***Minireview Article***

# Chaos and Decision Making in Schools and Other Educational Institutions


## Abstract

Chaos is explained as complexity, instability, unpredictability, nonlinearity, and in the trash can model, conflicts, restrictions, differences, dynamic environment, instability of participation, complex organizations, and unstable conditions have importance. The garbage can model explains this tendency in organizations that often experience very high degrees of uncertainty.The aim of the current study is to discuss how the manager can benefit from the trash can model within the framework of their proactive personality in cases of chaos that may occur during the education management process. Within the scope of the current research, the following suggestions can be offered to education administrators: Creating a simple and flexible organization and organizational structure, giving importance to the detection of pre-learning and experiences (cognitive, emotional, motor, social aspects) in individuals, the need for education and school administrators to be proactive and behave accordingly.



***Key Words:****Chaos theory, educational institutions,organisational chaos, garbage can model*




## Introduction

## Organisational Chaos

Chaos, as a concept, is seen as a lack of order, disharmony, and complexity, as well as an unstable, unpredictable, and uncontrollable situation (Gleick, 1995).It is claimed that, especially in cases of dependence on initial conditions and chain events, very small changes at the beginning can cause large effects and results later.Chaos theory generally does not evaluate events and phenomena in a simple linear and cause-effect relationship (Altun, 2001). Chaos theory challenges to deal with unpredictability and indeterminism in human behavior (Cziko, 1999). Chaos theory has revealed that organizations should be perceived as organisms living in complex relationships rather than machines. Chaos is the result of non-linear and deterministic dynamic systems producing irregular and unpredictable behavior and extreme

sensitivity to initial values (Koçel, 2007).According to Gleick (1987; cited in Patton, 2014), some of the foundations and assumptions of chaos theory are as follows: not being based on a cause-effect relationship (non-linearity), the absence of a simple cause-effect relationship in a linear system. In school development efforts, despite linear organizational charts and development plans, schools are not linear systems, but chaotic systems. This situation leads to the fact that schools will not be managed from the top (Glickman, Gordon, & Ross, 2014). Sensitivity to initial conditions (butterfly effect), another basic principle of chaos theory, is known as sensitive dependence on initial conditions. According to chaos theory, a small and seemingly unconnected event occurring in one part of a system can have a huge impact on other parts of the system. A consequence of sensitive dependence on initial conditions is the impossibility of predicting the long-term future of a chaotic system. Similarly, it is impossible to predict long-term effects in school development. This means a unique type of planning is needed. Plans in schools should be short-term (1-2 years) rather than long-term (5-10 years) and focus on the process rather than the product (Patterson, Purkey, & Parker, 1986 as cited in Glickman, Gordon, & Ross, 2014).

In summary, the general principles contained in chaos theory are as follows.

- ✓ Not being based in cause-effect relationship (nen-linearity)
- ✓ Sensitivity to initial conditions (butterfly effect)
- ✓ Subsystems having the characteristics of the whole system (fractals)
- ✓ Feedback mechanism
- ✓ Instability in the system (turbulence)
- ✓ Unpredictable patterns (unusual attractors)

**Chaos in Educational Institutions**

Schools, which are social systems, are also complex structures. Many factors and variables (formal and informal groups, power structure of the environment) can affect the educational management process. Also, in education systems, the pre-learning/life experiences, readiness levels or entry behaviors of the educators and the students show that the need and importance of the starting conditions and their sensitive attachment to the starting positions should be taken into consideration. While each class can be considered as a pattern in educational environments, conflicts that occur or may occur also create turbulence situations (disorder, complexity, disorganization).In addition, the fact that graduates, who are the output of the

system, come back as input to the system and the inclusion of continuous measurement and evaluation in the teaching-learning process shows that the feedback and correction dimension is indispensable in educational management. Therefore, it is possible to say that schools contain the general characteristics of chaotic systems.

Experiencing very rapid changes and transformations, events not being based on a simple cause and effect situation, prior learning and experiences affecting the quality and outcome of the process, continuous measurement and evaluation of the results and process within the scope of feedback, the necessity and necessity of participation of all education stakeholders in managerial decisions, the system constantly experiencing entropy the state of a system tending to deteriorate and disorder over time (Verma, 2005)), considering the aspects such as the fact that the subsystems play an important role in determining the quality of the entire system, that the subsystems even carry the characteristics of the whole system, and that there are constant conflicts, it can be said that the education system and schools are completely chaotic environments.

