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Original Article

A conceptual model for empowering faculty members of third-generation universities of medical sciences

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الملخص

أهداف البحث: يجب أن تكون جامعات الجيل الثالث قادرة على أن تكون مستقلة وأن تعد طلابها لتلبية احتياجات المجتمع ودخول سوق العمل. في الواقع، الأداء المتوقع منهم هو تطبيق البحث في المجتمع. على الرغم من الدور الحاسم للموظفين وخاصة أعضاء هيئة التدريس في التحرك نحو جامعات الجيل الثالث، فضلا عن ضرورة تمكين الموظفين، إلا أنه تم إجراء عدد قليل من الدراسات حول تمكين أعضاء هيئة التدريس (أعضاء هيئة التدريس). هدفت هذه الدراسة إلى تصميم نموذج تصوري لتمكين أعضاء هيئة التدريس في جامعات العلوم الطبية وتسهيل الانتقال إلى جامعات الجيل الثالث.

طرق البحث: تم اعتماد منهج النظرية المتجذرة لإجراء هذه الدراسة النوعية. تم اختيار ما مجموعه 11 من أعضاء هيئة التدريس من ذوي الخبرة في ريادة الأعمال كعينة باستخدام أخذ العينات الهادف. تم جمع البيانات باستخدام المقابلات شبه المنظمة، وتم إدخال البيانات التي تم الحصول عليها في برنامج حاسوبي مصمم للبيانات النوعية والمختلطة بمساعدة الكمبيوتر.

النتائج: تم تلخيص المفاهيم المحددة في عملية الترميز وتصنيفها إلى خمس مجموعات وسبع فئات رئيسية. تم تصميم النموذج التصوري بعد ذلك بمجموعة من العوامل السببية (بما في ذلك هيكل نظام التعليم، والتوظيف، والتدريب، والاستثمار)، وعوامل الهيكل والسياق (بما في ذلك الهيكل والعلاقة)، والعوامل المتداخلة (بما في ذلك أنظمة الترقية والترتيب في الجامعات ونقص من الثقة المتبادلة بين الصناعة والجامعة)، فئة أساسية (خصائص أعضاء هيئة التدريس الأكفاء)، والنتيجة (جامعة الجيل الثالث). أخيرا، تم تطوير النموذج التصوري لتمكين أعضاء هيئة التدريس في جامعات الجيل الثالث من العلوم الطبية.

الاستنتاجات: بناء على النموذج التصوري المصمم، فإن أهم قضية في التوجه نحو جامعات الجيل الثالث هي "خصائص أعضاء هيئة التدريس القادرين". تساعد النتائج الحالية صانعي السياسات على فهم العوامل الرئيسية التي تؤثر على تمكين أعضاء هيئة التدريس بشكل أفضل.

الكلمات المفتاحية: النموذج التصوري؛ التمكين؛ جامعة الجيل الثالث؛ أعضاء هيئة التدريس؛ الجامعات الطبية؛ النظرية المتجذرة

Abstract

Background and objectives: Despite the crucial role of university staff and especially faculty members in moving towards third-generation universities, as well as the necessity of staff empowerment, only a handful of studies have been carried out on staff (especially faculty member) empowerment. This study designed a conceptual model for empowering faculty members of universities of medical sciences and facilitating transition to third-generation universities.

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Methods: The grounded theory approach was adopted to conduct this qualitative study. A total of 11 faculty members with entrepreneurial experience were selected as the sample using purposive sampling. The data were collected using semi-structured interviews, and the obtained data were entered into qualitative software (MAXQDA 10) for analysis.

Results: The concepts identified in the coding process were summarized and classified into five groups and seven main categories. Then the conceptual model was designed with a set of causal factors (including structure of the education system, recruitment, training, and investment), structure and context factors (including structure and relationship), intervening factors (including promotion and ranking systems in universities and lack of mutual trust between industry and university), a core category (characteristics of capable faculty members), and an outcome (third-generation university). Finally, the conceptual model was developed to empower faculty members of third-generation universities of medical sciences.

Conclusions: Based on the designed conceptual model, the most important issue in moving towards third-generation universities is "characteristics of capable faculty members." The present findings will help policy makers better understand the major factors affecting faculty member empowerment.

Keywords: Conceptual model; Empowering; Faculty members; Grounded theory; Medical universities; Third-generation university

Introduction

Factors such as increased expectations of higher education quality, the necessity to employ modern administrative methods, globalization, increased number of interdisciplinary studies, increased research costs, and the need to promote the cooperation of universities with industry and entrepreneurial entities have motivated university authorities to move towards third-generation universities.[1] Using applied knowledge, competition for hiring faculty members, gaining students and research contracts, development of network collaboration and activities, expansion of interdisciplinary studies, development of multicultural environments and international activities, and reduced dependence on government are the main features of third-generation universities.[1] University staff and especially faculty members substantially influence university performance.[2,3] In Iran, the concept of third-generation universities has been addressed in some development and innovation plans. For example, in the Third Economic, Social, and Cultural Development Plan of Iran, special attention was paid to the entrepreneurship, and an extensive plan was formulated for the development of entrepreneurship in Iranian universities.[4] Moreover, one of the main objectives of the Packages for Reform and Innovation in Medical Education prepared by the Iranian Ministry of Health and Medical Education was to develop third-generation universities across the country.[5]

Faculty member empowerment programs can help authorities successfully accelerate the transition to third-generation universities.[6] Despite the great potential of universities of medical sciences to become third-generation universities, today's Iranian universities are optimistically considered second-generation universities.[7] The identification of suitable opportunities and provision of students with these opportunities facilitate the transition from second- to third-generation universities[8] Obviously, faculty members, who work with students both as teachers and advisors, can best play this role. Accordingly, faculty member empowerment is among the most decisive factors influencing successful transition to third-generation universities.

