DEPÓSITO LEGAL ppi 201502ZU4666
Esta publicación científica en formato digital es continuidad de la revista impresa
ISSN 0041-8811
DEPÓSITO LEGAL pp 76-654

Revista de la Universidad del Zulia

Fundada en 1947
por el Dr. Jesús Enrique Lossada

Ciencias Sociales y Arte

Año 10 N° 28
Septiembre - Diciembre 2019
Tercera Época
Maracaibo-Venezuela

The effect of system engıneerıng model on school management

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ABSTRACT

This article emphasizes the necessity and importance of system engineering in the field of education. The problems related to education in the field of system engineering and the necessities in the field of education are discussed. Nowadays, many institutions and organizations have developed systems engineering in order to simplify the projects to be carried out in the field of education for it to be high quality and less costly. In order to meet the needs of the public and private sectors, system engineering is very important and the demand towards it in the academic field is increasing day by day. In this context, the necessary changes to be made in the field of education, inputs and outputs to be done, if any, to reach the solution of the problems or to make improvements are among the aims of the system engineering. This research is done to reveal the opinions of teachers and managers and their past experiences in such cases. Pre-test and post-test were applied in the study and the results were evaluated. The field of system engineering is still young and dynamic and will be recognized more and more over time and will be implemented both in organizations and training.

KEYWORDS: education programs, system engineering, system engineering education, competitive system

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Recibido: 07/11/2019 Aceptado: 11/12/2019

El efecto del modelo de ingeniería del sistema en la gestión escolar

RESUMEN

Este artículo enfatiza la necesidad e importancia de la ingeniería de sistemas en el campo de la educación. Se discuten los problemas relacionados con la educación en el ámbito de la ingeniería de sistemas y las necesidades en el campo de la educación. Hoy en día, muchas instituciones y organizaciones han desarrollado ingeniería de sistemas para simplificar los proyectos que se llevarán a cabo en materia de educación para que sea de alta calidad y menos costosa. Para satisfacer las necesidades de los sectores público y privado, la ingeniería de sistemas es muy importante y la demanda en el espacio académico aumenta día a día. En este contexto, los cambios necesarios que se deben realizar en educación, los insumos y productos que se realizarán, si los hay, para llegar a la solución de los problemas o para realizar mejoras, se encuentran entre los objetivos de la ingeniería del sistema. Esta investigación se realiza para revelar las opiniones de maestros y gerentes y sus experiencias en tales casos. Pre-test y post-test se aplicaron en el estudio y se evaluaron los resultados. El campo de la ingeniería de sistemas es aún joven y dinámico y será reconocido cada vez más a lo largo del tiempo y se implementará tanto en organizaciones como en capacitación.

PALABRAS CLAVE: programas educativos, ingeniería de sistemas, educación en ingeniería de sistemas, sistema competitivo

Introduction

System engineering is an engineering field that focuses on how to design complex systems that we encounter during our lives. In general terms, engineering consists of many disciplinary subjects such as designing, developing these designs, providing reliability, logistic application, the need for coordination of different teams, testing and evaluating them (Giachetti, 2010).

System engineering is often used in large projects. In these projects, it deals with business processes, optimization methods and risk management tools. There are multiple branches of technical and people-oriented disciplines such as industrial engineering, mechanical engineering, production engineering, control engineering, software engineering, electrical engineering, cybernetic, organizational studies,

engineering management and project management. It also helps addresses all possible aspects of projects or systems (Goodeh and Machol, 2014).

The system engineering process is a very different discovery process than the production process. A manufacturing process focuses on repetitive activities that produce high quality outputs with minimum cost and time. When this process is being applied, it should discover the real problems that need to be solved, and identify the most likely or greatest impact that can occur. System engineering seeks solutions to these problems (Haines, 2010).

The system contains the human factor: the word 'system' is opposed to the scientific branch because the academic departments of the Industrial Engineering are generally in larger areas (physics and human factor, manufacturing development, judgment research, management engineering, etc.). The word 'systems' is generally sharp. Even some words related to industry do not fully define what industrial engineers do. In this way, System Engineering and Industry can be reached to companies, hospitals, insurance and so on.

