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DOES DIVERSITY MAKE A DIFFERENCE? THE EFFECT OF PROFILE AND DIVERSITY OF ACADEMICS ON INNOVATION PERFORMANCE OF TURKISH UNIVERSITIES

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ABSTRACT

The concept of innovation includes good ideas and smart individuals. One of the most important driving forces for innovative ideas is human diversity. Diversity is a broad concept that includes physical characteristics like race, gender, ethnicity, and social and political differences of opinions. In this study, the effect of different specialties of employees on innovation performances has been researched in the context of universities. Recognizing the link between diversity, creativity and innovation, the concept of academic entrepreneurship is becoming increasingly important due to the changing role of universities in knowledge-based economies. The research has been conducted by analyzing the academicians' profiles of the first and last 15 universities of the "Index of Entrepreneur and Innovative Universities" which is announced by TUBITAK, presenting the innovation performances of universities. The academicians' profiles have been analyzed through their diverse specialties and their relevance with the ranking of the universities. The diversity factors of academicians were determined as gender, title, educational background, overseas experience, and work experience because of resume database scanning. Data were analyzed for presenting the relationship between innovation performance and organizational diversity. As a result, there is a significant relationship between overseas experience, educational background, and innovation performances in universities.

Key words: Organizational innovation, innovation performance, academic entrepreneurship, diversity management

JEL Classification: M14, O34, I23

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1. INTRODUCTION

Considering innovation problem with the macroeconomic approach, innovative skills are seen as an asset value for organizations. Creativity is the prior condition for successful innovation. The relationship between innovation and competitive advantage appeared with the help of research made and their conclusions. If an innovation process results in the novelty of an existing product, system or process and gaining favor for the social environment, all this success background depends on the individual or organizational creativity (Bassett-Jones, 2005). The main source of both individual and organizational creativity is the diversity factors that distinguish individuals from each other and make them think differently from each other beyond any doubt. Diversity is a broad concept that includes physical characteristics like race, gender, ethnicity, and also social and political differences of opinions. To understand the innovation, one should also focus on these diversity factors along with the skills (Page, 2007). Because innovation is an interactive process and diversity affects the knowledge's formation and manner of application to the innovation process, diversity between interacting individuals also encourages the innovation process (Østergaard et al., 2011).

Innovation is not something that comes up accidentally or periodically as a result of an action. According to many scholars, innovation is a result of an organization's linear interaction process with its macro-environment (Kline and Rosenberg, 1986; Dosi et al., 1988; Lundvall, 1988, 1992; Nelson, 1993; Edquist, 1997; Maskell and Malmberg, 1999; Lundvall et al., 2002; Leitão, 2006; Silva and Leitão, 2007; Silva et al., 2007). This macro environment includes state, university, supporting institutions, similar institutional agencies and ecosystems involving society. On the contrary, considering organizations at the micro level, the answer for the question "who is the source of innovation?" appears as a human brain. It means the more diverse people in an organization, the more different points of view and ideas. There is a strong relationship between diversity management and innovation; this link has been relatively well-explored in recent years (Benschop, 2001; Bassett-Jones, 2005; Gratton et al., 2007). Therefore, a successful policy which innovation supports at the macro level is dependent on organizational structures which support organizational diversity. This proves the necessity of micro level studies among innovation ecosystem development.

In addition to this, studies reviewing diversity are few in the general context of the service industry and especially in universities (Easingwood, 1986; Griffin, 1997; Oke, 2004; Morrison et al. 2005 in Luring and Selmer, 2011:347). So that education is an intangible service, it is hard for innovative ideas to appear, spread and get evaluated as innovation (Oke, 2004:31). But given in view of an increasing number of students, sector development and competition, universities should have a heterogeneous structure to improve themselves. In this regard, it is anticipated that universities, which include academicians with different specialties would have higher innovation performances.

2. THE CONCEPTS OF INNOVATION, ORGANIZATIONAL DIVERSITY AND ACADEMIC ENTREPRENEURSHIP

When examining the origin of the word innovation, it is seen that it stands on the saying “innovation”, derives from the verb “innovate” means, “change, vary, renew” in Latino. The concept of innovation is generally mistaken with the concepts of “invention, discovery” and perceived differently from its nature. Used in this meaning when it first came up, nowadays this concept’s meaning has been changed into developing and improving a product or service by making changes. The concept of innovation, which was examined as a process by Schumpeter, has been defined as creating new alternatives about new products, services and business processes and applying them (Schumpeter, 1934: 65 in Çapraz et al., 2014:26). In the most general definition, innovation can be described as converting an invention into value. In Oslo Manual, innovation is defined as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations” (Oslo Manual, 2005:10). Innovation is the most reliable and constant area to gain competitive advantages both organizationally and societally. Organizations, which can use these areas well would advance in the future more powerfully from now (Kelley and Littman, 2005; Yalçınkaya, 2010: 382).