The structure of the current study is as follows. The second section presents the theoretical research foundations, defines third-generation universities and the concept of empowerment, and reviews the background of studies carried out on faculty member empowerment. The third section thoroughly explains the various steps of the grounded theory approach, and the fourth section presents the research findings. Finally, the fifth part of the study discusses the findings and provides some suggestions for empowering faculty members in order to facilitate the movement of universities towards third-generation universities.

Theoretical foundations

Third-generation universities: Universities are fundamentally changing from science-based to third-generation entrepreneur universities.[1] Entrepreneurship is a combination of political, social, cultural, and economic factors that support the development of creativity/innovation-based investment in a region.[9] There is no clear definition of entrepreneur universities. Some scholars consider "technology transfer" as the main mission of third-generation universities, whereas others believe that "cooperation with business" is the most important mission of these universities. In a general view, the mission of third-generation universities is to contribute to the economic and social development of societies.[10] An active presence in international markets is a distinctive feature of a third-generation university. These universities cooperate with industries, investors, professional service providers, and other universities through some networks. Students and researchers at third-generation universities often conduct interdisciplinary research. These multicultural institutions enroll a diverse range of students from various countries; therefore all of their courses are offered in English. Furthermore, these universities operate independently from state research entities.[1]

Third-generation universities train entrepreneurs by changing their educational methods and transforming their research models. These educated entrepreneurs often seek

non-governmental occupations and attempt to start new businesses. In fact, universities must be entrepreneurial in their actions, orientations, education, structures, practices, culture, and research.[11] This new role requires fundamental changes in the internal affairs and activities of academic institutions.[12]

Empowerment: Human resources (including innovative managers, effective teaching staff, and efficient non-teaching staff) are integral parts of higher education systems. Organizations that identify, use, and develop such resources can successfully provide sustainable quality education.[13] Therefore, capable faculty members play an important role in enhancing university performance and training entrepreneurs. Accordingly, special attention must be paid to faculty members in the transition of universities to third-generation universities.[14]

Empowerment is an active and participatory process that helps individuals, organizations, and communities gain greater control, efficacy, and social justice. The three levels of empowerment are individual, organizational, and social. At the individual level, the empowered person believes in his/her power to influence the environment and gain control over his/her life. At the organizational level, organizations try to achieve their goals by increasing staff capability and enhancing organizational effectiveness; and at the social level, communities try to increase control over their lives by enabling.[15] Numerous factors affect organizational empowerment. Examples include opportunity role structure, leadership, social support, and shared beliefs. These factors are the four main dimensions of intra-organizational empowerment.[16] On the other hand, participation in alliance-building promotes cooperation with other organizations, encourages networking, and results in inter-organizational empowerment. Information dissemination is another factor that contributes to extra-organizational empowerment and leads to positive social actions. It also helps organizations influence society through public policies, thereby increasing citizen participation.[17] Intra- and inter-organizational components of empowerment are the bases of extra-organizational empowerment. They facilitate the establishment of a network of organizations, increase community capacity, and improve the performance and policy of society.[18]

Restraining and driving forces: To empower their employees, organizations must first prepare the ground for the change. Many unknown barriers hinder the implementation of organizational changes. Preparedness for change is consistent with Kurt Lewin's "unfreeze" stage, which is the stage at which members of the organization prepare themselves for change efforts.[19] In 1950, Kurt Lewin developed a theory of social change, called the force field theory, according to which social institutions are considered a balanced medium of driving and restraining forces. According to him, balance is maintained when the sum of driving forces equals the sum of restraining forces. Restraining forces reduce the power of driving forces. Based on Lewin's model, change requires separate processes of unfreezing, changing, and refreezing. The balance can be disturbed by decreasing the restraining forces, increasing the driving forces, or both. Lewin argues that the restraining and driving forces continuously influence changes occurring in all situations.[20] Organizations also need to meticulously assess various components of individual and organizational empowerment. An organization's overall success depends on all of its elements including its physical and inhuman factors and conditions (which collaborate systematically to form the material nature of the organization) and all organizational relations, as well as all environmental and extra-environmental conditions and factors. This is also consistent with Mirzaei Ahranjani's Three-Pronged Theory (including structure, behavior, and context), according to which no organizational phenomenon or event can take place without the interaction of these three factors. Therefore, to facilitate the transition of universities to third-generation universities, all effective organizational factors (including structural and contextual factors) need to be carefully examined.[21]

Literature review

Numerous researchers have examined the issue of employee empowerment. Table 1 summarizes the results of major studies conducted on faculty member empowerment and entrepreneur universities.