The basis of self-recreating structures is the idea that a new order will emerge from chaos. While the chaos system disrupts its balance, it is possible for a situation to emerge in which it can reorganize itself, that is, it can recreate itself (Morgan, 1998). Naturally, chaos can present opportunities as well as a negative situation for organizations.

Cohen and his colleagues called this unstable situation “organizational anarchy.” According to the authors, organizations with organizational anarchy have basic characteristics such as problematic preferences, poorly structured technology, and unstable participation (Cohen et al., 1972). Considering the fact that managerial problems do not come to managers clearly, and ready for solution, the chaotic environment and/or situations that cause chaos must be handled with an approach and method in line with this understanding and solutions must be developed accordingly.One of the solution models suitable for situations in chaotic environments may be the Garbage Can Model.

According to the rational model, the decision-making process is generally divided into six parts: defining the problem, creating options, evaluating options, choosing between options, implementing the decision, and evaluating the decision. Few important decisions in management are simple enough to use the assumptions of the rational model (Robbins S., P. and Judge, 2012). Because many factors such as unclear problems, uncertainties, changing

and constantly developing internal and external environments, social structure and the values, norms, principles, uncertainties, conflicts that make up the social structure, individuals and their cognitive, emotional, social and physical characteristics affect the environment and organization. It can affect the management directly or indirectly, in positive or negative ways. All these situations that the organization and management have experienced or may experience should be handled with a unique approach, philosophy, understanding and method. In this context, the Garbage Can Model may be one of the approaches to be considered.

**Managerial Decision Making and Garbage Can Model**

Decision making occurs in response to a problem. This term points out the difference between the situation we are in and the situation we want to be in and the actions that need to be taken to reach this situation (Robbins and Judge, 2012). As a matter of fact, in organizational management, decision is to distinguish, discuss and choose (management's action is the result of its choices). Decisions are made rationally (identifying the problem, determining decision-making criteria, determining and evaluating alternatives, choosing the best alternative, implementation, reporting), within bounded rationality (a decision-making model that does not cover all aspects of the problem but takes into account its important features) or through intuition (based on.past experiences, feelings, emotions, unconscious mental processes, and culture).The managerial decision-making process also involves judging and taking precautions. In organizations, managerial decisions are made by the manager together with the employees (participants, those affected by the decision) or by the central management.

The garbage can model, which has important similarities with the bounded rationality approach used in organizational decision-making, was devised by Michael D. Cohen, James G. March and Johan P. Olsen (1972). It is stated that the model will give the expected results, especially if used in more complex organizations where information flow procedures are not clear and technology use is low (Lipson, 2004). The model is based on a number of assumptions. Namely, the choice and decision-making process in organizations is problematic and far from providing general satisfaction. Human behavior is not completely rational. There are technological problems in organizations. Most of the time, the processes carried out by the organization itself can be complicated and incomprehensible even for the employees. There is a variable participation process in organizations. Participants may change, which prevents continuity of management in the execution of any work in the subunits of the organization.

The existence of cross-relationships and the details of the organization's structure make the decision-making process difficult. There are multiple, unclear and conflicting goals. There are ways to achieve poorly understood goals and unstable participation in decisions.The starting and ending points of the process are not clear (Cohen et al. 2006). According to the garbage can model, when reaching decisions to solve a problem, organizations should not have an obligation to define the problem and then follow other steps, as decision-making approaches generally envisage. There are many contradictions and differences in organizations, just like in a garbage can. In this situation, which evokes an anarchic environment, decision makers/managers can actually start from the stage they deem appropriate for solution, choice and decision, without being bound to any process or sequence (Schermerhorn et al., 2004).

In businesses that are social organisms, problems, conflicts, restrictions, differences, groupings, solutions, participants, and choice opportunities should be able to flow independently of each other. Other reasons that require the application of the garbage can model may be as follows: Dynamic internal and external environment of the organization, variability of technology, conflicting demands and unclear goals, a structure in which the conflicts and differences of organizational members stand out, poorly structured information and communication technologies, reluctance to participate in decisions, complex, hierarchical and centralized organization and organization management, and instability of conditions.

In decision making according to the garbage can model, certain decisions are taken without following a regular way of thinking, reason and logic, without being examined, without determining cause and effect relationships, and without knowing whether they are practical or not. This decision-making model addresses the fact that there is no connection between the problems sought to be solved and the proposed solution methods, and in addition, the decision-makers' lack of interest and knowledge in the solution.