Overtopping in innovation can be carried out when organizations use the resources they own effectively or with the help of their organizational characteristics. Robbins and Coulter (2012:195) discuss the driving forces of innovation in three main dimensions called as structural, cultural, and human resource variables. In the model that they developed in this framework, organic structures, abundant resources, high inter-unit communication, minimal time pressure and work/non-work support as structural variables; acceptance of ambiguity, tolerance of the risk, tolerance of conflict, focus on ends, open-system focus and positive feedback as cultural variables; high commitment to training and development, high job security and creative people as human resource variables are included. As Woodman et al. (1993:309) stated, to understand organizational creativity; the ways that creativity process, creative product, creative conditions, creative person and all of these factors interact with each other also should be understood. For innovation to take place in an organization, all these factors should come together.

Many individuals think that innovation requires smarter people and much better ideas. Starting from this point of view, “diversity” comes up as the most powerful but less understood component of innovation. According to the literature of innovation, it is seen that this concept is fed with diversity and discrepancy. These discrepancies sometimes might come up as ethnicity, gender, race, political view or religious beliefs. “Diversity” or “Diversity Management” is a concept that emerged with the increasing tendency of globalization circa the 90s. Diversity management points out the balance of the intensity rising from the employee

diversity and the conception of taking the advantage of this diversity. Discrepancies, which this understanding is aiming, state both the intrinsic and extrinsic characteristics that make them dissimilar or similar and defined as “differences existing between people in terms of race, culture, gender, sexual orientation, age or physical abilities and etc.” (Sürgevil and Budak, 2008). Diversity management is quite important because when employees join to a new corporation, they bring in their ethnic background as well as they bring their many characteristics (Robbins and Judge, 2013). Diversity management is an application that provides an advantage to an organization if implemented properly (Cox and Blake, 1991).

When the literature is examined, it is seen that the concept of diversity management is a new concept. Diversity management, which is mostly examined in terms of business, is a concept that might provide an advantage to universities if managed properly. An increase of diversity is also effective in universities for innovations to come out and different information production to occur as well as it is effective in other organizations. According to Bridgstock et al. (2010), diversity management can be defined as a management philosophy that includes accepting and valuing heterogeneity in organizations in order to increase organizational performance.

The term ‘diversity’ encompasses a range of differences in ethnicity/nationality, gender, function, ability, language, religion, lifestyle or tenure (Kossek and Lobel, 1996). Additionally, ‘diversity’ in the workplace includes more than employees’ diverse demographic backgrounds and takes in differences in culture and intellectual capability. It takes more than demographic or ethnic diversity to result in creativity that leads companies to perform better (Leonard and Swapp, 1999). From a relational perspective, one important consideration is the notion of individual capital (Özbilgin and Tatli 2005). Aydın and Rahman (2017) argue that the concept of diversity brings a multi-ethnic, multi-racial, and multi-cultural perspective to organizations because that concept creates an awareness of diverse populations both in workplaces and commercial markets. Loden and Rosner’s (1991) model called as “diversity wheel” has *core factors* that motive the individuals’ points of view in their lives and sorted these factors as age, ethnicity, gender, race, sexual orientation, and physical abilities/characteristics. They also stated that these factors influence people’s expectations, beliefs and life experiences deeply. On the outer layer of the wheel, there are *secondary factors* that express less individual characteristics than core factors and they are stated as educational background, level of income, marital status, work experience, military service experience, religious beliefs and geographic location. On the other hand, Robbins and Coulter (2012:128) have similarly explained workplace diversity with the concepts of deep-level diversity including values, personality and differences on work preferences and surface-level diversity including age, race and gender. In this analysis, it is stated that deep-level diversity factors affect employees’ communication, organizational work understanding, how they react to the leaders, how they compromise and in general how they act in the workplace,

and on the other hand surface-level diversity factors can easily be observed but they are stereotyped characteristics which do not express people's feelings or thoughts. In addition to this, it is possible to come across to many studies which are about the sources, types and results of diversity in organizations. As Jackson et al.'s (1995) diversity typology, diversity factors are divided into two groups as task-oriented and relations-oriented diversity. Relations-oriented variables include distinguished demographical factors as gender, age, race and ethnicity. Task-oriented variables include factors as function, seniority and education which include knowledge and skills required in the workplace.

