınmıştır.

Anahtar Sözcükler: Checkland'ın soft sistemler metodolojisi, bilgi teknolojileri.

ABSTRACT: The Turkish Government has placed great emphasis on the importance of Information technology (IT) to the Turkish Economy. This emphasis on IT was the stimulus for a pilot project.

This paper presents an evaluation of the research framework chosen to evaluate that pilot project. Checkland's soft systems methodology was used as the therotical framework for the research as it is specifically designed to accomodate complex human activity systems. The framework proved less than adequate, however, because it has underlying assumptions which could not be met in the Turkish situation.

KEY WORDS: Checkland's soft systems methodology, Information technology.

1. INTRODUCTION

The context for this study is the CAL project (1988), the government initative to stimulate the use of computers in education. Initially 46 Lycees based in the cities of Ankara, Istanbul and Izmir were selected to take part in the project. Within these schools the initative would focus on the area of Mathematics, Chemistry, Physics and languages. In the summer 1989 the sample was reduced. The research project of this paper forms part, was therefore conducted within the schools (1).

2. CHECKLAND'S METHODOLOGY AS AN INVESTIGATIVE TOOLS

The overall objective of the research was the use of computers in schools in Turkey.

The aim of the research was to develop a theoretical framework of educational computer activities in the Turkish context. Education itself is a system, of which the school is a subsystem. However, education is a complex system with ill defined boundries. The system approach is a concept rather than a methodology. To capture this system methodology which took cognisance of the difficulties was needed in defining the component parts of the Educational system. It is for this reason that the researcher chose Checkland's soft systems methodology.

Checkland's soft systems methodology uses the concepts of the system the find a structure in apparently which may be used unstructured soft problems and provide solutions to the problems. It is based on building conceptial model to be compared with the real world.

The methodology contains two kinds of activities. Stages 1, 2, 5, 6 and 7 are 'real world' activities necessarily involving people in the problem situation. stage 3, 4, 4a and 4b are systems thinking activities which may or may not involve those in the problem situation, depending upon the individual circumstances of the study.

First of all, the methodology involves describing situation in which the perceived problems lie. The methodology works to define real problems in real context, grasping all elements of the situation, and works to avoid producing over simplified, bounded descriptions of what are complex pheonema.

Second stage of of the methodology is to analyse the problem situation in a neutral way which does not distort the problem into any particular form.

Third stage is the crux of the methodology. It is formulation of "root definitions" which is necessary to choose a way of viewing the problem situation. "Root definitions" have the status of hypotheses concerning the eventual improvements of the problem situtation by means of implemented changes which seems to both the 'problem solver' and the 'problem owner' to be likely to be both desirable and feasible.

Fourth stage of of the methodology consists of building conceptual models. These models are structured sets of activities which are the minimum nec-

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essary activities for the system to be one named in the "root definition".

Fifth stage of of the methodology is the stage where the conceptual model and 'rich picture' are compared. The 'rich picture' is achieved by listing elements of conceptual models and writing down the real world mechanism. This activitiy often reveals gaps in the analysis and the final list of differences forms the basis for debate in stage 6.

In sixth stage of the methodology in seventh stage of of the methodology possible changes or future plans are discussed in terms of feasibility and desirability.

Once the changes have been agreed they can be implemented and may give rise to new set of problems.

Checkland's methodology defines 4 key participants in the building of the system model: the problem solver, decision makers, users and clients (1).

The assumptions and facts about Turkish schools derived in the analysis phase were based on the researcher's own knowledge. In order to reduce possibility of bias, assumptions and facts were checked againts several sources with a literature review and reconfirmed by several educators in Turkey (1, 2).

2.1 A Critique of Checkland's Soft Systems Methodology and an Evaluation Research

A perceived insufficient use of computer activities in schools was the starting point of this research. The main aim was to identfy and understand why CAL was not being used effectively in Turkish Schools. In order to do this a prestigious government project was monitored and evaluated (1, 2).

To maintain a degree of objectivitiy from this project, a research methodology which allows issues to emerge from the research data were chosen, rather than imposing a 'soft' systems methodology does not start with an expressed problem definitions. Its aim is to identify the problem itself. In other words, the definition of the problem situation is the target of the research.

