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Future-Oriented Policymaking in the Field of Research and Technology of the Ministry of Science, Research and Technology

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Abstract

Purpose: In the modern world, on the one hand, we are witnessing an increase in diversity, multiplicity, speed, extent, and intensity of changes, and on the other hand, an increase in the complexity of the relationships of world phenomena. The current chaotic era is called the era based on knowledge. Today, we are facing the expansion of interdisciplinary sciences in social, economic, political and technological institutions. Therefore, the Ministry of Science, Research and Technology (MSRT) tries to align with social developments and in line with the realization of the idea of creating desirable futures and long-term policy-making and planning; choosing futures studies as a priority and prerequisite in the field of policy making and planning in the university system. In line with the realization of this strategy, a forward-looking article has been written with the aim of the necessity of applying future studies in the policy-making process and in line with the realization of the desired future in the field of research and technology of the MSRT. The results of this article will be able to evaluate or modify a wide range of current actions in the field of research in the form of recommendations and policy packages.

Method: To identify the key factors, forces, and threats caused by changes and opportunities, as well as to provide appropriate policy strategies and measures with a qualitative-exploratory approach of library study methods, document review, in-depth and semi-structured interviews, questionnaire, expert meetings, data-coding and Grounded Theory were used.

Findings: Review and analysis of upstream documents based on the necessity of applying futures studies in the field of research; identification of the processes, obstacles, and challenges of the application of futures studies in the field of research; The extensive and dense accumulation of data around the field of research, data analysis and statistics of scientific concepts from within them in order to present a novel theory is among the research findings.

Conclusion: Based on the findings of the research, coding, and organized collection of data and their inductive analysis, a narration or theory was compiled and developed on the basis of a documentary of real data based on the application of the grounded theory method. The developed theory is able to depict our ideas in the field of research to other people and generalize it to others. The final image answers the research questions and is itself the origin of generating new questions. Based on its theory and narration, recommendations and a policy package were presented.

Keywords: Futures Studies, Science and Technology Policymaking, Research and Technology Field, Ministry of Science, Research and Technology

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Introduction

People's views on future problems in the field of higher education can be different. Increasing the level of competition, changing income trends and flows, population rate and the amount of labor force, and changing the general view of the society towards the category of technology can be considered among the mentioned problems in the field of higher education (Gardner, 1999, p. 67). Some experts consider changes as the cause of changes and believe that higher education is able to rehabilitate and rebuild itself with the help of changes. He paid attention to the future as the main goal of the application and does not consider the use of futurism in the field of education, but rather believes that identifying the driving forces in the process of creating changes and understanding the power and capacity of their application in the field of higher education is the main and important goal of the use of futurism (Goldstein, 2006, p. 198).

How to apply future research in the process of policy making and planning in the field of research and technology support of the Ministry of STI will bring optimal and favorable changes to all the decision-making layers in the said deputy.

Based on the studies carried out, no research has been done with this title in the country, and foreign examples somehow deal with the role of future studies in line with its development in universities and the education system, the future of education and higher education. Identifying the key factors, driving forces and threats caused by changes and opportunities, as well as providing strategies and appropriate policy measures are the results of this research. The necessity of using future studies in the policy making process in order to realize the desired future has been written in the field of research and technology of the Ministry of STI. The results of this article will be able to evaluate, guide or modify a wide range of current actions in the field of research in the form of recommendations and policy packages. This research has also analyzed the upstream documents focusing on the necessity of future studies in the policy making process of the research and technology field of the Ministry of STI and has identified the policy making processes of the research and technology field of the Ministry of STI.

Methodology

In this research, we do not test any assumptions and we seek to examine the theoretical foundations and models that are related to the research topic.

The grounded theory method is known by names such as foundational data theory, foundational data theory, foundational theory, contextual theory, and data-driven theory. Grounded theory method is a kind of qualitative methodology that uses

systematic procedures to create a grounded theory about a phenomenon, with the help of an inductive approach. This research is among the qualitative, exploratory and applied research that tries to reach a significant theory by using the Grounded Theory method. This article considers the field of research and technology of the Ministry of STI as the main area of its study and tries to achieve the optimal and operational application of future studies in the policy making process in the field of research and technology of the Ministry of STI. To identify the key factors, driving forces and threats caused by changes and opportunities, as well as providing strategies and appropriate policy measures; With a qualitative-exploratory approach, the methods of library studies, review of documents and documents, in-depth and semi-structured interviews, questionnaires, holding expert panels, data coding, data analysis and interpretation, and GT were used, and finally the policy and management recommendations presented.