As it can bring out advantages and disadvantages at the same time, organizational diversity is a very important concept to manage. Aydın and Rahman (2017) categorize two different perspectives to diversity management. These are "business case for diversity" and "ethical case for diversity". While "business case" examines diversity as a tool that creates an opportunity to attain efficiency and effectiveness, ethical case on the other hand, depicts organizational virtue—a good life, happiness, and integrity. According to Syed and Özbilgin (2009), there are a number of interrelated factors at multiple levels of analysis influencing diversity outcomes in organizations. There are some researches of the negative effects of diversity in the workplace like more conflict, (Knight et al., 1999), higher turnover, less social integration (O'Reilly et al, 1989) and more problems with communication (Williams and O'Reilly, 1998), lower levels of attachment to employing organizations on the part of individuals who perceive themselves to be different from their co-workers (Tsui et al., 1992; Mighty, 1997). On the other hand, there are numbers of studies of positive impacts of diversity in the workplace.

Employee diversity is often considered to be positive since it might create a broader search space and make the firm more open towards new ideas and more creative. Ideally, diversity should increase a firm's knowledge base and increase the interaction between different types of competencies and knowledge (Østergaard et al., 2011:500). Østergaard et al. (2011) argue that firms with diversity in the skills, knowledge and experiences among their employees increase the possibilities for new combinations of internal knowledge through interaction and learning. Furthermore, different points of view educational backgrounds and experiences promote better problem solving and the generation of new ideas. Their study of 1648 Danish firms shows that there is a relation between employee diversity based on the characteristics of all employees and the firms' likelihood to innovate. The research in this field suggests that diversity in teams is correlated with innovation potential and outcome. According to Jones (2005:173), teams with a diverse membership and a collectivist orientation are likely to have a deeper well of resource upon which to draw when generating ideas, combining them and subjecting them to critical evaluation. Some diversity issues, ethnicity age, gender, personality and educational background increase creativity and problem-solving capability of employees (Latimer, 1998). There is a strong relationship between diversity management and innovation; this link has been relatively well-explored in recent years (Benschop, 2001; Bassett-Jones, 2005;

Gratton et al., 2007). The research results of Gratton et al. (2007), Bassett-Jones (2005) and Benschop (2001) suggests that diversity in teams is correlated with innovation potential and outcomes. Bridgstock et al. (2010) argued that there is potential for diversity management to contribute to social enterprises, in the interests of the maximization of innovation and business performance.

In the inter-organizational context, innovativeness leads the concept of entrepreneurship. For the universities and academic staff the concept of academic entrepreneurship is becoming increasingly important due to the changing role of universities in knowledge-based economies. The reason for this interest revolves largely on the economic benefits arising from the commercialization of scientific and technological knowledge (Storey and Tether, 1998). Siegel and Wright (2015) emphasize that academic entrepreneurship, which refers to efforts undertaken by universities to promote commercialization on campus and in surrounding regions of the university, has changed dramatically. In light of the evolution in academic entrepreneurship, the emerging view is based on the reason to provide a wider social and economic benefit to the university ecosystem. Key elements of the broadened entrepreneurial university ecosystem include (Siegel and Wright, 2015:4): (1) the rise of property-based institutions, such as incubators/accelerators and science/technology/research parks, to support technology transfer and entrepreneurship; (2) substantial growth in the number of entrepreneurship courses and programs on campus (in multiple colleges/schools); (3) the establishment and growth of entrepreneurship centers; (4) a rise in the number of ‘surrogate’ entrepreneurs on campus to stimulate commercialization and startup creation; and (5) a rapid increase in alumni support of various aspects of this entrepreneurial ecosystem, including alumni commercialization funds and student business plan competitions.

When the entrepreneurship literature is examined, the importance of individual differences in starting an enterprise has been revealed by many authors (Shane and Venkatamaran, 2000; Nicolaou et al., 2008). In addition to this finding, Shane (2010) emphasized that individual differences in entrepreneurship should be handled in two types, genetics and experience. In addition, it was stated that the experience of explaining an interventional activity in his study was significant in terms of turning to other interventional activities. This finding regarding the expressed entrepreneurship experience has been confirmed by other studies (Brennan and McGowan, 2006).

