Scientific excellency model in Iran's higher education case study: Guilan university of medical sciences

Mohammad Hoseini Moghadam, Abtin Heidarzadeh, Hassan Bashiri, Hossein Khoshrang and Ideh Dadgaran

Abstract

Purpose – *The purpose of this paper is to answer the question of how scientific excellency can be achieved. The origin of scientific excellency in Iran, national and international experiences concerning the subject has been investigated to review the literature. The authors also designed a process and then a model to test the course. Guilan University of Medical Sciences was selected as a case study for the research.*

Design/methodology/approach – *The approach used in this paper is from Future Studies, with emphasis on the "Participatory Learning and Action" method. It means that different stakeholders, including the strategic council members, managers, faculty members, students, alumni and non-academic staff, have been involved in different parts of the process.*

Findings – *After semantic analysis of scientific excellency in the theoretical field; the examination of national and international experiences in universities; the analysis of higher-level documents of the Ministry of Health and Medical Education as well as strategic documents of the university; the determination of the strengths and weaknesses of the Guilan University of Medical Sciences in online survey; the completion of the scientific excellency canvas in the expert panel and finally obtaining other stakeholders, a conceptual model was designed for achieving scientific excellency.*

Practical implications – *The study of the actions, policies and trends of pioneering universities indicates that it is important to consider issues such as the internationalization of education and research and the modification of university structures. To achieve a superior national and international status, the university must specifically enhance a range of different aspects, from intangible aspects, such as motivation of employees to tangible aspects, such as human resources, structure and facilities.*

Originality/value – *Scientific excellency is going to be one of main streams between universities to attract top students and researchers from all over the world. There has been little academic attempt on scientific excellency. In this research, first the authors examined the concept of scientific excellency, criteria and measurement in higher education, then based on that case study and participatory action learning method, a conceptual framework to achieve scientific excellency in Iran's higher education system was proposed.*

Keywords *Scientific Excellency, Futures Studies, Participatory Learning and Action, Guilan University of Medical Sciences, Higher Education*

Paper type *Research paper*

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1. Introduction

The globalization of higher education has brought different changes for institutions and universities. Countries traditionally leading the world's higher education are losing their position to emerging countries, and this issue represents the openness of the future and the opportunities to achieve a desirable position. In the past, the United Nations, England, Canada, Australia, France, and Germany were the world's leading for higher education.

These countries have not only been attracting students and researchers from all over the world, but also they enjoy from a reputation as the primary hubs for research. Today, there are rising countries, such as South Korea, Singapore, Malaysia, China, Brazil, South Africa, and Indonesia, in the field of international higher education. Considering to higher education as a powerful tool had been one of critical strategies in these countries. Universities are in the center of changes. Hiring top researchers, providing excellent platform for learning and researching are factors which have attracted talented students from all over the world. Developments in the world today are such that were formerly impossible have become possible. Envisioning, planning, and acting in the world of higher education will together form the major paradigm. Adopting a pre-emptive approach to face transitions in the paradigm is essential for universities and institutions.

In Iran, Ministry of Health and Medical Sciences has developed a strategy to urge universities to use their potentials to become scientific hub. Education Transformation package is of action plans in the ministry to realize the high-level strategy. According to the transformation packages each Medical Sciences universities developed their own roadmap to become scientific hub in feasible lines. The main idea of this research comes from a workshop in the field of Future Studies in May 2018 with the participation of managers and faculty members of Guilan University of Medical Sciences. Scientific excellency has been considered as one of the top objectives of the university, so it was the starting point of the research. The questions answered in this research are:

RQ1. How can scientific excellency be achieved?

RQ2. What is the origin of scientific excellency in Iran?

RQ3. What are the national and international experiences in the field of scientific excellency?

RQ4. What experiences will help Guilan University of Medical Sciences to attain the goal of excellency?

In answering the above questions, the research has been initiated with the content analysis of the scientific excellency in high-level policies in the country in the given Sections 2 and 3, world-class experiences in the subject in Section 4, and finally a proposal for the model of the realization of scientific excellency in Guilan University of Medical Sciences in Section 6.

2. The origin of scientific excellency in Iran

The first representation of the concept of scientific excellency in the “scientific development documents of IRAN” is in “General Science and Technology Policies.” The macro policies of the country, including science and technology policies, are determined by paragraph 1 of Article 110 of the Constitution by the leader. The first paragraph of this document emphasizes the necessity of “continuous scientific endeavors to gain scientific and technological excellency in the world”. The Ministry of Health and Medical Education, in September 2012, included the package of “Foresight and Scientific Excellency in Medical Education” in preparing “Transformation and Innovation Packages in Medical Science Education” and these policies are also submitted to all medical universities in the country.

In the package of “Foresight and Scientific Excellency in Medical Education”, four achievements have been considered in medical education: drawing a twenty-year medical education roadmap for scientific excellency, clarification of the indicators of scientific excellency, the definition of hardware and software requirements for the realization of scientific excellency, and the role of the involved organizations. The first part of this package is “designing a monitoring system toward the course of scientific excellency in medical education”, with the aim of “conceptual analysis and determination of the characteristics of scientific excellency in medical education”, “determination of indicators

for scientific excellency" and "development of measures and the system for collecting information about scientific excellency" .

Consequently, the conceptual framework of transformation packages is shown in Table 1 and, by this framework to implement the Transformation Document, at various levels of the Health Higher Education System, actions are designed at three levels including:

1. *Ministry Level:* Consists of actions to be taken at the headquarters of the Ministry of Health to monitor universities' activities. In this level, the ministry plays the role of policy-makers, strategists, and facilitators.
2. *Mega Zones:* This level focuses on the functionality of mega zones to implement the Transformation Document. At this level, each mega zones continuously reports its actions and activities.
3. *Inside the University:* In this third level, plans which have to be considered by the university's units, such as faculties, departments, research centers, hospitals, will be identified and reported. At this level, in line with the priorities set at the second level, each component of the universities provides its operational plan to realize the relative and competitive advantages in the field of scientific excellency in medical education.