Materials and Methods

This qualitative study was carried out using the grounded theory approach of Strauss and Corbin (1998). This method gives researchers a deep understanding of the studied phenomena in their real contexts and provides a conceptual research framework.[22] By producing theoretical explanations for various phenomena, the approach helps scholars examine the structure and pattern of those phenomena.

Sampling process

The participants were selected using purposive snowball sampling and theoretical sampling.[23] They were selected from four universities of medical sciences. Taking into account that the method of sampling was purposive and the universities of medical sciences comprise various schools, hospitals, and directorates, which carry out all responsibilities concerning treatment, medical education, health, and food and drug management of society and employ the best faculty members of the Ministry of Health and Medical Education, as expected, they introduced the largest number of participants among the professors of the universities of medical sciences as candidates for their interviews. The process of sampling was continued until theoretical saturation.

The participants selected with the snowball sampling method were asked to suggest special cases or faculty members with special characteristics (e.g., those with entrepreneurial characteristics and those with a history of working on a third-generation university project). Theoretical sampling was used because grounded theory uses concept-based units of analysis. In this method, samples are selected in a way that helps researchers develop a new theory.[22] A total of 11 faculty members with a history of entrepreneurial activities were

selected as the final sample. The majority of participants were male (n = 9). Since most of the participants were male, one probable limitation of this research was the factor of sex.

Data collection process

The data were collected using semi-structured interviews. The authors developed the interview questions after reviewing the literature and discussing the research subject with relevant experts and scholars. Two participants were initially interviewed in a pilot study, and the content of the interview was revised based on the results of the pilot study. The duration of each interview varied from 45 to 90 min, and the interviewees provided authors with their views and opinions about the research subject based on their knowledge and experience. To provide a comfortable conversational environment, the interviews were held at a mutually agreed-upon place, either at the participant's workplace or home. With regard to the busy schedule of the participants and since they were unable to complete an interview in 1 day, supplemental interviews were carried out with several participants.

Data analysis

The interviews were recorded after obtaining permission from the participants. Then the recorded interviews were transcribed verbatim. The content of each interview was carefully reviewed, analyzed, and coded by three members of the research team at the end of each interview. During several meetings, the initial codes were compared and divergent interpretations were discussed. The open codes were then analyzed and summarized by the fourth member of the research team. In the grounded theory approach, the data are analyzed in three stages of open, axial, and selective coding. Coding strategies adopt structural and inductive methods, and require complete data saturation. Open coding was the first stage of the data analysis process. Open coding breaks down the data into their smallest units, and closely examines and compares them for similarities and differences. In axial coding, data patterns, concepts, and categories are determined. This stage requires constant comparison of all data. At this stage, the coded data were compared with each other to form clusters or categories with similar features. In selective coding, the selected categories are related to the core phenomenon, and the conceptual theory is developed. At this stage, the researcher focuses on the process, and tries to determine the core phenomenon.[22]

The researchers continued the interviews until the data reached theoretical saturation (i.e., no new information or concept was derived from the interviews). The concepts were identified in the open coding stage. In axial coding, the identified concepts were summarized and classified into the main categories and subcategories. The data were analyzed with MAXQDA 10. The coding process was completed in the form of a paradigm consisting of structure and context factors, causal factors, intervening factors, the core phenomenon, and outcomes. The conceptual model was then designed with a set of causal factors (including structure of the education system, recruitment, training, and investment), structure and context factors (including structure and relationship), intervening factors (including promotion and ranking systems in universities and lack of mutual trust between industry and university), a core phenomenon (characteristics of capable faculty members), and an outcome (third generation university) (Figure 1).

Prolonged engagement and triangulation were used to increase the overall reliability of the research.[24] Prolonged engagement and the process of data collection, analysis, and integration lasted several months to ensure theoretical saturation of all categories. The triangulation process was performed by several coders and internal auditors through coding and analyzing the data obtained from several interviews. Three members of the research team (L.N., E.H., and K.H.) performed encoding and a fourth member (M.M.) supervised the internal audit. The data were interpreted by two members of the team (M.M. and K.H.), and audited by a further member (M.J.). Furthermore, to improve the precision and accuracy of the recorded validity, the participants were again asked to revise the findings such that they could be confirmed. To maintain the general standards of qualitative research, the authors took into account their own opinions regarding the research subject during the design, implementation, and analysis stages. Although the authors had multiple opinions, they generally supported the skills and competencies needed to train entrepreneurs and move towards third-generation universities. They all believed that universities are inevitably moving towards third-generation universities, and that the needs and experiences of faculty members are crucial in this process.

Results

Table 2 presents the demographic characteristics of the 11 faculty members who participated in this study. The results of the open and axial coding processes are presented in Table 3. The concepts derived from these coding processes are associated with relevant concepts.

Core phenomenon

To ensure the existence of strong relationships between the core phenomenon and other variables, the authors examined the relationships of this category with all main categories and codes. "Characteristics of capable faculty members" were determined as the core phenomenon. This category affected the empowerment of faculty member, transition to third-generation universities, as well as all codes and subcategories. The participants classified the major skills of faculty members of third-generation universities into soft and hard skills. Soft skills included relationship establishment ability, leadership, mentorship, identification of current needs of society, problem-solving ability, risk taking, critical analysis and thinking, innovation, creativity and ideation, attitude, motivation and thoughts, teamwork, and interdisciplinary approach. Hard skills included marketing and qualification for receiving research grants, technological mastery, integrated project management, and knowledge management.