The term system engineering can be returned to Bell Telephone Laboratories in the 1940s. The need to define and modify the characteristics of a system that can differ greatly from the sum of the components in complex engineering projects has been motivated to mobilize emerging systems for various industries, particularly US Military Systems.

System engineering for the management project forces the manager to focus on objects and targets of the project. Project managers focus on understanding the main ideas of systems, their differences between long-term and short-term goals and making strategic decisions on long-term goals. Life cycle developments and project management writing occur by project engineering in systematic thinking (Carles, 2007). Another view in system engineering is that engineering design which is the focal point. In this approach, 'complex' design organizes different alternatives from different angles. The system engineering approach has been focused on many changes within the framework of providing data ", designed on different alternatives and many options. Mathematical, statistical, quantitative techniques provide the control of product

design and product management. The concept of design also emphasizes management engineering and takes into account the calculation risks in its decisions (Carles, 2010).

Educational engineering emerged in the 1980s and as mentioned below, these developments were also emphasized in secondary and higher education institutions.

- The search for high qualifications in engineering curricula can be considered as an indicator of the decrease in interest in engineering careers in secondary education students. In the next decade, there must be high expectations and qualifications to meet the needs of the industry.
- Having graduated from engineering, they have begun to complain because they have been thrown into working life and have new business elements, high level of solution skills, communication and teamwork skills, engineering understanding and commercial practices (Çağlayan, 2014).
- It is taught that in the field of traditional conferences where the science of intelligence and comprehensive educational research is repeated, effective progress learning and high level of skill development should be reinforced in engineering education.
- In the United States, mostly coming from European countries, Washington Accord, has received and signed the equivalence certificate of these 'program based on external branches'. These systems have been concentrated on displaced documents of equivalence, it has been assigned to students and it has been taught to find remedies in short falls of target learning from outside (Çalık et al. (2011). The technology has been applied in goods, in the specified potential and in distance education.
- Over the next decade, university administrators and faculty have become aware of the development of traditional engineering works. This development will be in the form of either service from computers or engineers working in the country for a cheap fee (Çalık et al. 2011).
- In order for the future engineers to be successful, the competitor is an engineering education curriculum; In this curriculum, it will be given importance to the future engineering curriculum with the materials needed by engineers as well as skills to use these materials, critical and creative thinking.

Engineering education development is slow in response to all pressures from the engineering training committee. If you walk down the corridors of the buildings of the engineering departments of many universities, and look at the classes of many universities, you will see that professors are training in the same way as in the same subjects as they were ten years ago. However, dramatic differences appear in some institutions, not in all universities.

Based on his own experiences, Felder mentions the existence of two paradigms in engineering education. Traditional education is dominated by at least a century. Another one is innovation and updating. In Felder 's article, the first draft was thought of as two schools and the opposing positions were published in four ways. These are;

1) How should curricula be ranked?

2) How to teach lessons in classes?

3) Who should teach?

4) How should the staff prepare themselves for teaching?

What Felder wants to present is not to discuss the historical perspective, the use of traditional methods, and the question of updating, and creating an innovative behavior. There is a purpose of creating a new method of education by taking the sum of these. In this study on application of system engineering to American educational systems; To implement system engineering methods into a complex human system is unorthodox and dynamic modeling of the system is required. This research; was organized as a student project with competing teams. The complexity of US education systems necessitated the examination of the whole system and then focused on a limited part. In the recent past, system engineering has been applied to systems where most systems are outside the control of the system designer. It is a complex social system in terms of the number of people and the number of its components. Even though system dynamics modeling has been applied to educational systems worldwide, none of the examples included dynamic modeling of the US education system. However, in most of the system engineering process, the steps used in the education system follow the standards and in the last 50 years they have benefited from the best practices of system engineering developed by the community (Cabrera and Cabrera, 2015).