Academic entrepreneurship is handled from a corporate entrepreneurship perspective within the framework of appropriate frameworks and conceptualizations of entrepreneurship in a university environment (Demirtaş 2014:193). Sharma and Chrisman (2007), who viewed academic entrepreneurship from a corporate entrepreneurship perspective, claimed that the three phenomenon types constituted a core focus. These are emphasized as corporate initiative, strategic renewal and innovation. While making this categorization, the assumption that academic entrepreneurship is based on producing and using

valuable information is taken into consideration. Such a distinction is considered valuable because it accepts the existence of different types of information (Cook and Brown, 1999). When looked at the literature in general, it can be emphasized that academic entrepreneurs evaluate their high potential areas in their disciplines and complementary disciplines (Miles and Covin, 2002), academics perform activities in their disciplines in new ways (Tidd and Bessant, 2018), and seek new perspectives, and either realize an advanced challenge in academic studies or, if this is not possible, effectively reveal new limits of their disciplines (Hitt et al., 2001).

Recognizing the relations between diversity, creativity, innovation, and competitive advantage has motivated both academicians and business professionals to research the factors which affect the individual's creativity (Van de Ven, 1986). However, it is likely to find numerous studies on the sources, types, and results of organizational diversity. According to the study of Jackson et al., which examines the 63 different studies in this area which are conducted between 1997 and 2002, when organizational diversity is high, it affects individuals' and teams' behavioral reactions in short term and brings to a successful conclusion in long term. Individual-level reactions that come to the forefront in this study are symphysis, satisfaction and commitment while team level reactions are communication, conflict and collaboration. Results in long term are also stated as performance, turnover rate, promotion and compensation (Jackson et al., 2003:803). Van der Vegt and Janssen (2003) suggest that task and goal commitment of heterogeneous groups have contributions in terms of innovative behaviors. It is seen that homogeneous groups are less innovative than heterogeneous groups (Van der Vegt and Janssen, 2003). The effects of interdependency and mutual attachment come out with teams becoming more diverse (Van der Vegt and Janssen, 2003).

It is anticipated that academic diversity would contribute to developing academic studies with scientific creativity, interdisciplinary, intercollegiate and collaboration between universities and industry projects. Managing diversity is a continuous process that liberates a variety of abilities and capabilities. When there's a diverse population in an organization, community or society, it creates a special structure that makes this distinctness feel safe. An environment like this would maximize individuals' potentials and creates a cultural environment for everyone to avail (Rosado, 2006).

3. METHODOLOGY

The aim of this study is to reveal the effects of academic profiles and academic diversity on innovation performance in universities. For this purpose, the academics of first 15 and last 15 out of 50 universities in the EIUI "Entrepreneurial and Innovative Universities Index" list which is issued annually by TUBITAK (Scientific and Technological Research Council of Turkey)

considering the dimensions of ‘Culture of Entrepreneurship and Innovation’, ‘Competence of Scientific and Technologic Research’, ‘Intellectual Property’, ‘Collaboration and Interaction’, ‘Economic Contribution and Commercialization’ has been analyzed. Regarding these analyses which contains the age, gender, experience, educational background of academicians, the relations between these features; diversity based on these features and innovation performances have been examined. This index has been constituted with the data gathered from the Ministry of Science, Industry and Technology, KOSGEB (Small and Medium Sized Enterprises Development Organization), TTGV (Technology Development Foundation of Turkey), TUBA (Turkish Academy of Sciences) and universities. Index values of the year 2015 can be seen in Table 1.