According to the participants, the capabilities of faculty members are vital to the movement of universities towards third-generation universities. Faculty members are the main

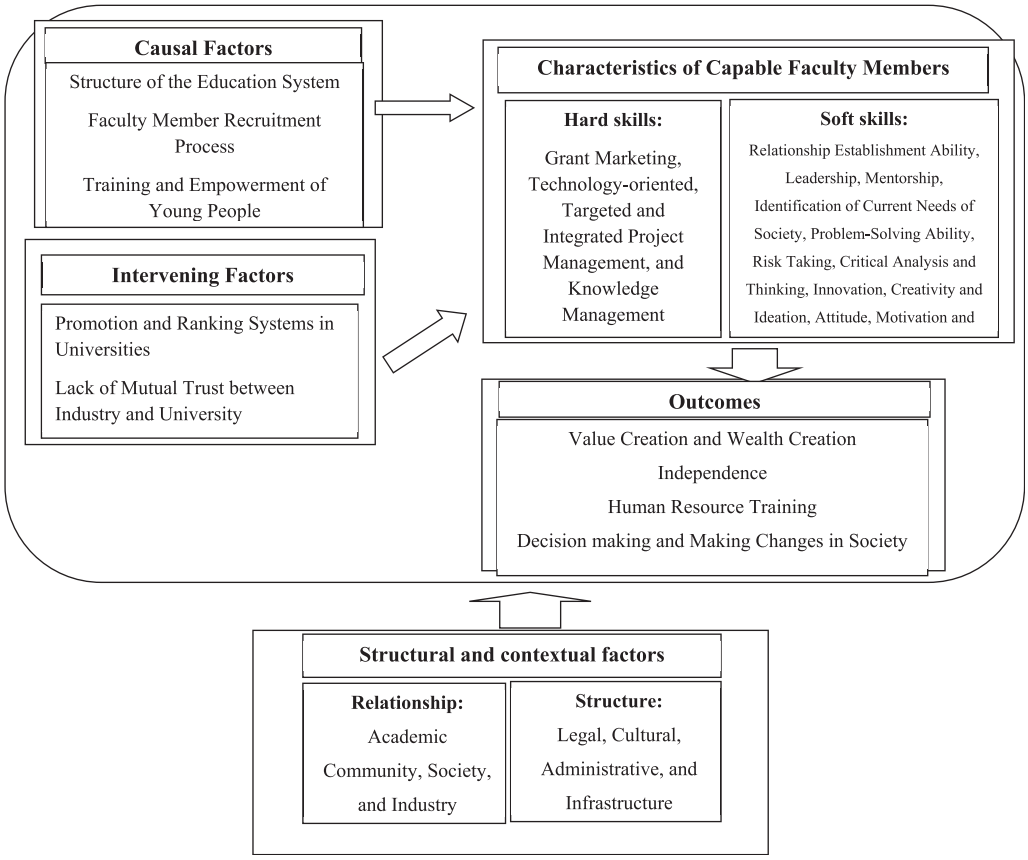

Figure 1: Conceptual model for empowering faculty members of third-generation Iranian universities.

Table 1: Articles' abstracts related to the empowerment of faculty members.

Authors	Title	Study year	Country	Results
Fadhilaini et al.[44]	Improving employee engagement of Muhammadiyah teachers with organizational trust, distributive justice, and psychological empowerment.	2021	Indonesia	Organizational trust significantly affects employee participation.
Sani et al.[45]	Influence of psychological empowerment on employee competence in Nigerian universal basic education system: The mediating role of work engagement.	2021	Nigeria	Psychological empowerment has a significant direct effect on employee participation, and employee participation positively influences employee competence.
Bani-Mustafa et al.[46]	Do individual factors affect the relationship between faculty intrapreneurship and the entrepreneurial orientation of their organizations?	2021	Kuwait	There is a positive relationship between the entrepreneurial orientation of faculty members and entrepreneurial orientation of their institutions.
Fayyaz et al.[32]	Developing a model for empowerment of faculty members in Islamic Azad University: a qualitative study.	2020	Iran	The authors designed a model for empowering faculty members of the Islamic Azad University.
Dehghanpour Farashah et al.[35]	Exploring the factors affecting work engagement decline of faculty members of public universities in Iran.	2020	Iran	The identified barriers decrease work engagement in faculty members of Iranian public universities.
Jafari et al.[36]	Exploring the components of the research empowerment program of the faculty members of Kermanshah University of Medical Sciences, Iran based on the CIPP model: A qualitative study.	2020	Iran	The authors identified components of the program designed for empowering faculty members in research areas.
Faridi et al.[34]	Designing a model for readiness assessment of higher education	2020	Iran	The authors designed a model to assess level of preparedness of higher education institutions for transition to third-

(*continued on next page*)

Table 1 (*continued*)