According to Table 1, some plans will be carried out in the first and second level. These plans are from top to down. But in the third level universities must consider to their potentials, missions and opportunities. This paper attempts to answer the question of how it is possible to realize excellency in university level based on opportunities and potentials. To answer this question, first, we dive into national and international experiences to specify the features of excellency. Then we used participatory futures studies methods such as expert panel, brainstorming, semi-Delphi, and self-made method call ERTS to determine strengths of Guilan University of Medical Sciences. The design of the participatory process to provide the role and the presence of all stakeholders in determining the priorities of scientific excellency has been a prominent achievement in this research. In the end, in addition to priorities, we proposed an activity diagram in which the role and tasks of each player have been cleared.

3. National experiences

In the scientific community, different perceptions have been presented regarding the definition, factors, motives, and driver-forces that shape the scientific excellency. For example, in Golestan University of Medical Sciences, the subject of scientific excellency has been studied with the participation of graduate students. Extracted topics are:

- "The Last Word of Science".
- "Citation, Referral, and Position in Science".
- "Localization of science in the country.".

According to that research, Iran is currently in the "scientific dependency" phase relative to scientific excellency. Still needing to use translated materials and expecting scientific achievements abroad are the reasons for this claim. The common theme of the "localization of science," with its sub-themes of "belief, excellence, famous scientists and the country scientific background," was another key theme that was presented as an example of

Table 1 Levels defined for transformation packages

First Level	Ministry Level	Supervising, Monitoring Universities activities to realize transformation documents
Second Level	Mega Zones Level	Functionalities of mega zones to implement their mission
Third Level	Inside the University	University's action plan

scientific excellency in this research. Based on the research results, scientific concepts derived from other countries are not necessarily applicable to Iranian universities and may not be in line with the cultural background and beliefs of Iranian society. The findings of this study indicate that the revival of the scientific excellency will be achievable through the localization of science.

In the other research, the subject of scientific excellency has been investigated from the professors of Tabriz University of Medical Sciences. Data collection and analysis in this study were carried out using 230 questionnaires distributed among faculty members. The main factors in achieving scientific excellency, according to the professors of Tabriz University of Medical Sciences are as follows:

- expanding the interaction with the world's top universities;
- strengthening the spirit of criticism;
- achieving advancement in science and knowledge;
- promoting scientific publications;
- more attention to research projects and their transformation into applied technologies;
- funding research projects;
- development of self-confidence culture
- creating scientific joy;
- improving scientific and professional services to the society;
- promotion of scientific capabilities of faculty members; and
- belief in the culture of youth.

Given the diversity of studies conducted in this section, extracted driver forces of scientific excellency are summarized in Table 2.

4. International experiences

The subject of becoming the main hub of international scientific interactions is one of the primary vision of top universities around the world. For this reason, all strategic documents of the world's top universities have been targeted at international presence. In this section, we will examine international experiences to consider the main strategies to become a scientific hub.

4.1 Global indicators

A review of various documents and reports at the international levels shows that there is an effort to have top research and academic centers in the mainstream plans of many countries, especially developed and developing countries. Analysis of these documents will help us, in addition to examining international experiences and the path they have trodden to this point, to understand their orientation and actions to rest at the top.

Philip Altbach, in the International Higher Education Magazine about the scientific excellency of higher education institutions, states:

> Everyone wants a world-class university. No country feels it can do without one. The problem is that no one knows what a world-class university is, and no one has figured out how to get one.

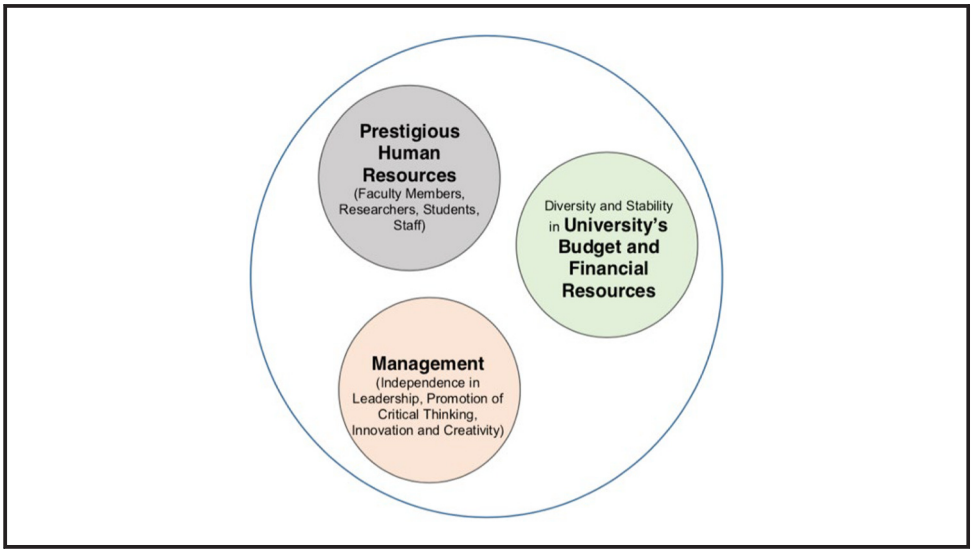
In the research by Dr Salmi published as a World Bank report, three main factors have been identified as the distinguishing factors of world-class universities from others, which are discussed below and in Figure 1.