Table 1. List of Entrepreneurial and Innovative Universities of The Year 2015

Rank	Total Score	Competency of Scientific and Technologic Research	Intellectual Property Pool	Collaboration and Interaction	Entrepreneurship and Innovation Culture	Economical Contribution and Commercialization
1	88,40	19,9	11,3	25,0	13,5	18,8
2	85,96	19,7	11,4	23,1	13,1	18,8
3	79,66	18,0	8,8	24,7	9,4	18,8
4	78,10	16,4	8,2	25,0	11,0	17,5
5	76,44	16,6	10,9	23,8	7,8	17,4
6	74,94	15,5	6,4	22,3	12,0	18,7
7	73,47	16,5	6,9	21,8	11,7	16,6
8	70,49	19,5	7,7	22,2	8,6	12,5
9	66,56	16,2	12,9	18,4	7,5	11,5
10	63,93	10,5	10,6	19,0	12,0	11,9
11	60,43	18,1	3,8	19,8	1,3	17,5
12	59,11	10,6	10,9	13,9	12,3	11,4
13	56,43	11,7	3,8	13,6	14,8	12,6
14	54,37	12,6	8,2	14,8	9,8	9,0
15	54,26	11,5	4,0	17,5	13,7	7,6
16	53,17	7,0	6,0	15,7	13,5	11,0
17	51,21	11,2	7,5	18,1	2,2	12,2
18	49,50	11,4	5,6	11,6	13,4	7,5
19	46,87	8,3	7,7	14,0	7,6	9,3
20	45,52	10,5	11,9	12,8	4,0	6,3
21	44,83	7,1	5,2	11,9	11,1	9,6
22	43,13	10,7	1,6	14,6	7,3	9,0
23	43,03	9,1	1,8	14,6	10,9	6,6
24	42,87	10,2	4,8	7,9	12,0	8,0
25	42,63	10,0	9,5	14,2	6,0	2,9
26	41,78	9,1	1,5	15,1	6,6	9,3
27	41,27	7,6	1,4	12,6	4,7	14,9
28	40,61	10,3	4,7	10,9	4,4	10,3
29	40,45	10,9	1,4	13,2	10,1	4,8
30	40,25	8,8	5,5	13,0	7,5	5,5
31	39,36	8,9	3,2	9,3	12,2	5,8
32	38,40	11,7	1,1	12,6	7,5	5,4
33	38,36	8,5	5,7	14,0	5,7	4,5
34	36,73	6,2	3,8	10,2	5,2	11,3
35	35,76	9,7	3,9	7,8	7,1	7,2
36	35,75	5,8	2,4	13,9	9,0	4,6

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37	34,15	9,0	0,0	17,1	3,9	4,2
38	34,08	7,6	6,4	14,0	6,1	0,0
39	33,98	8,5	3,1	12,0	5,0	5,4
40	33,67	3,9	9,0	8,6	7,7	4,4
41	33,25	4,9	7,5	7,1	7,1	6,7
42	33,15	6,6	3,0	9,6	8,5	5,5
43	33,14	8,4	3,8	10,1	7,1	3,8
44	32,94	8,1	5,2	4,9	2,9	11,9
45	32,12	8,5	1,8	6,3	10,9	4,6
46	31,60	11,2	3,6	12,9	1,9	2,0
47	30,92	8,6	3,8	11,1	7,5	0,0
48	30,12	8,7	2,6	10,4	4,4	4,1
49	30,09	8,5	1,5	8,0	4,9	7,3
50	30,04	10,9	0,8	6,8	7,0	4,6

According to YOK (Council of Higher Education) data of the year 2014, 152 universities which have more than 50 Assist. Prof + Assoc. Prof + Prof. were included to the evaluation.

* The sum of Assist. Prof + Assoc. Prof + Prof. were used normalizing the data (Culture of Entrepreneurship and Innovation dimension is not normalized). * Min-max method was used for standardizing the data.

* Weight: First dimension: 20, Second dimension: 15, Third dimension: 25, Fourth dimension: 15, Fifth dimension: 25

Source: TUBITAK, Scientific and Technological Research Council of Turkey
http://www.tubitak.gov.tr/sites/default/files/gyue2015_siralama.pdf

Table 1 indicates that the list is prepared by using the data of YOK (The Council of Higher Education) and the universities which have less than 50 of total numbers of professor, associate professor and assistant professor were not included in the analysis.

Table 2. Dimensions of Entrepreneurial and Innovative University Index (EIUI)

<p>Dimension 1. Competency of Scientific and Technologic Research (Weight Ratio: %20)</p> <ul style="list-style-type: none"> • number of scientific publications • number of projects on research-development and innovation programs • the amount of funds gained by research-development and innovation projects • number of citation indexes • the number of national and international science awards • number of PhD graduates
<p>Dimension 2. Intellectual Property Pool (Weight Ratio: %15)</p> <ul style="list-style-type: none"> • number of applications for patents • number of patent specifications • number of industrial design or utility model registration • number of applications for international patents
<p>Dimension 3. Collaboration and Interaction (Weight Ratio: %25)</p> <ul style="list-style-type: none"> • the number of research-development and innovation projects of university-industry collaboration • the amount of funds gained by the research-development and innovation projects of university-industry collaboration • the number of research-development and innovation projects of international collaboration • the amount of funds gained by the research-development and innovation projects of international collaboration, • the number of academic staff/student in exchange
<p>Dimension 4. Entrepreneurship and Innovation Culture (Weight Ratio: %15)</p> <ul style="list-style-type: none"> • the number of courses on entrepreneurship, technology management and innovation management on the undergraduate degree • the number of full-time staff under the control of Technology Transfer Center, technopark, incubators and Technology Development Center • the existence of the organizational structure of the technology transfer office • the number of training/certificate programs on entrepreneurship, technology management and innovation management for the external environment of the university