**Some Similarities of Chaos Theory and the Trash Can Model**

One of the basic principles of chaos theory, which is not based on a result relationship (non-linearity), is parallel to the principle of not having clear starting and ending points of the process advocated by the garbage can model. In the chaos and trash model, the organization is a dynamic environment. Naturally, the variables, expectations, structure, employees of the

environment, the organization, the structure and functioning of the organization affect the organization directly and indirectly.

There are similarities between the basic paradigms of chaos theory and the general features of the trash can model. Chaos theory features such as sensitivity to initial conditions (butterfly effect), subsystems carrying the characteristics of the whole system (fractals), feedback mechanisms, instability in the system (turbulence), unpredictable patterns (unusual attractors) are similar to the non-staged nature of the garbage can model.

Rational decision making for schools has many limitations. Using the rational decision-making model is a troubling choice for schools. Teaching technologies are diverse and poorly understood. Additionally, schools have multifaceted and conflicting purposes that are unclear and ambiguous. As a matter of fact, schools lack clearly defined success criteria. Therefore, problems and solutions cannot be translated into a rational decision-making model. Confusing problems, solutions, and decision participants often leads to decisions that do not fit the rational decision-making model set (Lunenburg and Ornstein, 2013).

**Results and Suggestions**

- ✓ A lean organizational structure (in which all unnecessary activities are identified and eliminated from the system) should be created (Danabaşoğlu, 1995).
- ✓ An organizational structure of flexibility (being in constant communication with the internal and external environment) should be created (Aldrich & Pfeffer, 1976).
- ✓ Since sensitive dependence on the initial state (butterfly effect) (Wheeler, 1989) is important, it is important in education systems to identify preliminary learning, readiness, entry behaviors (cognitive, emotional, motor, social aspects) and life experiences, and to complete and eliminate deficiencies. and should be given priority.
- ✓ Considering that in some chain events, small changes can lead to big problems (Gleick, 2000), all events, facts and situations related to students, teachers, management, office, environment, office work and transactions in education and school systems should be handled meticulously and taken into consideration.
- ✓ In accordance with the principle of non-linearity (Gleick, 1987), the relationship of problems in education and school systems with many different variables should be discussed and it should be noted that the results arise from many reasons.

- ✓ Some patterns are fractal and appear as self-similar structures (Gleick, 1987), in this respect, each subsystem of the education system can be considered as a fractal. For a school, each subsystem, namely the classroom, management processes, and management functions, can also be fractals. Each subsystem not only carries all the features of the upper system, but also has a fundamental role in the success of the upper system. The success, efficiency and necessity of the smallest unit and subsystem of education and school systems should always be taken into consideration.
- ✓ Turbulence means complexity, disorder, disorganization, imbalance, and conflict (Gleick, 1987). In education and school systems, this situation should not be seen as a state of anxiety and panic, but should be treated as an inevitable situation for living, vibrant organizations. Rather than ignoring, covering up, or pretending that conflicts and imbalances do not exist, the reasons that create conflict should be addressed and energy should be spent on how to manage them.
- ✓ Rather than identifying faulty people, the education manager should focus on solutions, develop various strategies for chaotic situations, include stakeholders in the management process, provide opportunities and environments for different opinions. They should not ignore chaotic situations, instead they should have data, act fairly, and use all communication channels.
- ✓ School principals should have a proactive personality or develop themselves towards it. Many positive qualities are emphasized in the literature for the proactive personality trait. A proactive personality includes being patient, influencing environmental change, looking for opportunities, taking initiative, being able to take action, being a pioneer of change, challenging the status quo, leading behaviors, focusing on the future, bringing changes to actions when necessary or changing oneself, improving oneself, cinnecting with individuals, shows perseverance in the face of obstacles, seeing and seizing opportunities, turning problems into opportunities, having the power to make constructive changes, questioning the current situation, tackling problems, looking for new alternatives, being responsible, having creative ideas, trying to do the best, looking for ways to do things and being innovative (Bateman & Crant, 1993; Bindl & Parker, 2010; Crant, 2000; Eby & Reeves, 2006; Grant & Ashford, 2008; Lambert, Seibert, Kraimer, & Crant, 1999; Seibert, Kraimer, & Crant, 1999).