At the lower graduate level, only systems that can be held in schools are clearly visible. However, they want to be aware that the number of teachers increasing, students disciplinary projects would be beneficial. The comprehensive existence of the curriculum is also at the secondary school level. Today, in secondary school there are problem-based curriculum experiences for this project. It placed great importance on the content of learning. Examples of content; complex but interesting problems such as negotiation, face, climate, health, energy or penetration, etc. are issues. Calculations of student performances in school systems were used in STEM careers approach (Gür, 2006).

New methods were developed to address direct complexity when it was no longer possible to rely on design development to improve a system, and when existing tools were not sufficient to meet the growing demands. The continuing evolution of system engineering involves the development and identification of new methods and modeling techniques.

In 1990, a professional community for system engineering, the National Council for Systems Engineering INCOSE, was formed by representatives of a number of US companies and organizations. INCOSE has been created to meet the needs for system engineering applications and to improve education. As a result of the increasing participation of system engineers outside the United States, the name of the organization was changed in 1995 to the International System Engineering Council (INCOSE).

Hence, schools in many countries have offered graduate programs in the field of system engineering and these programs are still ongoing. There are also training options for practitioner engineers (Gür, 2006). System engineering means an approach and also engineering discipline. The purpose of education in system engineering is to simply formalize various approaches and in doing so identifying new methods and research opportunities in other engineering areas. As an approach, system engineering is holistic and interdisciplinary (Haines, 2015). The scope of traditional engineering includes the concept, design, development, production and operation of physical systems. Initially designed system engineering is within this scope. In this sense, system engineering refers to a distinctive set of concepts, methodologies, organizational structures (and the

like) developed to meet unprecedented size and complexity, effective functional systems and engineering challenges over time; The Apollo program is one of the leading examples of a system engineering project (Haines, 2010).

1. Expanding the Concept of System Engineering and Its Holistic View

The use of the term system engineers has been developed over time to adopt a more comprehensive, more integrated concept of system and engineering processes. This evolution of definition is the subject of an ongoing debate, which is both narrow and broad. Conventional system engineering was seen as a branch of engineering in the classical sense, ie applied only to the physical system such as spacecraft and aircraft. More recently, system engineering has been developed to gain a wider meaning, especially when people are seen as an indispensable part of a system.

Three types of system engineering have been defined in accordance with the broad scope of system engineering within System Engineering (SEB): (Haines, 2010).

1. Product Systems Engineering (PSE) consists of traditional system engineering hardware and software that focuses on the design of physical systems.
2. Institutional System Engineering (ESE) is related to the appearance of the systems of the enterprises, ie organizations.
3. Service Systems Engineering (SSE) is related to the engineering of service systems. Checkland describes a service system as a system serving to another system. Most are civil infrastructure service systems.

System engineering addresses the system life cycle, which is a problem when analyzing and uncovering customer needs that requires functionality at the beginning of the development cycle, documenting the requirements, designing synthesis and setting system validation. This includes a full understanding of all relevant stakeholders (Hybertson, 2009).

System engineering can be divided into 2 different processes;

- Technical Process of Systems Engineering
- System Engineering Management Processs

1.1. Interdisciplinary Area, Development and Barriers in terms of Systems Engineering

In order to improve the system, usually the contribution of different disciplines is needed. By providing a systematic (holistic) perspective, system engineering helps all technical contributors to move from mold to construction within the unified team. This results in termination, production and operation. In a procurement process, the holistic integrative discipline combines its contributions. It is considered to cover the whole life cycle of the goods while maintaining a level of risk, by swaps making up the balance between cost, timing and performance (Hollnagel and Woods, 2005).

The system engineering courses are taught by the faculty members of other engineering departments because this perspective is replicated in educational programs. It helps to create an interdisciplinary environment (Hollnagel & Woods, 2010).

Moreover, it includes two or more academic disciplines in an activity (eg a research project). This is about creating something new by crossing the boundaries. This is related to the interdisciplinary field, an organizational unit that transcends traditional boundaries between academic disciplines or schools of thought as new needs and professions emerge. A large engineering team is often interdisciplinary (Martin, 2007).