Table 2 Extracted driver forces of scientific excellency

University/Institute/Researcher	*Scientific Excellency Driver Forces*	
Ilam University of Medical Sciences Members (2016), Bastaminejad (2016)	The establishment of the Leishmaniasis Research and Detection Center as a major asset of the university	
Babol University of Medical Sciences Yahyapour (2017)	Development of knowledge in cancer studies Development of knowledge in herbal medicine Development of knowledge in the family physician Dental science education Genetic detection Cardiac surgery and pediatric heart intervention Kidney transplantation and bone marrow Women's therapeutic interventions and infertility Treatment of neonatal diseases	
Golestan University of Medical Sciences Hekmat-Afshar (2013)	The last word of science Citation, referral, and position in science Localization of science in the country	
Medical Universities in Zone #1 Deputy of Education (2018), Gazani (2016)	Development of the family physician Development of knowledge in cancer studies Development of knowledge in herbal medicine	
Medical Universities in Zone #2 Deputy of Education (2018)	Development of knowledge of pharmacy and related industries Environmental science development Development of knowledge related to traffic accidents Development of knowledge related to psychology by the culture of the country	
Medical Universities in Zone #3 Deputy of Education (2018), Gazani (2016)	Development of health education skills Development of privatization patterns in higher education Development of pharmacological knowledge Development of knowledge of applied biotechnology	
Medical Universities in Zone #4 Deputy of Education (2018)	Environmental science development Development of science related to fertility Development of science related to cancer	
Medical Universities in Zone #5 Deputy of Education (2018), Roudi (2009)	Development of knowledge of biotechnology Development of knowledge of family medicine Development of family physician Development of bio-marine knowledge Development of knowledge related to environmental safety Development of interdisciplinary knowledge related to human sciences	
Medical Universities in Zone #6 Deputy of Education (2018), Pourreza (2011)	Development of the Quranic sciences, hadith and medicine Development of knowledge defining the social context of health Development of interdisciplinary knowledge Development of privatization patterns in education	
Medical Universities in Zone #7 Deputy of Education (2018)	Development of information technology knowledge Development of nursing, and midwifery Sciences Development of accreditation patterns	
Branches of Physics and Mathematics of the Academy of Sciences (Keiaei, 2014)	Universities and scientific centers of the country should be up-to-date, leading and excellent in two areas of science education, research	
Goodarzi (2011)	Scientific flow (having the answer and the solution for problems and the ability to generate a question with theorizing) Excellency (the most significant institution in the chosen field of science) A line break (move the boundary of knowledge) Referring others to the reference and finding the answers there	
Taban (2016)	Human resource development System thinking Team-building Dynamic organizational structure Establishment of knowledge management Expansion of creativity and innovation Reward and motivation Scientific communication and networking The culture of desirability, worthiness, and meritocracy	Economic support Scientific competition Strategic orientation (research line) Improving IT Improvement of educational and research space Ethics in research Stakeholders' interest and motivation Scientific belief Perfectionism Free thinking space

4.1.1 Concentration of talents. In most cases, top universities attract students and faculty members from all over the world, without concern for national borders. For example, 19 per cent of Harvard's students are from other countries (international students); 21 per cent for Stanford University and 23 per cent for Columbia University. At Cambridge, 18 per cent of students are from outside the European Union. The University of New York is home to about 13,178 international students, making it the campus with the most foreign students. The

Figure 1 Three main distinguishing factors of world-class universities



ratio of international students to the total students of this university is about 37 per cent. At Northwest University in Boston, there are 10,599 international students, of which 57 per cent are foreign students.

4.1.2 Diversity in university budget and high financial resources. The second factor that distinguishes top universities is their high budget. Top institutions have several sources of funding. Government money for research studies and staff costs, research contracts with public organizations and private companies, tuition fees and donations from charities are from other sources.

The United States has successful private research universities, each with sufficient funding and resources, constituted in such a way that these universities can determine and pursue mid-term and long-term priorities in their strategic plans. The richest private universities in the United States earn more than $40,000 per student per year. In Canada, the same statistics for the best universities in the country are less than $10,000. Although in the EU, many public universities also have a good budget, the situation of private universities is not very good. In Asia, the Singapore National University has been very successful in terms of management, budgets, and a lot of funding at the university has created a chain of events that allows the university to attract outstanding professors and scholars. These professors will earn more money for the university.

4.1.3 Combination of freedom, independence and leadership. The third identified factor is the combination of freedom, independence and leadership in reputable universities in the world. World-class universities operate in an environment that enhances unlimited scientific competition and research, critical thinking, innovation and creativity, and in such a context, rigid bureaucracies, and standards imposed from outside, cannot limit their independence. As a result, these institutions can manage their resources efficiently and react to rapidly changing global market demands.

Becoming a scientific reference requires serious changes in the system as a whole and its components as parts of the system. The extracted factors derived from examining the experiences of selected top universities in the world to achieve scientific excellency include:

- change the motivation to change the university;
- attracting the best managers to attract the best professors and researchers;

- quality control of staff recruitment by forming a recruiting group;
- hire the best;
- provide a list of talented and successful people;
- the ability to make hard decisions by managers;
- avoidance of frequent changes;
- granting more excellency to head of departments;
- increasing research budgets;
- avoid of bureaucratic formalism;
- administrative availability;
- strengthen communication between executive staff and faculty members;
- management training to professors;
- selecting a management team based on the needs of the university;
- saying “No” to the government!;
- establishing appropriate facilities for employees in the workplace;
- assigning a researcher for university management;
- keeping university administrator for at least five years; and
- a lot of authority to the university director.

4.2 Critical strategies for placing at the top

Many universities are trying to acquire a share of from the global market for higher education. This market has been formed in two areas of education and research. Analysis of the strategic plans of some universities shows that common directions are defined in many programs. These programs can be summarized in the following strategies:

1. *First strategy:* focus on emerging subjects and interdisciplinary fields
   The academic power provided by the university can be better utilized through interdisciplinary research activities. The financial support mechanisms should be increased for intermediary activities and projects.
2. *Second strategy:* Internationalization of research
   International interactions of the university should significantly increase. These interactions should be aimed at participating in joint research with other countries and universities, as well as participating in strategic activities with other academic institutions and selected universities.
3. *Third strategy:* Internationalization of education
   All university courses should be offered internationally, and collaboration with universities around the world should be increased through exchange of students and professors to achieve greater communication and higher quality at the university.
4. *Fourth strategy:* Effective introduction of the university at various levels
   The introduction and promotion of university activities must be expanded in the virtual world and the society in interaction with audiences. Participating in various international events and spreading the name of the university, are among the most effective ways to present the university capabilities.

5. *Fifth strategy:* Education based on research
   In many cases, training is very effective in terms of project definition and research. In this way, in addition to conducting research, the educational goal of universities is also met.

6. *Sixth strategy:* to provide careers for graduates
   The graduate's career should be important for universities. Mechanisms for tracking graduates, connecting with industries, and finding jobs are effective measures that increase student's loyalty to the university and, on the other hand, increase the credibility of the university.

A set of these strategies is presented in Figure 2.

5. Scientific excellency in Guilan University of Medical Sciences

The history of the Guilan University of Medical Sciences goes back to 1965 and the establishment of the Higher School of Nursing. Currently, there are about 5735 students in 8 faculties, including medical, dentistry, pharmacy, paramedical, health, nursing, and midwifery in Rasht, nursing, and midwifery in Langroud and Anzali Campus. Also, there are 452 faculty members, including 24 professors, 115 associate professors, 257 assistant professor, and 56 instructors in the Guilan University of Medical Sciences.