- ✓ School principals and members should produce alternative solutions, take important features of the problems into account by simplifying them, and include their intuition in the decision-making process.
- ✓ School principals and school members should thoroughly analyze the situation and conditions in decision situations, get to know the organizational culture, pay attention to misconceptions and prejudices, combine rationality and intuition if possible, increase productivity, pay attention to organizational and environmental obstacles and try to minimize them.
- ✓ As the garbage can model advocates, there may be problems, conflicts, restrictions, differences, formal and especially informal groups in educational organizations, just like other organizations that are social organisms. For this reason, most of the time, a linear path may not be followed in solving the problems encountered. It can be started from a different stage in solving the problem (such as starting directly from the solution). Especially in emergency situations, situations of crisis and chaos, and in situations and environments that require security measures, decisions may be taken for direct and immediate solutions rather than rational decision steps.
- ✓ In one aspect, the garbage can model emphasizes that the manager should act situation-specific, make decisions, develop solution alternatives, and even stay ahead of problems and problems (take measures, suggest solutions, develop scenarios before problems, crises and problems occur).
- ✓ In the twenty-first century, education and school systems, whose internal and external environments are increasingly complex, chaotic and uncertain, may prefer the garbage can model, especially at the administrative stage. For this, they can include informal groups in the decision-making process, develop various game theories, and act strategically. However, in order to do all this, it is necessary to act systematically in education and school organizations, use information and communication technologies, master the data, and establish a healthy communication and interaction system.

**References**

Aldrich, H.E. & Pfeffer, J. (1976). "Environments of Organizations", *Annual Review of Sociology*, *2*, 83-91

Altun, S. A. (2001). Chaos and management. Educational Administration in Theory and Practice, 28(28), 451-469.

Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior*, *14*(2), 103- 118.

Bindl, U. K., & Parker, S. K. (2010). Proactive work behavior: Forward-thinking and change-oriented action in organizations. *APA Handbook of Industrial and Organizational Psychology*, *2*, 567-598.

Cohen, M. D., March, J. G.,&Olsen, J. P. (1972). A garbage can model of organizational choice, *Administrative Science Quarterly*, *17*, 1.

Crant, J. M. (2000). Proactive behavior in organizations. *Journal of Management*, *26*(3), 436.

Cziko, G. A. (1999). Unpredictability and indeterminism in human behavior: arguments and ımplications for educational research. *Educational Researcher, 18*(3), 17-25.

Danabaşoğlu, B. (1995). Lean production system versus agile production system, Automation Journal, 72.

Gleick, J. (1987). Chaos making a new science. New York: Yiking Penguin Inc.

Gleick, J. (1995). Kaos: Yeni bir bilim teorisi, Ankara: TÜBİTAK Popüler Bilim Kitapları

Glickman, C. D., Gordon, S.P., Ross,J.M. (2014). Denetim ve Öğretimsel Liderlik (Çeviri Editörleri: Mualla Bilgin Aksu, Esmahan Ağaoğlu). Ankara: Anı Yayıncılık.

Grant, A. M., & Ashford, S. J. (2008). The dynamics of proactivity at work. Research in organizational behavior, 28, 3-34.

Koçel, T. (2007). Business Management, Istanbul: Arıkan Press.

Lambert, T. A., Eby, L. T., & Reeves, M. P. (2006). Predictors of networking intensity and network quality among white-collar job seekers. *Journal of Career Development*, *32*(4), 351-365.

Lipson, M. (2004), A Garbage Can Model of UN Peacekeeping" The Annual Meeting of the Canadian Political Science Association, 3-5 June 2004, Winnipeg, Manitoba.

Lunenburg F. C. & Ornstein, A. C. (2013). Educational Administration (Eğitim Yönetimi Çeviri Editörü: Gökhan Arastaman), Ankara, Nobel Yayınları 6. Baskı.

Morgan G. (1998). "Yönetim ve Örgüt Teorilerinde Metafor", G. Bulut (Çev), İstanbul: MESS Yayınları.

Patton, M. Q. (2014). Qualitative Research and Evaluation Methods (Translation Editors, Mesut Bütün, Selçuk Beşir Demir). Ankara, Pegem A Academy. Robbins S., P. & Judge, T. A. (2012). Organizational Behavior, (Translation Editor: İnci Erdem) Ankara, Nobel Publications 14th Edition.

Robbins, S. P. (1991), Essentials of Organizational Behavior, Prentice Hall Inc.

Schermerhorn, J. R., Hunt, J.G. & Osborn, R. N. (2004), Organizational Behavior, 9. Edition, London: John Wiley & Sons.

Seibert, S. E., Crant, J. M., & Kraimer, M. L. (1999). Proactive personality and career success. Journal of applied psychology, 84(3), 416-427

Verma, S. (2005). "Little Book of Scientific Principles" Ankara: TUBITAK Popular Science Library no.723,2005.

Wheeler, D.D. (1989). Problems with chaotic cryptosystems. Crvptologia. XIII(3), 243-250.