The interdisciplinary term is applied to describe the work that uses the methods and insights of certain disciplines or traditional fields of study within educational and teaching pedagogies. Interdisciplinary researchers, students and teachers include a number of academic thinking. Professions, or technology schools (with specific perspectives) aimed at pursuing and integrating a common task (Mele et al., 2010). Interdisciplinary is often seen as the twentieth century term. Furthermore, it has been claimed that any expanded humanist project involves interdisciplinary. Interdisciplinary programs sometimes arise from a common belief that traditional disciplines cannot address an important problem. For example, social sciences such as anthropology and sociology do not pay much attention to the social analysis of technology in most of the 20th century. As a result, many social scientists are interested in technology participate in science, technology and community programs. These

programs are usually attended by academics from numerous disciplines (Michael, 2009).

Interdisciplinary research is also the key to health science research. Some higher education institutions offer accredited degrees and programs in interdisciplinary studies. The combination of quantum physics and computer science with bioinformatics is the integration of molecular biology with computer science (Michael, 2009). Most of the interdisciplinary interventions need to learn to appreciate different perspectives and methods as they are educated in traditional disciplines. For example, a discipline that places greater emphasis on quantitative "rigor" can make practitioners think of themselves (and their discipline) more "scientifictly" than others. Colleagues in "soft" disciplines can associate quantitative approaches with an inability to grasp the broad dimensions of a problem. An interdisciplinary program may fail when members stay in their own disciplines (and in disciplinary attitudes). On the other hand, a multidisciplinary study in terms of "soft" discipline can be seen as rigid or not ideologically motivated. These beliefs are an obstacle in the career path of those who choose to work in interdisciplinary field (Michael, 2007). Interdisciplinary programs may fail if not given an adequate autonomy. For example, the interdisciplinary faculty is recruited with a joint appointment that is responsible for both an interdisciplinary program (such as women's work) and a traditional discipline (such as history) (Michael, 2007).

1.2. System Engineering Interdisciplinary Studies and Defense Opinions

In interdisciplinary studies, questions arise about how the interdisciplinary study works, the nature and history of disciplinarity and the future of knowledge in the post-industrial society. The most common complaint about interdisciplinary programs is the lack of synthesis by promoters and detractors, ie providing students with multiple disciplinary perspectives. However, there is no effective guidance in the resolution of conflicts and a consistent view is not obtained (Michael, 2007).

Although much has been written about the promise of the philosophy of interdisciplinarity in academic programs and professional practice, social scientists are

increasingly questioning the interdisciplinary academic discourse and the interdisciplinarity.

An article in the Journal of Social Science attempts to provide a simple and discreet definition of interdisciplinarity by eliminating the need for concepts such as interdisciplinary and multidisciplinary by passing the difficulties of defining this concept (Oliver, 2015).

"At first, discipline is relatively self-contained, with its own community of expertise, and easily identified as an isolated field of human experience: Interdisciplinary is seen as bringing together the distinctive components of two or more disciplines. In academic discourse, interdisciplinary is often applied to four areas: knowledge, research, education and theory. Interdisciplinary knowledge involves familiarity with the components of two or more disciplines. Interdisciplinary research combines the components of two or more disciplines in new knowledge, processes or artistic exploration or creation (Oliver, 2015).

On the other hand, any information, regarding the interdisciplinary richness of research or education, can be listed in four order by measuring the distance between them in terms of the innovation of any combination and their degree of integration.

Interdisciplinary knowledge and research is important because;

1. Creativity often requires interdisciplinary knowledge.
2. Immigrants often make significant contributions to their new field.
3. Disciplines often take on errors that can be detected by people who are familiar with two or more disciplines.
4. Some valuble research topics, falls into gaps between traditional disciplines.
5. Many intellectual, social and practical problems require an interdisciplinary approach.
6. Interdisciplinary knowledge and research serve to remind us of ideal knowledge.
7. Disciplines have more flexibility in their research.
8. The discipline experts consider themselves much more equivalent in doing intellecutual research in new areas than the narrow disciplines.

9. Disciplines can help transcend the gaps in communication in the modern academy. Thus, it can help to mobilize immense intellectual resources in the name of greater social rationality and justice.
10. Partitioned disciplines can play a role in defending academic freedom of interdisciplinary individuals by building bridges (Raton, 2011).