Achieving the preferred futures of the university in each of the priority areas of educational, research, technological, health, and medical care requires the formation of crowd wisdom to outline the vision and objectives. The process of scientific excellency in Guilan University of Medical Sciences was carried out with the participation of the stakeholders of the university. In this step of the research, by using of futures studies methods, we attempted to prepare a suitable platform for participation of all type of stakeholders to design a framework with the goal of achieving scientific excellency.

The following is how the process is described to determine the priorities and main advantages of Guilan University of Medical Sciences to achieve scientific excellency. Based on Figure 3, a process was developed for achieving the model of scientific excellency and stakeholder participation.

Figure 2 Strategies on placing at the top

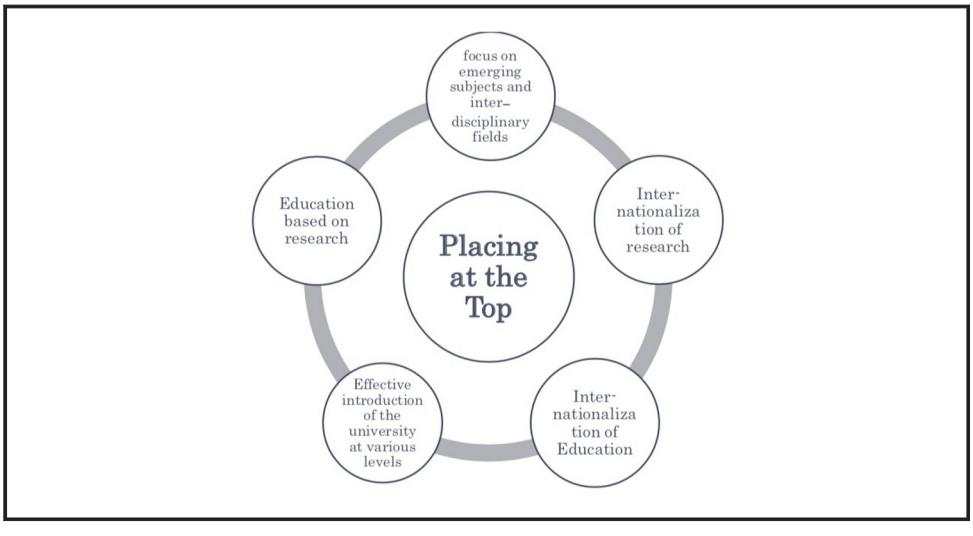
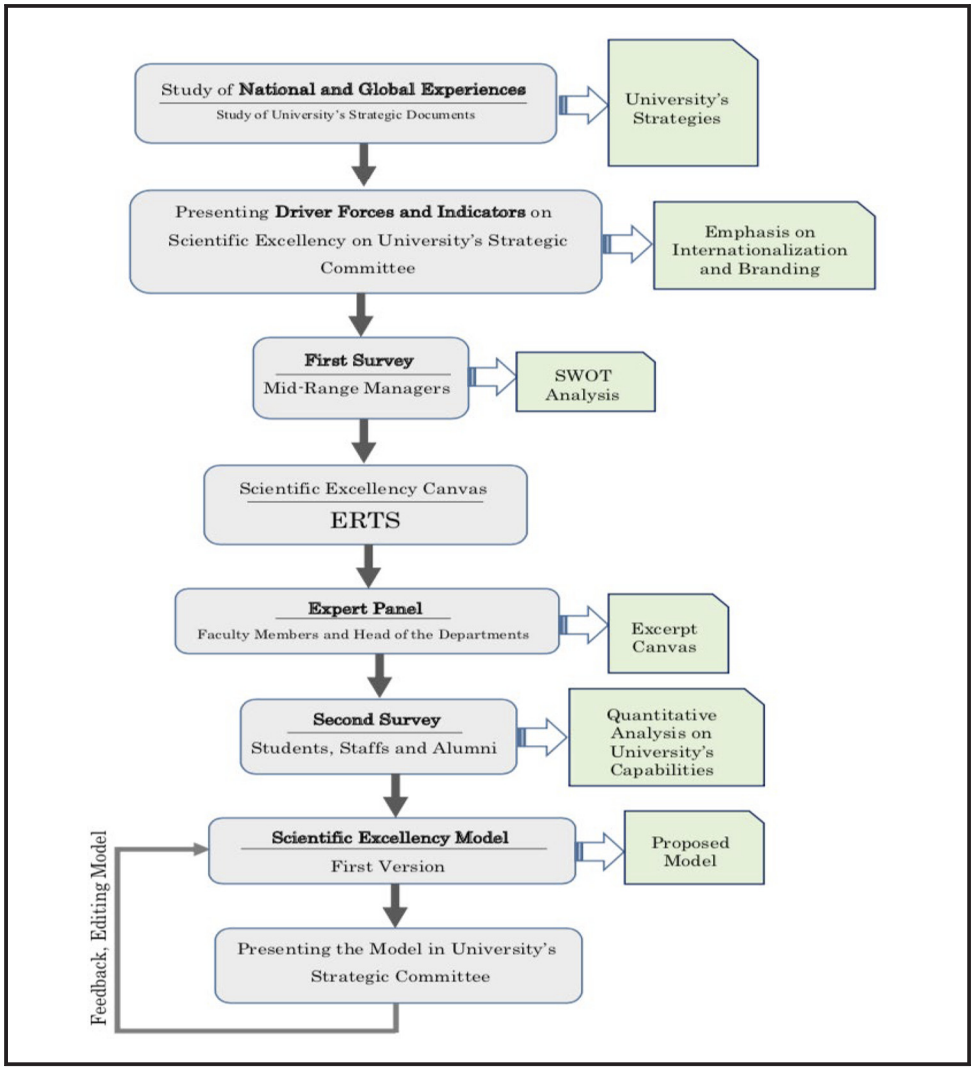


Figure 3 Steps of the research



At the beginning of the research, after studying national and international experiences, upstream documents and strategic documents of Guilan University of Medical Sciences, driver forces of scientific excellency and the indicators were extracted, and the findings of the research were presented in the form of a report in the Strategic Council session of the university. The Strategic Council of the university is the highest authority in decision making at the university, and it consists of the top university leaders and executives. After reviewing the results, university administrators emphasized a few points, including the need to review the priorities in two university strategies. One is "internationalization" and second is "brand promotion". After determining the strategic focus of the university, through the online questionnaire and then expert panel, the participation of faculty members and selected university administrators was set up to determine the priorities for achieving scientific excellency. The description of the implementation steps is presented in Table 3.