In order to avoid to production of inappropriate solutions Checkland's methodology directs the researcher to work within the boundries of the real world. Once the constraints are known, models are designed within these constraints of the real world i.e. the methodology requires the researcher to work within a real context at all times.

The outcomes of the application of this methodology are a number of sub-situations which will

lead to improve effectiveness and efficiency of the system under investigation. The methodology does not a single global solution. It is always possible to do further research on the improved problem situation to increase that efficiency. Checkland's methodology allowed the researcher to describe and analyze the actual situation.

The focus on real world problems and partial solutions made the methodology an attractive tool to the researcher.

Checkland's methodology which is qualitative approach is often intuitively valid but difficult to verify, in contrast to the quantitative approch which may model accurately something which has little relation to realitiy. Clearly both approches have their advantages and disadvantages. Checkland's methodology can be applied in any instance where a consceptual model in sought, for example before any attempt is made at quantitative modelling.

The outcomes of the research investigation are in some ways disappointing however, and the methodology has proved difficult to apply in the educational context.

2.1.1 Setting Up The Model

There were some dangerous stages of the application of Checkland's 'soft' systems methodology. Two of the problems that were faced by the researcher were related to the building of the conceptual model (s). One was creating a model which was not simply a description of the real world situation and other was avoiding the creation of an utopian model which was not simply a description of the real world. The maintanance of a balance point between a simple description of a reality and an idealistic model, according to Checkland is built into the methodology to enable the model builder.

Avoiding the utopian solution was achieved by working within the environmental constraints which were suggested by the methodology . In other words, models were created within the real world limitations. Avoiding creation of a model which was simply description of the real world was achived by analysing the descriptive model (rich picture); noting points of tension, for example: the mismatch between decision makers' and users' goals, and providing mechanisms to reduce the tensions creating such a mismatch. Through the survey researcher captured not only the opinions but also the attitudes of the people in the problem situation. This information and information collected through the literature review and the researcher's own knowledge highlighted the way through modelling stage. Furthermore, when the researcher reached the

comparison stage appreciable differences were found between the conceptual models and the real world situation.

2.1.2 The Problem of Inconsistent of Viewpoints

Another problem in this study was contradiction between the decision makers' points . They were skilling a society but they put in place a project which was designed not to produce IT skills but to support existing curricula. To meet their expressed goals of creating an 'IT Aware' and 'IT Literate' population the educational innovation needed to be focused on IT skills. This would require new courses on 'IT Awareness' and 'IT Literacy' rather than computers being used as a tool in teaching and learning.

2. 1. 3. The Matching of Disparate Realities

This methodology could be queried because of the degree of subjectivity of the research. Subjectivity is, in fact, the characteristics of the methodology itself. The choice of relevant systems, root definitions, and conceptual models were all subjective. However they are all defensible from the researcher's point of view. As was stated by many authors (3, 4) and by Checkland himself (5), 'soft' systems modelling is a subjective process because no two people will look at any particular aspects of the world in the exactly same way.

Identifying a system is not a purely objective process since the purposes and interests of the researcher will be involved. There is no single tenable account of a human activity system. Instead there is a set of possible accounts, any of which may be valid according to a particular point of view. The choice of view is subjective and cannot be judged according to its bearing on the problem situation and case must be accompanied by an account of the observer and the point of view from which his/her observations were made. The choice of the relevant system is entirely subjective. But this does not mean that it is an arbitrary choice. Although it is very difficult to judge whether a given relevant system is right or wrong. It is possible to asses to what extent the relevant systems helps in our understanding of the problem situation and contributes to the problem solving (6, 3, 7).

It follows that in studying the social world we cannot follow the methods of the natural sciences. Instead we must proceed by subjectively trying to understand the point of view and intentions of human actors who construct that social world. Therefore, the importance lies in 'soft' 'appreciative' systems (5) that individuals employ in understanding and constructing the social world. In this study, however, it was not possible to bring about perceptions

so far apart that could not overlap. This was a major problem when reviewing the perceptions of the teachers and the students.