Authors	Title	Study year	Country	Results
	institutions to become a third generation university, a case study.			generation/innovator/entrepreneur universities.
Ariana and Daneshfard[2]	Explaining the empowerment indicators of the Technical and Vocational University based on the characteristics of the Entrepreneurial University (Case Study: Bandar Abbas Technical and Vocational University)	2020	Iran	The authors used the main characteristics of entrepreneurial universities to determine empowerment indicators of the Technical and Vocational University.
Amiresmaili et al.[7]	Identifying the effective factors on the transition to the third-generation university: A qualitative study.	2019	Iran	The authors identified five major factors accelerating transition of universities to third-generation universities.
Meng and Sun[30]	The impact of psychological empowerment on work engagement among university faculty members in China.	2019	China	Psychological empowerment enhances work engagement mainly through the dimensions of meaning and competence.
Sabet et al.	Investigating the organizational and psychological factors affecting the development and improvement of faculty members' job performance.	2017	Iran	Job motivation has the highest impact on faculty members' job performance.
Rahimi-Dadkan et al.[41]	Relationship among occupational adjustment psychological empowerment and job burnout in faculty members.	2016	Iran	There is a significant positive relationship between job adjustment and psychological empowerment of faculty members.
Alam et al.[47]	the relationship between empowerment, organizational justice and organizational citizenship behavior (OCB) in physical education faculty members of Islamic Azad University.	2016	Iran	Empowerment and perception of justice positively influence faculty members' organizational citizenship behavior.
Sadri et al.[48]	Evaluation of views of faculty members on effective strategies of empowerment and related factors in the Dental Branch of Islamic Azad University in 2014.	2016	Iran	The authors identified three major factors affecting faculty member empowerment.
Rahmani -and Ezati.[49]	Affecting Factors on Empowerment of Faculty Members from the Islamic Perspective.	2015	Iran	Managers can contribute to the empowerment of faculty members by maintaining human dignity and developing work ethic.
Rahimi et al.[31]	Faculty members' viewpoints on their empowering factors and developing a structured questionnaire.	2013	Iran	The authors determined important factors influencing the empowerment of university faculty members.
Guerrero et al.[50]	The development of an entrepreneurial university.	2012	Spain	The author assessed environmental and internal factors affecting the establishment and development of entrepreneurial universities.
Gholifar et al.[51]	Human resource development: Faculty members psychological empowerment in Iran's colleges.	2011	Iran	Professional skills and organizational culture have significant positive effects on psychological empowerment of faculty members.
Abd Elahi and Heydari[34]	Associated factors with the empowerment of the university's academic staffs.	2009	Iran	Job enrichment and participatory management are the best predictors of faculty member empowerment.
Antoncic[26]	The entrepreneur's general personality traits and technological developments	2009	Slovenia	The author examined major characteristics of entrepreneurs.

driving force triggering the transition from second- to third-generation universities. Participants believed that faculty members must easily establish relationships with society and industry and identify current needs of society. Besides establishing intra- and inter-organizational relationships, they should also communicate with other organizations at the international level. The participants highlighted the importance of teamwork ability as a major capability of faculty members and a key component of entrepreneurship. According to the majority of participants, the staff of a third-generation university must be able to analyze problems carefully, think critically, and solve problems with creative solutions. They also need to take risks and change their attitudes and thoughts if necessary. The participants believed that faculty members should acquire competencies such as the ability to receive research grants, manage knowledge, learn the existing technologies, and manage various projects.

Table 2: Demographic data of the study participants.

Variables	Number of participants
Sex	
Male	9
Female	2
Professional level	
Assistant	2
Associated	5
Professor	4
Department	
Pharmaceutics	1
Physics	1
Pediatrics	1
Agriculture	1
Medical nanotechnology	1
Social medicine	1
Anatomy	1
Occupational health engineering	1
Mathematics	1
Cellular science	2

Causal factors

The structure of the education system was identified as a crucial factor in empowering faculty members of third-generation universities. One of the main missions of a third-generation university is to train and educate successful future entrepreneurs; however, in the Iranian education system, the needs of society are not thoroughly considered when designing educational courses and curricula. Unfortunately, the Iranian education system emphasizes learning more than thinking and creativity. In addition, faculty member recruitment process and training and empowerment of young people were found to affect the empowerment of faculty members of third-generation universities.

Structural and contextual factors

The authors observed that the administrative structure and culture of universities affect the core phenomenon, which in turn has an impact on the action/interaction

Table 3: The results of open and axial coding processes performed to identify major characteristics of faculty members in third generation universities.

Axial coding	Main category	Subcategories	Open coding
Causal factors	Structure of education system	Traditional education	Education goals, skills and competencies, poor participation of students, grading system, college admission process, development of students with poor entrepreneurial skills
		Faculty member recruitment process	Changes in faculty member recruitment regulations, recruitment of entrepreneurial and creative people
		Training and empowerment of young people	Offering academic empowerment courses, offering national and international courses, organizing scientific entrepreneurship tours
Structural and contextual factors	Structure	Infrastructure	Budget, physical equipment and facilities, organizational structure
		Legal	High-level laws, internal laws and regulations, policies
		Administrative	Administrative bureaucracy, empowering environment, freedom of action, micromanagement
		Cultural	Culture building, entrepreneurial atmosphere, culture of laziness
	Relationship	Academic community	Fields of study, faculties, and universities
		Society	Society, social skills, identification of current needs of society
		Industry	Industry, technology, business
Intervening factors	Internal	Promotion and ranking system	Regulations for promoting the level of faculty members, regulations for promoting the rank of faculty members, evaluation indicators and criteria
	External	Trust	Lack of mutual trust between industry and university
Outcomes	Third generation university	Value creation	Revenue generation, entrepreneurship, wealth, employment, commercialization of science, knowledge-based systems, investment, value added, key product
		Independence	Dependence on public budget, dependence on government, financing
		Human resource training	Capable, skill-oriented, technology-oriented
		Decision making	