In the first survey, the number of participants was 27 managers from different parts of the university, such as education, research, student affairs, support and development departments, and international affairs. The most important points from this survey are as follows:

Table 3 Execution structure of stakeholder views

Step no.	*Objectives*	*Description, method of execution*
1	Identifying and prioritizing the competitive advantages of departments at three levels of University, National, and International, with an emphasis on promoting the brand of the University and the internationalization of education and research in the University	Description: Of each department by managing the head of the department were asked to identify the competitive advantages of your group at the levels required. What are the benefits and potential of your department compared with other departments at the university? At the next levels, attention was paid to the benefits of the department at the national and international levels. A department may have competitive advantages in one level of analysis Method: Online questionnaire: an online form was designed and the link submitted to the head of the departments. Head of the departments responded to these questions at the requested levels
2	Summing up the responses of the head of departments	Description: The responses provided by the head of the departments were aggregated, categorized, and coded. Indicators extracted in the first step (national and international experiences) were also coded Method: Identification of important indicators in national and international ranking systems, content analysis
3	Determine the priorities and potential of the university	Description: In a session with university managers and faculties, the results obtained in step 2 were presented. Then participants discussed different solutions to realize the priorities Method: Expert panel and brainstorming
4	Determine the important indicators that the university needs to have an operational plan to improve	Description: At this stage, the indicators of scientific excellency were prioritized in terms of summing up the opinion of the stakeholders and the level of consensus among them Method: Concept frequency in stakeholder opinions and university strategic document
5	Determination of Achievement Model with Emphasis on Brand Promotion of the University and the Internationalization of Education and Research	Description: Results modeled as an activity diagram of goal achievement Method: Modeling

1. University Advantages and potentialities for achieving scientific excellency include:
    - placing in the appropriate geographical location and accessing to the national and international communication network;
    - having good weather;
    - having strong faculty members;
    - the neighborhood with pharmaceutical manufactures of the province;
    - neighboring the countries of the Caspian Sea;
    - having the only poisoning section in the north and northwest of the country;
    - reputation in transplant surgery;
    - teaching successful assistants;
    - to have modern equipment in the prosthetic sector; and

- the presentation of the innovative csPCNL method for the first time by the Urology Research Center.

2. Proposals for realizing the potential include:
    - investment in the field of health tourism (geography, weather, university's potential, especially in the field of organ transplantation, low-invasive surgery);
    - the extension of the innovative method of csPCNL in the Urology Center (introduction of the method in the conferences and journals, international interactions with other Urology research centers);
    - expansion of collaboration with the Caspian Sea universities (attraction of Persian-speaking foreign students), joint research, provision of short-term study courses;
    - research and technology in the field of herbal medicine;
    - introducing Iranian lifestyle based on Iranian medicine;
    - organizing international scientific seminars to introduce the university;
    - delegation of young faculty members to top research centers as visitor researchers based on a transparent workflow;
    - conducting scientific visits (visiting leading universities in the country and the world); and
    - inviting successful Iranian medical researchers to collaborate with the university.

After summing up the results, according to the plan, the second expert panel was held with the presence of 62 senior and middle managers. The panel was held to think about the priorities for achieving scientific excellency. To structure the potential and priorities for achieving scientific excellency, we developed customized business canvas model and designed a new canvas, titled "scientific excellency canvas." It has four sections: education, research, technology, and services, called ERTS canvas. For each of the four sections, participants were questioned about the desired image, enablers, and obstacles.

In the brainstorming session, we asked participants to engage in the session with a systemic approach instead of the department's approach. In a literal sense, the department's approach is based on advantages on the department regardless of the university's potentials. It should be noted that the department approach was the dominant approach in the online questionnaire, in a way that most participants introduced their field of expertise and department potential as one of the university's advantages. In other words, based on the systemic approach, regardless of participant's specialized fields, individuals must investigate the university in general to determine those areas in which the university has a competitive advantage. At the second session of the expert panel, it was attempted to ask participants to identify the priorities of scientific excellency using a systemic approach and considering the university as a family. To achieve the results and conduct brainstorming meetings, the participants were asked to organize into groups of five to seven to determine the priorities of scientific excellency by observing the mentioned rules, and then, according to the summaries of the discussion, each participant was asked to complete the "scientific excellency canvas".

The model of this canvas is determined based on the competencies and advantages of the university in the areas of education, research, technology, and services, and about each of these areas, the participants were asked to identify the desired picture, enabling factors and barriers. The representative of each brainstorming group also presented the results of his/her group in the meeting. After this meeting, 62 completed worksheets were collected, and then context analysis was performed on them. The important points obtained from this analysis are discussed below. Firstly, it was attempted to determine that each participant

imagines what a desired picture for the university future, according to his/her experiences obtained in each education, research, technology and services areas at the university and to achieve that picture, what enabling factors or barriers exist. A summary of the participants' opinions is shown in Figure 4.

Subsequently, to expand the range of stakeholders, four main communities of the university were examined: faculty members, students, staff, and graduate students. In the second stage, an online survey was designed, and a questionnaire containing both quantitative and qualitative questions was developed and used. The university was asked to select 100 persons as the representatives of the aforementioned community by considering the gender composition, the academic rank, the level of education, and diversity of specialties to fill out the questionnaires. It should be noted that the questions of this questionnaire were designed based on the first survey, the national and international experiences in the field of scientific excellency and the opinions collected from the expert panel. Those items verified and emphasized in the first survey and the expert panel by the participants were questioned in this step to be quantified. In this process, about seventy-five university actors participated in the survey, and the results are presented in the form of university capabilities playing a role in obtaining scientific excellency in Figure 5. Based on the information extracted, the first three competitive areas of the trauma system, organ transplantation, the pole of the north part of Iran and medicinal plants should be considered as indicators of the first phase of scientific excellency in the plans of the university.