1.3. Managing Complexity in System Engineering

The need for system engineering has arisen with the increasing complexity of systems and projects. For this reason, the possibility of the component has increased and therefore, it increased the unreliability of the design. In this context, the complexity includes not only the engineering systems but also the data of logical human organization. Nevertheless, a system may become more complex due to it's size, and an increase in the number of data, variables, or areas associated with design (Hoverstadt, 2009).

Development of smarter control algorithms, microprocessor design and analysis of environmental systems are also in the field of system engineering. System engineering encourages the use of tools and methods to better understand and manage complexity in systems. Some examples of these tools are given below (Hoverstadt, 2009);

- System architecture,
- System model, Modeling and Simulation,
- Optimization,
- System dynamics,
- System analysis,
- Statistical analysis,
- Reliability analysis
- Decision

The engineering systems approach is inherently a part of the complex behavioral system components. However, the interaction is not always clear and well-defined. It is one of the objectives of engineering systems to identify and characterize these systems and subsystems.In doing so, the gap between unregistered requirements

between users, operators, marketing organizations and technical specifications has been successfully bridged (Demirtaş, 2005).

One way to understand the motivation behind system engineering is to see this as a method or practice to identify and develop common rules in a wide variety of systems. With this method in mind, the principles of system engineering have been determined as integrity, emerging behavior, boundaries and others. System thinking can be applied to any complex or other system provided that it is employed at all levels. Other than defense and aviation, many information and technology based companies, software development firms and industries in the field of electronics and communications can use system engineers as part of their teams (İhtiyaroğlu, 2014).

It has been analyzed by the Center for Excellence in Systems Engineering (SECOE). It shows that the best effort for system engineering is about 15-20% of the total project. At the same time, studies have shown that system engineering mainly leads to a reduction in costs among other benefits. However, until recently there has not been a large-scale quantitative research involving a wide range of industries. Such studies are under way to determine and measure the benefits of system engineering (İhtiyaroğlu, 2014).

System engineering encourages the use of modeling and simulation to verify the assumptions or theories of systems and their interactions. The use of methods that provide early detection of potential failures in safety engineering is integrated into the design process. At the same time, the decisions made at the beginning of a project whose results cannot be clearly understood can have a huge impact on the life of a system. The mission of the modern system engineer is to explore these issues and to make critical decisions. Today's decisions do not gurantee that these will be valid when the system first becomes operational in the years after its envision. However, there are techniques supporting the system engineering process (Jackson, 1991).

1.4. Education on System Engineering

In system engineering education, engineering students have a basic background in traditional engineering disciplines (eg aeronautical engineering, civil engineering, electrical engineering, mechanical engineering) which is considered to be an extension

of regular engineering courses that reflect industry attitudes. Systems engineering undergraduate university programs are rare. Typically, system engineering is offered at the graduate level with interdisciplinary study (Jenkins, 2007).

INCOSE maintains a constantly updated System Engineering Academic Programs Directory used worldwide. As of 2009, there are about 80 institutions offering 165 undergraduate and graduate programs in system engineering. System engineering training can be taken as System-centered or Domain-centered.

- System-centered programs treat system engineering as a separate discipline. Most of the courses are taught by focusing on the principles and practices of system engineering.
- Domain-based programs offer a system engineering that can be used in another area of engineering.

Both of these patterns attempt to train system engineers, who can supervise interdisciplinary projects at the depth required by a core engineer (Jenkins, 2007). System engineering tools are strategies, procedures and techniques that help system engineering applications on a project or product. The purpose of these tools is database management, graphic scanning, simulation and logic, document production and neutral import / export.

1.5. Using Systems Engineering Models

These models play important and different roles in system engineering. A model can be defined in several ways:

- The abstraction of reality designed to answer specific questions about the real world,
- The imitation, similarity or representation of a real world process or structure,
- A conceptual, mathematical or physical tool to assist the decision maker.

Together, these definitions are broad enough to encompass schematic models such as functional flow, block diagram and mathematical (ie, quantitative) models used in

the trade process, as well as physical engineering models used to validate a system design.