(*continued on next page*)

Table 3 (*continued*)

Axial coding	Main category	Subcategories	Open coding
			Considering social impact, solving community problems, meeting community needs, providing different services
Core phenomenon	Soft skills	Interdisciplinary approach	Interdisciplinary thinking
		Relationship establishment ability	Social relations, cooperation, international language, international relations
		Leadership	Team leadership, team building
		Mentorship	Mentor, spiritual relationship, confidant, moral values
		Identification of current needs of society	Needs assessment, community needs, impact on society
		Problem-solving ability	Recognizing the problem, solving the problem
		Risk taking	Risk, risk taking, courage
		Innovation and creativity	Ideation, new theory, new thoughts, creativity
		Motivation and thoughts	Attitude, intrinsic motivation, concern, thought, safety, privilege, justification
		Teamwork	Teamwork, collaboration, team building
		Critical analysis and thinking	Curiosity, constructive criticism, open-mindedness, inference
	Hard skills	Qualification for receiving research grants	Research grants
		Technological mastery	Technology-oriented, technology development
		Knowledge management	Information, study, book, integrated project management

strategies of organizations. Structure and relationship were identified as two subcategories of structural factors. The results indicated that the transition from second- to third-generation universities requires special infrastructure and atmosphere, as well as a fundamental transformation in the administrative, organizational, and legal structures of universities. Furthermore, today, many national, academic, provincial, and even organizational laws and regulations hinder the entrepreneurial activities of faculty members. In addition, the existing regulations for faculty member evaluation and promotion make it very difficult for faculty members to pursue entrepreneurship and to move towards third-generation universities.

Culture building was recognized as another important underlying cause of core phenomenon. University faculty members must realize the fact that they considerably influence the culture of society in which they live. Authorities must plan to foster the culture and atmosphere of wealth generation in universities. The authors identified relationship as another major underlying factor in the process of empowering faculty members of third-generation universities. The results showed that Iranian universities need to develop their relationships with industry and society to improve the entrepreneurial capabilities of their students, faculty members, and other staff.

Intervening factors

Promotion and ranking systems in universities and lack of mutual trust between industry and university were identified as major factors preventing faculty member empowerment and entrepreneur development. Lack of trust between industry and university decreases their mutual relationships, reduces the social impact of faculty members on society, and slows down the movement towards entrepreneurial and third-generation universities.

Outcomes

The main outcomes of faculty member empowerment and transition to third-generation universities included value creation, wealth creation, independence, human resource training, decision making, and social change production. According to the participants, the mission of third-generation universities is to contribute to economic and social development of societies. Finally, reduced dependence on a public budget was another positive outcome of faculty member empowerment in third-generation universities.

Discussion

This study adopted the grounded theory approach to design a conceptual model for empowering faculty members of Iranian universities of medical sciences. A conceptual model was designed to show the interrelationships among different factors affecting the empowerment of faculty members in third-generation universities. The model presented all causal, intervening, and structural and contextual factors influencing the core phenomenon. Some major factors affecting faculty member empowerment included structural/contextual factors (including structure of education system, recruitment, investment, and training and empowerment of young people) and intervening factors (including promotion and ranking systems in universities and lack of mutual trust between industry and university).

The study identified and described the main characteristics, skills, and abilities of faculty members of third-generation/entrepreneur universities. These characteristics

and skills included relationship establishment ability, leadership, mentorship, identification of current needs of society, problem-solving ability, risk taking, critical analysis and thinking, innovation, creativity and ideation, attitude, motivation and thoughts, teamwork, and interdisciplinary approach (soft skills) and marketing and qualification for receiving research grants, technological mastery, integrated project management, and knowledge management (hard skills). Therefore, university authorities must strive to enhance these skills in their faculty members. According to research, some characteristics of entrepreneurs include the need for success, locus of control, risk-taking potential, autonomy, commitment, perseverance, insight, creativity, self-esteem, popularity, physical attractiveness, sociability, intelligence, assertiveness, and diplomacy.[25] In addition, researchers argue that both general personality traits (including extraversion, emotional stability, openness to experience, satisfaction, and conscientiousness) and specific personality traits (including the need for success, risk-taking potential, innovation, autonomy, locus of control, and self-efficacy) can be associated with investment success.[26] Furthermore, communication skills, critical thinking and decision making, interpersonal interaction, negotiation, problem solving, self-confidence, self-management, teamwork, and valuable ethics are the most essential skills of entrepreneurs.[27]