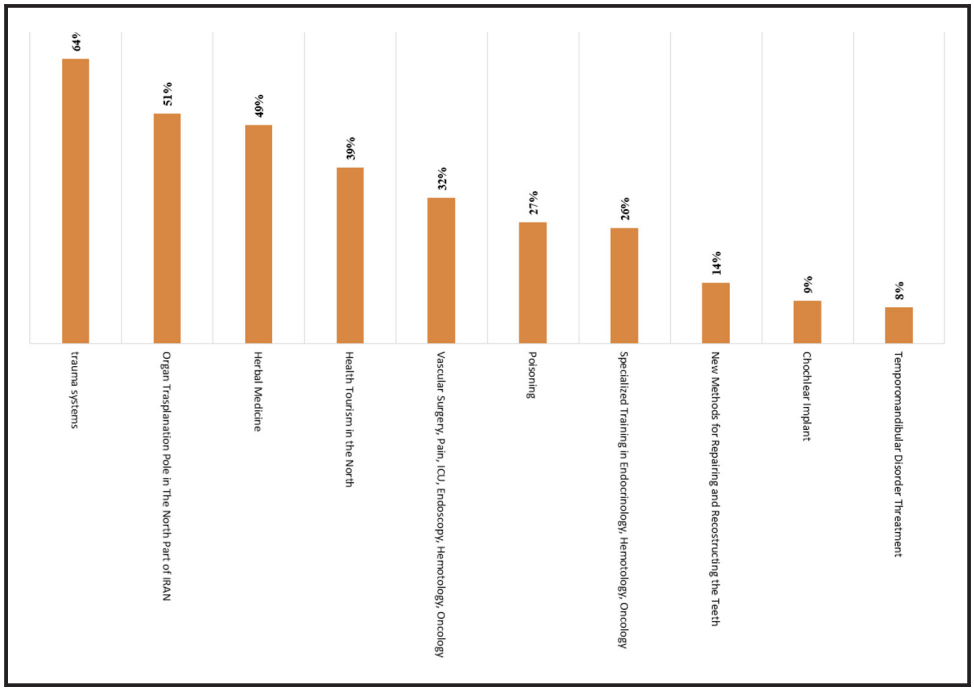
6. A conceptual model for the achievement of scientific excellency

6.1 The structure of the proposed model

According to the roadmap shown in Figure 3, after semantic analysis of scientific excellency in the theoretical field; the examination of national and international experiences in universities; the analysis of higher-level documents of the Ministry of Health and Medical

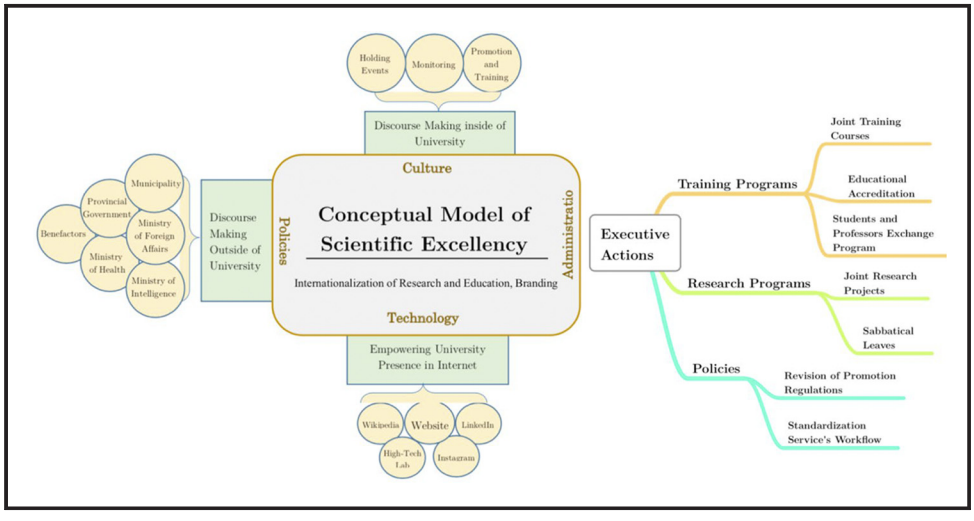
Figure 4 A summary of participants' opinions in the scientific excellency canvas (in Persian)

Figure 5 Competitive areas of the university in the scientific excellency plan



Education as well as strategic documents of the university; the determination of the strengths and weaknesses of the Guilan University of Medical Sciences in online survey; the completion of the scientific excellency canvas in the expert panel and finally obtaining other stakeholders, a conceptual model was designed for achieving scientific excellency, as shown in Figure 6. In this model, to achieve scientific excellency in Guilan University of Medical Sciences, four aspects mentioned are considered. It should be noted that these

Figure 6 Proposed model for achieving scientific excellency in Guilan University of Medical Sciences



aspects were determined after obtaining the university stakeholders opinions, qualitatively coding them, analyzing convergent and divergent points.

6.2 Discourse-making

This pillar states that if the university wants to identify its scientific excellency and excellence in the target specialized fields, it needs to customize them within itself; in other words, the goal of achieving excellence and scientific excellency must be converted to a public demand of the university stakeholders, including managers, faculty members, staff and students. Otherwise, the main actors of the university, which should be responsible for the realization of scientific excellency, are unfamiliar with this issue and treat it as a top-down and imperative matter. Promoting and generalizing the issue of scientific excellency and excellence of the university by holding different events can help to make a discourse for re-orienting scientific excellency as a bottom-up matter. Inviting speakers and known professionals from those in the university or those known at national and international levels to familiarize the scientific and support staff and university students with the importance of being excellent and enjoying scientific excellency are considered examples of promotional activities. In addition to promotion, education and, culturalization, the university must provide an opportunity to monitor its activities as well as the activities of other universities at the national and international levels, and publish the results and present them in the events to make it possible for faculty members, staff and students to compare the universities and mentally analyze the gap between the status quo and the favorable situation of the university in an abstract way. Such a gap analysis results in the generation of a sense of demand for the transition from the status quo to the desired state among the main stakeholders. The issues of culturalization and discourse-making have also been seen as the priorities of a program outside the university.