The main reason for using mathematical models and schemas in trade studies is to provide system efficiency, performance or technical qualifications, cost estimates from a range of known or predictable amounts. Typically, a collection of separate models is needed to provide all of these result variables. The heart of any mathematical model is a series of significant quantitative relationships between inputs and outputs. These relationships can be as simple as gathering constructor quantities to obtain the sum, or are complexed as a series of differential equations that define the orbit of a spacecraft in a gravitational field. Ideally, relationships are not just correlation, but also causality (Jenkins, 2007).

In addition, the key to successful system engineering activities is the way in which these models are managed efficiently and effectively and used to simulate systems. However, various areas are usually experiencing modeling and simulation problems for system engineering and new advances aim to use the methods between different scientific and engineering communities under the title of 'Modeling and Simulation Based Systems Engineering' (Jenkins, 2007).

2. Method

This research is done qualitatively to emphasize the necessity and importance of system engineering in the field of education and state the problems related to it. Pre-test and post-test were applied in the study and the results were evaluated. The sample of the research is selected from the managers, teachers and students working in primary schools in Nicosia in the academic year of 2018/2019 and were selected by simple random sampling technique. They were marked as managers, teachers and students on the table when writing the data.

2.1. Workıng Group

This research was conducted with 60 participants. The gender distribution of the participants (67%) was male and eleven (33%) were female.

2.2. Development of data collectıon tool

In the first section of this research quantitative analysis is done to note down the findings of the demographic information belonging to the sample group with the results obtained and in the second section; qualitative data analysis is done to write down the elements to be considered in the formation of an action plan. Arranged times were given to participants and the research participation was done on voluntary basis. Once the data was collected evaluation and analysis were written. Finally, discussion was added and suggestions were made.

2.3. Analysıs of data

2.3.1. Analysing of Interviews

The questionnaire was preferred as the data collection method and all participants were informed about the procedure of the data collection. After the data was collected, the results were analysed and evaluated.

3. Results

In this part of the study, the findings of the demographic information belonging to the sample group and the results obtained by the analysis of the data obtained for the sub-problems of the researcher with the appropriate statistical method are included and comments on these findings are given. Below, the pre-test and post-test results that are applied in the seminars and held in different topics within the scope of the research are separately expressed in tables.

1. Personal Information
A. Quantitative Data Analysis:
Table 1. Gender distribution of participants

Gender	Frequency	Percentage
Women	40	67
Men	20	33
Total	60	100

In Table 1, the gender distribution of the participants (67%) was male and eleven (33%) were female.

Table 2. Marital Status of Participants

Marital Status	F	%
Married	50	84.4
Single	10	16.6
Total	60	100

In Table 2, it can be seen that 84.4% of the respondents were married and 16.6% were single.

Table 3. Frequency distribution by position

Position	F	%
Manager	24	37,5
Teacher	31	50
Student	5	12,5
Total	60	100

As seen in Table 5; 37.5% (24) of the individuals who participated in the research were managers, 50% (31) teachers and 12.5% (5) were students.

2.Pre-test and Post-test Findings

A: Qualitative Data Analysis

Question 1. Elements to be Considered in the Formation of an Action Plan.

Table 4. Stakeholders attention in developing action plan according to participants

	Manager		*Teacher*		*Student*		*Total*	
Theme	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Students getting training in institutions	13	%86.6	18	%90	4	%80	35	%87.5

Teachers found in institutions	12	%80	15	%75	3	%60	30	%75
	8	%53.3	9	%60	4	%80	21	%52.5
Employees at schools	12	%80	14	%70	1	%20	27	%67.5
The individuals found at the region the school is located	12	%80	14	%70	2	%40	28	%70
Partners contributing to action plan								

Participants' opinions;

As in all business areas, there are points to be taken into consideration when creating action plans in institutions within the field of education. One of the most important of these is the selection of school circles and targets (D1).

When creating an action plan, the school areas where students can spend time and the social areas close to the schools should be taken into consideration (O11).

Question 2. Factors to be Considered in the Formation of an Action Plan.