Dimension 5. Economical Contribution and Commercialization

- the number of actual firms owned or jointly run by academicians in Technology Transfer Center, technopark, incubators and Technology Development Center,
- the total number of actual firms owned or jointly run by existing students or maximum 5 years graduates in Technology Transfer Center, technopark, incubators and Technology Development Center,
- the number of staff working in the firms owned or jointly run by academicians in Technology Transfer Center, technopark, incubators and Technology Development Center,
- the number of licensed patent, industrial design or utility model

Source: TUBITAK, Scientific and Technological Research Council of Turkey,
https://www.tubitak.gov.tr/sites/default/files/gyue_gosterge_seti_1.pdf

According to the TUBITAK's EIUI scale, the most entrepreneurial and innovative universities of Turkey is being publicized since 2012. By listing universities and measuring their performances, this index contributes to the development of an entrepreneurial and innovative ecosystem. Institution of Higher Education, Turkish Statistical Institute, Ministry of Industry and Technology, Turkish Academy of Sciences, Ministry of Development, Small and Medium Sized Enterprises Development Organization and universities cooperatively worked through of it. This scale contains five dimensions and 23 components. These are shown in Table 2, and they are very important to understand the main elements that are important for measuring “to be an innovative and entrepreneurial university in Turkey”.

The first dimension of competency of scientific and technologic research is weighted as a percentage of 20 and included the six components of the number of scientific publications, projects on research-development and innovation programs, citation index, national and international science awards, PhD graduates and the amount of funds gained by research-development and innovation projects. The second dimension of the intellectual property pool is weighted as a percentage of 15. The main components in this dimension are the number of applications for patents, patent specifications, industrial design or utility model registration and applications for international patents. Dimensions of collaboration and interaction which has a higher weight as a percentage of 25 include the number of research-development and innovation projects of university-industry collaboration, research-development and innovation projects of international collaboration, and academic staff/student in exchange as well as the amount of funds gained by the research-development and innovation projects of university-industry collaboration and funds gained by the research-development and innovation projects of international collaboration. The fourth dimension of entrepreneurship and innovation culture is weighted as a percentage of 15. The four components in this dimension are the number of courses on entrepreneurship, technology management and innovation management on an undergraduate degree, the number of full-time staff under the control of Technology Transfer Center, technopark, incubators and Technology Development Center, the existence of the organizational structure technology transfer office, the number of training/certificate programs on entrepreneurship, technology management and innovation management for the external environment of the university. The last and other higher weighted dimension is economical

contribution and commercialization includes the number of actual firms owned or jointly run by academicians in Technology Transfer Center, technopark, incubators and Technology Development Center, the total number of actual firms owned or jointly run by existing students or maximum 5 years graduates in Technology Transfer Center, technopark, incubators and Technology Development Center, the number of staff working in the firms owned or jointly run by academicians in Technology Transfer Center, technopark, incubators and Technology Development Center, the number of licensed patent, industrial design or utility model.

Table 3. The First 15 and The Last 15 Universities in The List of TUBITAK's EIUI Scale (Year of 2015)

1. Sabancı University	36. Bahçeşehir University
2. Middle East Technical University	37. Kadir Has University
3. Boğaziçi University	38. Düzce University
4. Bilkent University	39. Izmir Economy University
5. Koç University	40. Okan University
6. Istanbul Technical University	41. Gediz University
7. Özyegin University	42. Pamukkale University
8. Institute of Izmir High Technology	43. Marmara University
9. TOBB Economy and Technical University	44. Mersin University
10. Yıldız Teknik University	45. Fırat University
11. Gebze Teknik University	46. Gaziosmanpaşa University
12. Selçuk University	47. Zirve University
13. Erciyes University	48. İnönü University
14. Hacettepe University	49. Eskişehir Osmangazi University
15. Ege University	50. Atatürk University

Source: TUBITAK, Scientific and Technological Research Council of Turkey, http://www.tubitak.gov.tr/sites/default/files/gyue2015_siralama.pdf

In order to evaluate the diversity levels in universities, the titles, gender ranges, educational backgrounds, overseas experiences, work experiences and areas of expertise of academics were examined by analyzing the CV databases of universities. It was emphasized on task-based diversity variables which were stated by Jackson et al. (1995), only gender variable came up from the relationship-based variables. Later, the data were analyzed in SPSS to examine the effects on innovation performances of the first and last 15 universities in the list of TUBITAK EIUI 2015. These 30 universities are listed in Table 3.