According to the opinions obtained, the university cannot desirably implement the intended programs adjusted for the achievement of excellence and scientific excellency without the support of the institutions important at the urban, provincial and national levels. For example, within the framework of the university's internationalization strategy, the topic of attracting international students and researchers has been highlighted as one of the strategic priorities. The important note is that the urban infrastructure and facilities in the city must facilitate the attraction process in terms of providing access to the necessary supplies, entertainment and recreational facilities needed by international students and researchers. This suggests that, in the long-term horizons of the university, to convert Rasht City into an international student admission pole and to expand the health tourism and many other plans that the university intends to implement, it should be able to persuade important entities, such as the governorate, the municipality, the unions and related guilds to cooperate with it to avoid the creation of problems.

Based on the study of the experience of pioneer universities and opinions extracted from experts in panels, legal and natural actors influencing the academic excellency process of the university are categorized as follows. Those actors who have a direct impact are shown in bold, and those with indirect impact are shown in pale Figure 7. Consequently, the process of discourse-making must be done by emphasizing the role of both actors.

Based on the role of these actors, the four main factors for success in scientific excellency are determined as the keys described in Table 4. These keys have been extracted from the literature on scientific excellency and have been incorporated into the experiences of stakeholders at top universities in the world. Titles and experiences were categorized into four categories as the four keys for achieving scientific excellency. One of these keys is education. That is training various role-makers, from faculty members to employees, in such a way that the work processes are completely clear and transparent to provide excellent services.

Figure 7 Actors playing a role in achieving scientific excellency

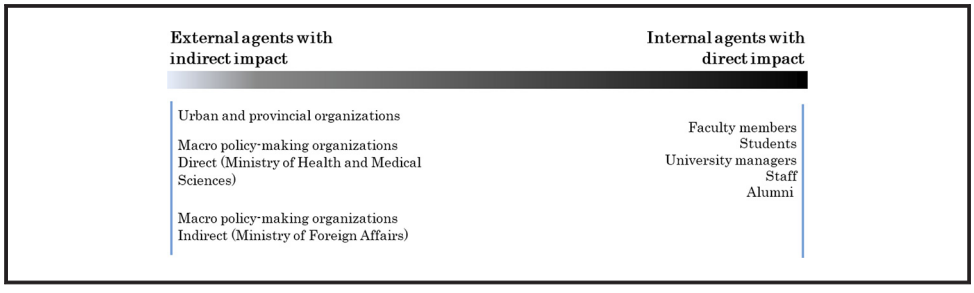


Table 4 Keys extracted from the topic literature and stakeholders' opinions

First key: training role-makers	Second key: Emphasizing National / International Cooperation	Third key: Effective Incentives	Fourth key: Effective Presentation
Training of staff / faculty members / managers in the field of education, research, services, and technology with international standards The scholars and staff that make the university reputable in different fields should be supported outside of conventional regulations	In different parts of the university: education, research, services, and technology. The emphasis on international cooperation should be highlighted The presentation of the members' achievements in the physical world (Museum of University Achievements) and the impressive display in the virtual world (the efficient and standard web site in terms of structure and content) are very effective in making the university reputable		

Various studies have shown that those universities which have worked closely with top universities could grow in the area of higher education competition. This point is also mentioned as the second key to achieving scientific excellency. Different rules and incentives are also required to be considered to distinguish the universities. This issue, which was emphasized by the staff of Guilan University of Medical Sciences is the third key, to attract individuals, such as researchers, students, and faculty members, the university should be able to effectively present itself in both real and virtual worlds.

6.3 Policy-making and action plan

Three items are investigated under this section as follow:

1. A. Educational area. In this area, the priority programs of the University for achieving academic excellency in the field of education include:
2. A-1. Holding joint training courses: this program is implemented based on conventions and protocols between Guilan University of Medical Sciences and other peer and selected national and international universities. A specialized consortium of several national and international universities may be arranged along with a joint educational program and a degree with the approval of participating universities.
3. A-2. Educational Accreditation: in this section, it is expected that the university will be able to pass the quality assurance and accreditation processes defined by reference bodies at the national and international levels to identify the gap between the status quo and desired status in the target areas. In addition to standardization, and based on the gap analysis, it takes some actions to achieve the strategic goals.

4. A-3. Holding ad hoc courses: This implies that the university should be able to create the necessary capacities and flexibility to design and hold specific courses according to the international students' needs. A review of national and international experiences suggests that, in many cases, the international students' degrees are verified by the related bodies once they meet the standards defined by those bodies. Accordingly, it is required to create the necessary flexibility to change the curricula and syllabuses proportionate to the needs of individuals.
5. A-4. Professor and student exchange programs: the University must provide some programs for the exchange of professors, students, and international scholars in selected areas. Selecting target countries in this process is an important issue. Considering the geopolitical position of the province, cultural, and historical links with the Caspian area countries, it can be said that these countries can be considered as target countries, so that in addition to bilateral and multilateral scientific exchanges, interactions in other non-scientific and technological areas, such as tourism, economy, culture and politics can be expanded.
6. B. Research Programs. Following this part, the priorities for achievement of scientific excellency include:
7. B-1. Design and implementation of joint research projects: According to the stakeholders, the design and implementation of joint research projects in selected areas with non-Iranian peer universities and the funding of such projects by the university can provide a ground for scientific excellency. Attracting international organizations, such as the World Health Organization, can also pave the way for the achievement of reputation and becoming a scientific brand for the university.
8. B-2. Sabbatical leaves: One of the priority programs in the field of research is to define sabbatical leaves at the university and outside of it; simply put, the university should provide proper opportunities for sabbatical leaves for non-Iranian researchers and scholars at Guilan University of Medical Sciences in addition to encouraging its faculty members and scholars to conduct scientific trips, and this will require the provision of the necessary infrastructure, such as paying the salary to or funding the guest researcher, providing the work room and equipment required.
9. C. Policy-making. Concerning legal infrastructure, encouragement, clarification, and standardization must be done.
10. C-1. Revision of Promotion Regulations: A revision of regulations has been introduced as one of the policies. In this part, the emphasis has been placed on encouraging university actors to participate in internationalization and branding programs as a priority. Considering special privileges for faculty members who attract foreign students, pursuing international joint research, establishing effective interaction between the university and related international organizations, implementing short-term training programs in non-Iranian universities, expressing the experiences of the university, and attracting national and international donations to carry out research projects are among the ways by which the university can encourage and motivate staff to play a role in realizing the strategic objectives of the university.
11. C-2. Standardization of processes and services: in this part, it is attempted to clarify all activities related to achieving scientific excellency and excellence in two key strategies of the university, including internationalization and branding; in other words, for all actors involved in these two strategies, it is necessary to determine all the details from the beginning to the end in a clear and traceable way. For example, an international student and scholar who is interested in studying or performing research at the university can easily read the guidelines and documents of the university to

know the details of the required activities and processes to begin to study, research, and so on.