Table 4. Elements to be considered in the action plan according to the participants

Participants' opinions;

As in all business areas, there are points to be taken into consideration when creating action plans in institutions within the field of education. One of the most important of these is the selection of school circles and targets (D1).

When creating an action plan, the school areas where students can spend time and the social areas close to the schools should be taken into consideration (O11).

As seen in Table 2; Participants stated that the region where the school is located environmental and social conditions are the most important point to be taken into consideration when creating the action plan. Moreover, the group of administrators and teachers stated that it is important to use this data in order to obtain proper and healthy data and to organize the action plan accordingly. In addition to this, the administrators say that the administrators are of the opinion that a high rate of 79%, teachers with a ratio of 70% and a 40% participant profile in the other group should be well defined in their study plans and targets.

A. Management Processes of School Stakeholders Evaluation of Seminar Studies Pre-Test Questions.

Question 3. The place and importance of team spirit in school management.

Table 5. The place and importance of team spirit in school management, according to participants

	Manager		*Teacher*		*Student*	
Theme	***N***	***%***	***N***	***%***	***N***	***%***
To work efficiently	12	%80	7	%35	1	%20
Every individual owning the purpose and being more willing		%33.3	10	%50	3	%60
Learning to share and do innovations in the name of sharing	10	% 66.6	3	%15	3	%60

Participants' opinions;

Working areas should have a comfortable and peaceful environment. This peaceful and comfortable working conditions can be achieved with team spirit (Y7).

In order to ensure team spirit, all officials and stakeholders should adopt the common goal and be willing to work for that purpose (O 14).

As shown in Table 5; A large majority (80%) of the administrators who participated in the research stated that they considered the importance of team spirit in school management in order to work efficiently. In addition, it is seen that the majority of the teachers (50%) who participated in the project had the idea that the place and importance of team spirit in the school management could contribute to the individual's willingness to participate. Other individuals (60%), stated that they thought in the way as teachers, and that they also thought that it was important for them to learn and share innovations.

Management Processes of School Stakeholders Evaluation of Seminar Studies Post-Test Questions.

Question 4. The importance of project.

Table 6. The importance of project according to the participants.

	Manager		*Teacher*		*Student*	
	N	*%*	*N*	*%*	*N*	*%*
Theme						
To develop and improve projects are an important step.	8	%52,8	8	%40	3	%60
	4	%26,6	14	%70	5	%100
To be able to apply innovations for being different in the field.	7	%46.2	6	%30	2	%40
It is important to have updating and building a productive structure.						

Participants' opinions;

The creation and realization of projects is an important step to develop (Y14).

Projects are of great importance in order to create innovations and to make a difference (O17).

As seen in Table 6; The majority of the administrators and teachers who participated in the research indicated that the subject of the project has the importance in developing those projects. However, it is seen that the teachers stated that the projects are important for being able to carry out innovations more in a different way and to be one step ahead of their rivals. It is seen that the other participants completely agree with this idea and share the same thoughts with the teachers.

Question 5. Contribution to school management in the study of entrepreneurship and human nature.

Table 7. Examination of entrepreneurship and human nature and their contributions to school management according to the participants'

	Manager		*Teacher*		*Student*	
	N	*%*	*N*	*%*	*N*	*%*
Theme						

To be hungry for success	6	%39.6	6	%30	2	%40
Interpersonal harmony	12	%79.2	11	%55	2	%40
Motivation and progressive vision	2	%13.2	17	%85	4	%80
Innovative thinking ability	4	%26.4	9	%45	1	%20

Participants' opinions;

The successful performance of school management will affect the harmony and motivation of the individuals working in the institution (O17).

Entrepreneurship is one of the most fundamental feelings that are inherent in man. This brings a sense of hunger for success and innovation (O 16).

As shown in Table 7; we can conclude that the examination of the spirit of entrepreneurship and human nature will contribute to school governance. A large part of the teachers and administrators can contribute to the strengthening of the school management's ideas about the development of entrepreneurship and the development of interpersonal relations.

4. Discussion

This study aims to investigate whether the system engineering model applied in schools has an impact on school management and education.