Range of Academic Title. Considering the diversity through academics, it can be said that the most important discrepancy is based on titles. Academic titles are the indicators of knowledge and experiences among scientists. It is anticipated that these discrepancies would reflect on knowledge, and experience would affect the

innovation performances of the universities. Accordingly, the academics of the first and last 15 universities were examined in the context of their academic titles.

Range of Gender. The number of male and female academics was also considered while examining the academicians. As Page (2007) mentioned, gender has an important place when it comes to diversity among the factors effecting innovation. Likewise, as Murrell and James (2001) stated, rich gender diversity and the encouragement resource of this diversity creates a positive impact on workplaces.

Range of Educational Background. In their studies on diversity, Tihanyi et al. (2000) stated that a good education is effective in terms of both management and teams. Likewise, as Østergaard et al. (2011) stated getting knowledge and having a strong knowledge background is important for organizations in terms of determining the innovative capabilities. The situation which is explained in this way in businesses in the private sector is also important in academia. Academicians were examined for the education in terms of different universities and different departments including the place and area of education. With the aim of gathering this data, it is searched whether the academicians have graduated from the same or different universities, faculties and departments and evaluated through this information. While evaluating, if the person has graduated from the same university, faculty, or department which they work currently, the diversity score has been given as 0, if not 1. As a result of this, diversity scores have been determined in total.

Overseas Experience. The overseas experience was both evaluated for work and education. It is examined whether an academic has studied abroad during bachelors, masters or PhD education. Likewise, work experience was also evaluated. While evaluating overseas experience, if an academic has been graduated abroad or worked abroad, the score was given 1, if not 0.

Work Experience. Besides overseas work experience, a general work experience of an academic has also been examined. It was examined whether they have worked in another university, different faculty, or department or in the private sector. Quintana-Garcia and Benavides Velasco (2008) defended those different points of view, educational backgrounds and work experiences ease the exploratory competence of the problem-solving process and suggesting new ideas.

4. FINDINGS

Diversity data of the 30 universities included in the study were examined considering the variables above. Correlation, regression, and discriminant analyses were conducted to the data obtained. Findings are summarized separately for each variable.

Table 4. Range of Academic Titles

Academic Titles													
Rank	# of Assist. Prof.	%	# of Assoc. Prof.	%	# of Prof.	%	Rank	# of Assist. Prof.	%	# of Assoc. Prof.	%	# of Prof.	%
1	127	24	159	28	266	48	36	91	45	47	23	65	32
2	83	40	48	23	78	37	37	91	53	39	23	41	24

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3	64	26	76	31	102	42	38	67	57	8	7	43	36
4	102	71	19	13	23	16	39	72	58	14	11	38	31
5	28	31	24	27	37	42	40	49	44	21	19	42	38
6	85	49	47	27	42	24	41	268	62	85	20	81	19
7	40	37	26	24	42	39	42	94	63	27	18	29	19
8	178	43	86	21	154	37	43	20	38	17	33	15	29
9	343	31	254	23	496	45	44	394	45	248	29	225	26
10	N/A	N/A	N/A	N/A	N/A	N/A	45	315	46	131	19	240	35
11	338	51	141	21	187	28	46	434	43	260	26	310	31
12	469	44	249	23	353	33	47	79	56	25	18	38	27
13	219	33	154	23	291	44	48	261	61	79	19	85	20
14	456	26	427	24	874	50	49	683	41	352	21	631	38
15	466	27	345	20	887	52	50	297	39	173	23	283	38
Total -15	2998	38	2055	24	3832	38	Total 36-50	3215	50	1526	21	2166	29

N/A: refers to no available data.

Range of Academic Title. As seen in the Table 4, the percentage of assistant professors is placed on top for the last 15 universities. The academic title information of the 10th university could not be found. In the first 15 universities, it can be said that there is no prepotency of one academic title. While the percentage of the professors is placed on top in the 5 out of the first 15 universities, the assistant professors are on top in the other 4. For the last 15 universities, the percentage of assistant professors is placed on top for all. It is seen that the professor percentage of the universities which are placed at the top of the index is higher than others. The significant point according to the data is that the percentage of associate professors is not placed at the top in any universities.