6.4 Technological aspects

In this part, the emphasis is placed on strengthening of the university's presence in the virtual world. The university must communicate its capabilities and competitive and relative advantages in an accessible and traceable way in cyberspace. This communication can be made in different languages, such as English, Russian, and Arabic, depending on the selected countries. Improving the university's website and advertising the university in virtual social communication networks such as Instagram, Twitter, Facebook, LinkedIn and Wikipedia makes it easy for the university to be seen. This is an effective step to start many of the programs and activities in the area of branding and internationalization. It should not be forgotten that the first window that prospective researchers and students will see is the university's website and university profile on social media networks. To become an excellency, it is necessary to have a strong presence in the virtual world. This presence means to design the structure of the university's website using up-to-date technologies, to effectively improve the content and to display the achievements of the university, as well as to complete the university profile on social networks. It is worth mentioning that the review of global experiences showed that the top international universities' main strategy for advertising is to be present in cyberspace and the global Internet.

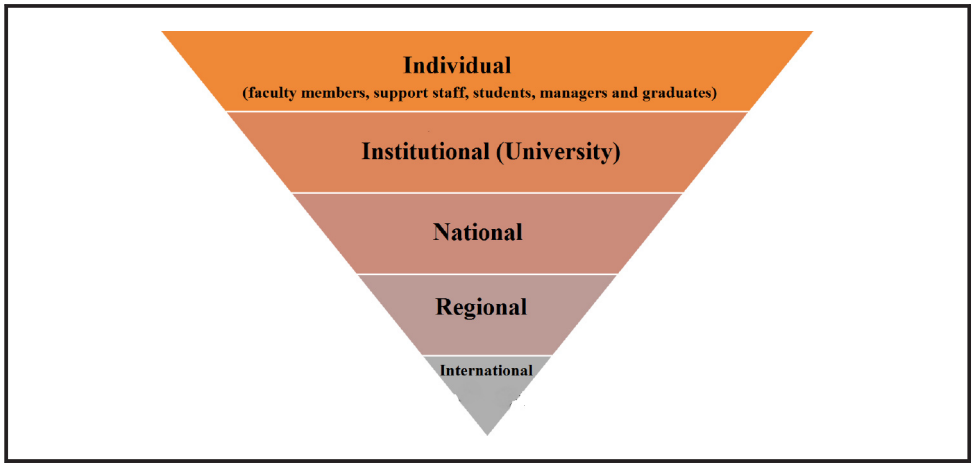
7. Conclusion

The study of the actions, policies, and trends of pioneering universities indicates that it is important to consider issues such as the internationalization of education and research and the modification of university structures. To achieve a superior national and international status, the university must specifically enhance a range of different aspects, from intangible aspects, such as motivation of employees to tangible aspects, such as human resources (i.e. students, faculty members, and staff), structure and facilities. Top universities of the world best introduce their facilities, potential, faculty members and managers; in addition, they are trying to best introduce academic and scientific resources in the virtual world and, to this end, they apply all of the individual and collective innovations and creations. The analysis of strategic documents, missions, visions and annual reports of different universities indicates that future programs of the university should be considered at different levels to shape the desired future. These levels range from individual to global levels (Figure 8). It is very important to pay attention to talented staff and to attract capable people for the executive, faculty, management and research sectors as well as students as applicants for education and research. At the top universities, the roles are very important. Different reports discussed the role of the head of the university as well as the managers of the groups.

The recruitment of employees must be done through a committee consisting of the best individuals. Moreover, managerial changes at universities should not take place in short intervals. The structure of the university should be malleable and away from bureaucracies so that it can be flexibly adapted to the rapid changes. Creating structures for communicating with industries, knowledge-based companies, and spin-offs is one of the developments that are taking place in the universities. In the following, some of the conceptual, theoretical and practical achievements of the present study are listed. Studies have shown that to achieve scientific excellency some changes should be made in attitudes and, in some cases, structures at the analysis levels mentioned in this report, the most important ones are as follows:

- The stakeholders, including staff, faculty members, and managers, should be trained for each subject. The workflow and job description, like those in the world's top

Figure 8 different levels of analysis and planning for achievement of excellence



universities, should be clear and understandable for each, and they should be documented adequately.

- Analysis of the experience and performance of the world's top universities shows that the most important potential of those universities that have become scientific excellent are faculty members who are capable in various fields of education, communication with industry, research, scientific cooperation, etc. This factor is more significant than the university structure. Hence, according to the agent-structure theory, in addition to paying attention to structures, it should be noted that in the field of scientific excellency, agents and actors of the university are the most effective factors. Therefore, the message is that the faculty member should be carefully selected in a way that only talented, intelligent and capable people are placed in faculty positions.
- An efficient system attracts talented students. These students help their professors in the research. These people should be attracted from all around the world.
- Excellent Grant System: the University should devise a highly efficient grant system for research affairs. What first introduce the university to the international community are those effective, highly cited, applied and innovative studies performed at the university. Research should be a matter of interest to the heads of universities.
- At the top universities, the norm is that members should work hard. The system should be such that a faculty member at the university serves it and outside of the university, acts as its branding factor. All university members should work hard and seriously.
- Having sustainable financial resources to be used for advancing the goals and plans of the university in the field of scientific excellency. The university must be able to use reliable and sustainable resources to meet the requirements of excellence in the field of scientific excellency. Charities, industries, and other relevant institutions at the national and international levels are among the examples to be considered in this area.
- Discourse-making is essential to become a model and an excellent university within and without the university. There is a need for some kind of demand within and without the university to direct the university towards achieving academic excellency and excellence.

- The use of interdisciplinary approaches in the specialized fields to create synergies and to provide new educational, research and technological services plays a key role in utilizing the capacities and abilities of the university.
- Paying attention to the geopolitical and territorial positions of the university to develop joint educational and research programs and to become a center of excellence in areas where the university has a competitive advantage, in addition to the university considered by itself, can make the city and the area where the university is located into a scientific pole .

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