Research Tool	Research Method	Description of Key Activity	Research step
Library study of documents and documents Expert sessions	Comparative studies of documents	Review of upstream documents, sources and documentation	1
Library study of documents and documents Expert panel	Comparative studies of documents	Identifying the policy-making process of the research and technology field of the Ministry of STI	2
Interviews with research experts Expert panel Questionnaire	Acquiring tacit knowledge of experts	Examining the importance and necessity of applying future studies in the process of policy making in the field of research and technology of the Ministry of STI	3
Expert Panels Grounded theory	Acquiring tacit knowledge of experts and theorizing	Extracting policy recommendation and management solutions	4

Results Conclusions

The results of the expert meetings were:

- The subjects of the research were discussed in the meetings and opinions were exchanged and the results of the research were synergized. At this stage, 11 management and policy recommendations as well as 23 solutions to solve existing problems were counted.

- The interview questions were extracted and finalized.

-It was decided after analyzing the content of the interviews and finalizing the recommended items; By using the questionnaire, priority should be given to research recommendations and also synergy on them.

- In the third stage, the questions related to the structured interview questionnaire including 10 questions were extracted and finalized in expert meetings.
- Then structured interviews were conducted. These interviews were conducted with 12 experts in the field of research.
- After the interviews, the obtained data were compiled. By categorizing the propositions, the categories were coded in the form of three steps:
- Open coding including 20 propositions
- Coaxial coding including 12 propositions
- Selective coding in the form of 9 propositions
- In the next step, 9 categories of categories were stated and examined separately in 9 separate tables. These categories are:
- Analyzing data related to indicators and influencing factors in order to improve the use of future studies in the field of research and technology of the Ministry of STI;
- Analyzing data related to indicators and factors of weaknesses and strengths in order to apply the future-research approach in the field of research and technology of the Ministry of STI;
- Analyzing data related to indicators and factors related to what weaknesses do you see so far in the field of future research approach in the field of research and technology of the Ministry of STI?
- Analyzing the data related to the indicators and factors related to how you see the current situation of the research and technology field of the Ministry of STI in the field of applying the future-research approach?
- Analyzing the data related to the indicators and factors related to how do you imagine the optimal situation in the field of research and technology of the Ministry of STI based on the approach of using future research principles?
- Analyzing the data related to the indicators and factors related to what key issues can be counted in line with the application of future research in the policy making process of the field of research and technology of the Ministry of STI?
- Analyzing the data related to the indicators and factors related to what issues the field of research and technology of the Ministry of STI is unaware of?
- Analyzing the data related to the indicators and factors related to what are the barriers to the application of future research in the policymaking process of the research and technology field of the Ministry of STI?
- Analyzing the data related to the indicators and factors related to what recommendations do you have in order to improve the desired future for the

application of future research in the policy making process of the field of research and technology of the Ministry of STI?

- At this stage, a questionnaire was used to prioritize the calculated recommendations.

Using Pursline software (considering the corona situation and the resulting restrictions in the country), the research questionnaire was designed online and sent to 70 experts. The contacts were selected in a targeted manner from among future research experts (experts active in the field of future research and research planning). The selection of experts was completed by the peer selection method. The data collection tool was semi-structured interviews (qualitative approach) and research questionnaire (quantitative approach). The validity of the questionnaire was achieved by holding a small practice round including 20 experts and after applying their opinions; Finally, the questionnaire with 28 questions was approved by the experts.

Conclusions

After analyzing the data, the final writing of the theory begins. As it was said, foundational data theory is the process of compiling and mapping a codified theory with the help of organized data collection, and in the next step, suitable answers for new questions are found by inductive analysis of data, until then suitable theoretical foundations for explaining any hypothesis and we have not conducted the test regarding the mentioned questions. It should be noted that the presented theory is not unrealistic in any way and is based on real and documented data.

Before this step, we performed three coding steps (open, concentric, and selective). Therefore, the picture of research is clearer than ever for us and we should be able to portray these ideas for other people and generalize them in the form of developing a theory. The final image is able to answer the research questions and also be the origin for generating new questions. With the help of the constructed theory, it is also possible to develop new hypotheses for future research.

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