2. 1. 4 The Problem of not Acquiring Real Viewpoints

The methodology allowed the researcher to search for opinions, attitudes of users and opinions of decision makers, because of the context the researcher felt that users and decision makers often gave the "correct" answer, and did not impart their real wievs. Therefore, the model cannot be used as basis for manipulating the real world, but they can only be used as a structure to debate among the various actors concerned with problem situation. One of the other impacts of the subjectivism is that 'soft' systems methodology tries to work for change at the level of ideas (8). But if people's 'Welstanschaung' is linked to other political and economic structure in a constraining social totality they may not be so easily changed. Changing of 'Welstanschaung' might depend on changing other social facts. This methodology provides little direction as to how to operate in the circumstances where the conceptual model demands radical change (5, 3). It may be that the methods they employ are not appropriate to the social systems with which they seek to deal (8).

In this respect, this methodology and its results cannot work in Turkey's conditions because the cultural and political structures of turkey are not yet flexible enough for reformists movements.

The methodology is dealing with human activity system. Any human activity is socially and culturally bound. Societies' culture, politics and traditions effect the human nature. Therefore, the methodology cannot be equally workable in all societies.

2.1.5 Refinement of The Model

This methodology requires improvements to the system under investigation to emerge from a generalized and theoretically enhanced debate about feasible and desirable situation. Participants play a significant role in 'soft' systems methodology and the difficulties faced here in defining players was a serious drawback in implementing this research. In the present study, participants knew too little to meaningfully contribute to the 'rich picture' and this affected the debate about feasible and desirable changes as perceived by these participants. The data provided by these players needed to be of sufficient quality for a meaningful description to take place.

One criticism for the effective implemention of the methodology is that all the participants of a sys-

tem are prepared to enter into a free and open discussion about changes to be made. Privilliged participants of the system (in terms of wealth, status or power) have their dominant position and submit their privilliges to their own criteria (9). It is essential that the ability of some participants to impose sanctions on others, because of their power, must not affect the discussion which is inevitable in practice. In many social systems, whether at 'company', 'regional' or 'national' level, great inequalities exist, and the kind of unconstrained debate envisaged here cannot possibly take place. Since inequalities exist in the distribution of resources and power in societies, this methodology cannot be applied without the players showing a willigness to enter into free dialogue. If the social system has the oppurtinity for a reasonably full and open discussion, and if there is a balance of power and resources between participants the methodology can be used sucessfully (8). No society is 'equal' in the sense required by Checkland. In the case of Turkey these in equalities are very large. At this point, in time, 'soft' systems methodology is not appropriate to Turkey because participants in the present study do not have equal power to debate for feasible and desirable changes. Whereas it is essential that all actors have en equal say in discussion teachers and students do not have any right to affect the situation; only decision makers have this power.

The actors (teachers) here are not 'clients' who control the whole system or take any control action since regulations, legislations or sanctions are not under their control. It would be useful to see how far they could go in changing the system. they can only change things under their control that is in schools. Improvements of individuals' contributions to the system would have ensured a more effective remodelling of the problem situation. Of course, teachers want to improve their teaching conditions but if they are not responsible for the decision making which affects schools, it is not surprising that they do not feel 'ownership' of the project. In other words, teachers were willing but powerless. The hierarchy in administrative and professional bodies is rigid in Turkey and it is not practical for teachers to join the decision making processs. For this happen there would need to be some radical changes in the system.

2.1.6 Time Scale

The result of using this methodology is not of course a 'solution' to the original problem situation.

according to Checkland, problem solving in a human activity system is a continuing procesess, a procesess of learning which is never ending (5). Checkland states that one can start the analysis at any of the seven stages again and again understanding is enriched. Such multiple iterations require time, however. Time is not a limitation of the methodology but universal problem in educational research. Educational projects often however short life span. One can rearly go back and reinvestigate as Checkland requires. In this respect, present study is flawed, because of the researcher's time limitation it was impossible to proceed through the stages again and again operating the iterative model.

3. CONCLUSION

In conclusion, the research has provided a useful descriptive model of the CAL project. There has been a systematic evaluation of the processes of innovation and it is now possible to identify problem areas in the innovation procesess as applied to Turkey. The methodology, however, despite its original attractiveness and promise to capture a complex system, has provided difficult to operate in this educational context.

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