When we look at the views of the participants in preparing an action plan, we can see that we have two questions here. The first one to be taken into consideration when preparing the action plan is the stakeholders. The participants emphasized that the most educated students should be taken into consideration. The theme most closely related to this theme is that teachers taking part in institutions should be taken into consideration. When we look at the other items that are to be considered, we can see that the environment and social conditions in which the school is located are an important criterion. It is the most critical element to avoid any structure and other situations that may pose a threat to students in the school environment.

According to the participants, the place and importance of team spirit in school management is indicated by the theme of being able to work most efficiently. Following

this, the participants stated that team spirit is important in order to bring new ideas to the individual by adopting the common goal and learning to be willing and sharing. When we look at the work carried out by Demirtaş (2005), we can see that team work can be handled as a fruit of cooperation, management practices, team work by thinking together on specific problems, creating solutions, solving the problem, ensuring and maintaining the change and renewal. When we consider this, it will be self-evident how important this is for schools. The success of the work done by each of the employees in the schools depends on the success of the other employees as it is found in the findings. In other words, schools should work with team spirit in order to be effective.

When participants are asked about the importance of producing projects, it has been found as the most common theme to implement innovations and to be different in the field. Apart from this, the themes that the participant's views give us is to develop and developing f-projects are important in order to have a productive structure. When we look at the literature of Dede and Yaman (2003) it is possible to see the similar results. As a result of this study, we can see that the projects are more willing, concentrated and open to development. With the help of these projects, students can also have a productive structure.

When the findings of the participants about entrepreneurship and the nature of human beings are examined, it is seen that the inter-individual adjustment is effective. Here, the main point to be seen is the harmony between individuals and when individuals make an attempt, there are situations where they wary of other individuals or they do not hesitate. Apart from this, being open to success, motivation and progressive vision along with innovative thinking ability themes are included. When we look at the literature, Köybaşı and Dönmez (2017) did, it has been found that the school administrators and entrepreneurs can help the organizations to run without interruption, but they can give positive results in terms of opening the way for innovation and success. By organizing school activities according to changing environmental conditions, the school can renew itself with innovative ideas.

Conclusıon

The idea of engineering system has emerged as a result of an attempt to evaluate the theories developed for all branches of science. The concept of the system is composed of specific sub-units that are associated with each other and their environment, with the function of performing a purpose together; as a whole associated with its environment and as part of it. The concept of the system can provide an easier understanding of the cases and events examined, and can be applied to all. With such an approach, any structure, event, activity and concept that is composed of unified and integrated parts can be considered as a system. The system approach makes it possible to see all variables that form and affect the organization. It can be said that the most important feature that differentiates system theory from classical theories is its emphasis on organizational and environmental interaction.

In this study, it is seen that the positive rate is higher when the school is sharing organizational culture, student motivation, change in education and management processes, strategic planning and management, management processes, classroom management and risk management pre-test and post-test questions are therefore being considered.

Suggestions for Change and Transformation in Education. Within the scope of change and transformation processes in education, determining the educational status of the target group and examining the problems experienced in education will provide very efficient results. When developing projects that may be the solution to these problems, taking into account the existing infrastructure of the school and checking whether the facilities in the current structure of the school provide an environment that facilitates the training activities will help to reach the desired result. The process will be carried out in a healthy way, if the researches should be conducted in order to improve the infrastructure and the opportunities of the school are increased by considering the educational needs.

School administrators, teachers and parents opinions can be asked for on the subject when planning for change in education. If a systematic change study is planned, the content of this study related to the education and the thoughts of school members

should be considered. In this way, it can be said that the change study will be carried out successfully. Moreover, school administrators interaction within the school and all the effort done to ensure school-university cooperation is another issue to be examined. For the control of the process, it can be very useful to keep in touch with the stakeholders who carry out the change and to organize frequent meetings.

The school principal can be influenced individually by the change in school while trying to influence people by taking an active role in school-related activities. From this point of view, it is possible to investigate the level of influence of the school director and the level of change in the studies to the degree which the school principal is affected.

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