The structure of the education system, faculty member recruitment process, and training and empowerment of young people were identified as the main causal factors affecting faculty member empowerment. The education offered by universities has great impact on students' career choices; thus, universities can be considered potential sources of future entrepreneurs. Currently, most universities are spending huge amounts of money to design efficient entrepreneurship education programs for their students. Entrepreneurship education is defined as "a set of training activities provided to students – either within or outside the formal education system –to encourage them to display entrepreneurial behaviors and develop their entrepreneurial knowledge, desirability, and efficiency." In addition, entrepreneurship education programs offered at various universities vary remarkably in nature, scope, and structure.[28] Most Iranian universities are second-generation and research-oriented universities; thus, Iran's Education System Transformation Plan mainly aims to develop third-generation universities across the country.[5] In Iran, the existing education system does not provide faculty members with necessary entrepreneurship training; therefore, authorities need to develop detailed investment and development programs to empower faculty members. Entrepreneur universities empower faculty members to go beyond the role of teachers and become prominent researchers, inventors, and entrepreneurs.[29] On the other hand, entrepreneur universities should only hire individuals with special entrepreneurial characteristics and traits. Meng and Sun[30] concluded that universities need to provide greater support to younger faculty members due to the existence of a strong positive correlation between psychological empowerment and work engagement. University authorities must create a supportive environment to facilitate the professional development of faculty members, and thereby boost the productivity of universities. The findings of Rahimi et al.[31] indicated that opportunities, information, support, and resources are great determinants of professor empowerment. Fayaz et al.[32] concluded that personal factors such as tendency to improve job quality, the feeling of inefficiency, lack of job promotion, job burnout, management factors such as managerial attitudes and behaviors, and factors related to occupation including job complexity and job requirements are among the causal factors of empowerment of the faculty members. Accordingly, by promoting positive attitude and increasing the level of education and skills, the system can pave the groundwork to remove negative emotions and improve the job quality of the faculty members.

In this study, the authors also identified intervening factors affecting the empowerment of faculty members in the path towards third-generation universities. Promotion and ranking systems in universities and lack of mutual trust between industry and university were identified as major factors preventing faculty member empowerment. Considering that the main mission of third-generation universities is to contribute to economic and social development of societies,[10] universities need to make fundamental changes in their internal affairs and activities to properly play their new role.[12] The emergence of third-generation (entrepreneur) universities and increasing unemployment of university graduates reveal the fact that traditional professor evaluation criteria can no longer effectively assess their actual capabilities. Entrepreneurial capabilities of universities are commonly measured to evaluate their overall performance.[4] Accordingly, the current system of evaluation and ranking of faculty members and universities must be revised and changed based on the indicators of third generation universities. A major goal of Iran's Education System Transformation Plan is to facilitate transition to entrepreneur universities; therefore, poor evaluation and ranking system prevents effective empowerment of faculty members and university faculty members. According to Kurt Lewin's theory of social change, restraining forces reduce the power of driving forces, and the balance can be disturbed by decreasing the restraining forces, increasing the driving forces, or both.[33] Therefore, these intervening factors must be modified and reduced to enhance faculty member empowerment (the core phenomenon). In this regard, relevant policymakers and authorities are suggested to develop necessary plans to remove existing obstacles. For example, they can sign inter-organizational agreements to boost the trust between industry and university, and therefore establish new relationships between university and industry.

Another result of the study was related to structural/underlying factors that, based on the findings of the study of administrative and organizational structure and culture, affect the main phenomenon and consequently the action/interaction strategies of organizations in empowering third generation university faculty members. The main structural/contextual factors affecting the empowerment of faculty members in the process of transition to third-generation universities included the administrative structure and culture of universities. These items affect the core phenomenon, which in turn has an impact on the action/interaction strategies of organizations. The development of an

entrepreneurial culture in a university improves the quality of entrepreneurial activities undertaken by its staff. Moreover, university authorities can reinforce commitment to development in staff by encouraging entrepreneurial behaviors. Authorities can also boost an entrepreneurial culture by recruiting employees with strong entrepreneurial backgrounds. Therefore, institutions should consider entrepreneurial attitudes and experience as important recruitment criteria. It should be noted that developing an entrepreneurial mindset is impossible without including entrepreneurial content in academic curricula.[6] This requires the radical transformation of existing infrastructure and administrative and organizational laws and regulations. The organizational structure of a third-generation university prepares the ground for achieving organizational goals, because it is flexible, decentralized, informal, and uncomplicated,[34] The establishment of a close relationship between industry and university reinforces the development of institutions operating in society. The experiences of successful and developed countries show how beneficial this relationship can be to various communities.[7] Ghorbani et al.[6] emphasized that the development of entrepreneurial culture in universities is considered a measure of entrepreneurial success. Entrepreneur universities are able to innovate, recognize and create opportunities, develop teamwork, take risk, and respond to all challenges. A proper understanding of entrepreneurial culture improves student attitude about entrepreneurial activities performed in academic settings. In their research, Dehghanpour et al.[35] stated the importance of organizational climate and culture. They argued that poor organizational climate of universities is a cultural barrier that hinders empowerment of the faculty members. Poor organizational climate has a crucial impact on the behavior, performance, commitment, and work engagement of faculty members. Absence of a positive climate, or in other words, lack of integration and unity among the individuals are among the cultural barriers against the empowerment of faculty members. In addition, the aforementioned study emphasized the importance of the relationship between professors and society. It argued that one of the barriers that hinders the empowerment of professors is failure to engage and utilize the knowledge of professors to improve the affairs in society and the feelings of lack of influence on resolving issues in society. Social isolation, or in other words, professors' perception of not being included in making decisions concerning issues to improve affairs of society, engenders the sense of negligence and inefficiency. Accordingly, it affects the level of energy and engagement of professors.[35] Relationship with society and industry are among the most crucial structural factors leading to faculty members' empowerment. Considering their role in the development of society, professors must be enjoying the required empowerment in the research organizations and institutions such that they can employ the results of studies in regard to society's improvement and health. Thus, a successful educational program to empower professors should take into account factors such as performance and modification as key factors to achieve effective results.[36] Therefore, education system authorities can facilitate the transition to creative universities by making fundamental changes in administrative structure of universities, recruiting entrepreneurial staff, and creating an atmosphere of trust and innovation..

Finally, the outcome of the core phenomenon was transition to entrepreneur universities with value-creating and wealth-generating faculty members who are able to train efficient entrepreneurs. These competent faculty members can take crucial decisions, make fundamental changes in society, reduce dependence of universities on public budget, and thereby contribute to transition to third-generation universities. Considering Kurt Lewin's force field theory, university authorities and planners are expected to create a balance between the restraining and driving forces to enhance faculty member empowerment, boost the productivity of the education system, and move towards third-generation universities.

Several factors affect the multifaceted and complicated phenomenon of faculty member empowerment at universities of medical sciences. However, capable faculty members are the key to the process of transition to third generation universities of medical sciences. As mentioned earlier, capable faculty members and faculty members possess a variety of skills. Chou et al.[37] emphasized that the main hard skills of entrepreneurs include human resource management, marketing, production, management, and financial skills. Other examples of entrepreneurs' soft skills include innovation, opportunity exploitation, information retrieval, concentration on high performance, work commitment, efficiency orientation, systematic planning, problem-solving ability, self-confidence, persuasion, influence, and assertiveness. However, in Iranian universities of medical sciences, many faculty members do not possess such skills, and although soft skills are not easily acquired through traditional methods, the existing skill development and faculty member empowerment plans primarily focus on hard skills.[38] In this regard, the organizational context of universities of medical sciences plays a key role. Organizational context is defined as opportunities and situational constraints affecting the type and occurrence of organizational behavior, as well as functional relationships among organizational variables.[39] The restraining and driving forces of faculty member empowerment emerge within organizational context. Based on studies, people tend to model their behavior based on previously approved behavioral models.[40] Observational learning is used to design these behavioral models.[41] Everything and everyone is a source of entrepreneurial learning for the entrepreneur. For entrepreneurs, everything and every person is a source of entrepreneurial learning. In other words, observing the failures or successes of others in the environment is a source of learning for entrepreneurs.[42] The experience of observing positive or negative reactions to innovative and entrepreneur faculty members influences other faculty members' intention to participate in programs related to third-generation universities in future.

Sending faculty members for short periods to the best international third-generation universities and using the experiences of faculty members of third-generation universities of medical sciences located in other countries can facilitate the transition of Iranian universities of medical sciences to third-generation universities. People tend to transfer the structural, cognitive, and communication contexts of their previous workplace to their new business environment.[43] These people

are expected to continue their activities within the cognitive framework of their previous workplace (the third-generation university) during their stay at Iranian universities of medical sciences. Then, faculty members of the host universities facilitate and accelerate movement towards third-generation universities by modeling their thoughts, behaviors, and judgments, and by developing the culture of entrepreneurship.

This study has some limitation. As already stated in the Research Methodology Chapter, the majority of participants of this research were male; thus, one probable limitations was the factor of sex. Future studies conducted by scientific societies and researchers should study the role of sex on the empowerment of faculty members. Another limitation of this research was the limited number of universities of medical sciences affiliated with the Ministry of Health and Medical Education. Taking into account that one of the universities of medical sciences was selected as the criterion for selecting the sample members, future studies should emphasize the possible dimensions and aspects of differences such as the effects of organizational culture on the empowerment of faculty members or a comparative study on the extent of empowerment of faculty members in the universities of medical sciences.

Conclusion

Considering the importance and position of faculty members in the process of the development of universities, the participation of empowered faculty members is essential to advance towards third-generation universities. Empowered faculty members play a vital role in this regard and the transition toward the concept of third-generation universities without them would be futile. Since empowerment of faculty members is a multifaceted and complicated phenomenon and is influenced by numerous factors, authorities should take measures to promote competencies and capabilities of faculty members to pave the way to develop third-generation universities. Designing comprehensive plans to intervene with the empowerment of the faculty members such as modifying the faculty member promotion plans, educating and changing the faculty members' beliefs and attitudes can facilitate this process.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

The research was approved by the ethics committee of Biomedical Research of Zanjan University of Medical Sciences (Ethics Code: IR.ZUMS.REC. 1398 .336). The participants voluntarily decided to participate in the study, and the interviews were recorded anonymously after obtaining permission from the participants.

Authors contributions

Conceptualization, methodology, L.N., M.M.; data collection and analysis, L.N., E.H., M.M. and K.H. M.J. and M.M. provided advice on the study design, methodology, data interpretation, and writing; K.H. and M.M. wrote the initial and final drafts of this paper. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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