Range of Gender. When the range of gender for the first and last 15 universities are examined, as seen in the Table, it is possible to talk about an equal percentage for all. For both the first and last 15 universities, there is a male-dominant range. It is seen that the percentage of the male is high for the 9 out of the first 15 universities. In the 8 out of last 15 universities the percentage of the male is higher, for 1 university the percentages are equal and for 1 university the percentage of the female is higher. There are only 2 universities (2nd and 14th) which the percentage of females is higher (seen in the Table 5).

Table 5. Range of Gender

Range of Gender									
Rank	Female	%	Male	%	Rank	Female	%	Male	%
1	242	44	310	56	36	95	47	108	53
2	113	54	96	46	37	85	50	86	50
3	80	33	162	67	38	54	46	64	54
4	61	42	83	58	39	47	38	77	62
5	23	26	66	74	40	32	29	80	71

6	60	34	114	66	41	108	25	326	75
7	51	47	57	53	42	39	26	111	74
8	131	31	287	69	43	20	38	32	62
9	362	33	731	67	44	315	36	552	64
10	99	37	166	63	45	347	51	339	49
11	199	30	467	70	46	309	29	753	71
12	258	24	813	76	47	68	48	74	52
13	216	33	448	67	48	108	25	317	75
14	920	52	837	48	49	736	44	930	56
15	818	48	880	52	50	274	36	479	64
Total-15	3633	38	5517	62	Total 36-50	2637	38	4328	62

Educational Background. Considering the diversity of educational background in Table 6, data of the first and last 15 universities show parallelism and there is no relation between the educational background diversity and the score of entrepreneurship and innovation. All in all, the score of educational background diversity of 8 out of the first 15 universities are higher than the last 15 universities. But when considering this diversity, it should also be considered whether the universities are public or foundation.

Table 6. Educational Background

Educational Background									
Rank	BA/BSc	MA/MSc	PhD	Total	Rank	BA/BSc	MA/MSc	PhD	Total
1	0,5	0,77	1,4	2,66	36	1,45	1,44	1,31	4,19
2	1,35	1,53	2,05	4,05	37	1,52	1,49	1,45	4,46
3	1,16	1,15	1	3,32	38	1,42	1,43	1,36	4,21
4	2,36	2,34	2,27	6,65	39	1,5	1,4	1,34	4,24
5	2,24	2,09	2,19	7,8	40	1,18	1,21	1,05	3,44
6	2,43	2,34	2,37	6,83	41	N/A	N/A	N/A	N/A
7	1,34	1,32	1,28	3,94	42	1,23	1,23	1,17	3,62
8	1,64	1,95	2,35	5,94	43	1,64	1,48	1,64	3,69
9	0,43	0,73	1,03	2,19	44	1,48	1,34	1,32	4,12
10	1,57	1,32	2,21	5,1	45	1,44	1,38	1,27	4,08
11	2,42	1,90	2,24	6,56	46	1,58	1,30	1,73	4,61
12	1,43	1,21	0,91	3,55	47	2,71	2,40	2,65	7,77
13	1,12	1,29	1,49	3,90	48	2,32	2,63	3,08	8,03
14	1,77	2,07	1,87	5,71	49	1,13	1,22	1,06	3,41
15	1,17	1,24	1,08	3,49	50	1,91	2,25	1,42	5,58
Total 15	1,51	1,54	1,71	4,77	Total 36-50	1,61	1,58	1,56	4,67

N/A: refers to no available data.

Overseas Education Background. As on Table 7, there is a difference between the first and last 15 universities when it comes to studying abroad at the bachelor's level. The number of academics who studied the bachelor's level abroad is quite low. For the master's degree this number is increasing and for PhD it is at the top level. When both the first and last 15 universities are examined, the highest number of overseas educations is seen in PhD level. However, it can be said that there is a positive correlation between overseas education diversity and entrepreneurship and innovation scores. Because the score of overseas education level in each level and general of first 15 universities is higher than the last 15.

Table 7. Overseas Educational Background

Overseas Educational Background									
Rank	BA/BSc	MA/MSc	PhD	Total	Rank	BA/BSc	MA/MSc	PhD	Total
1	0,05	0,23	0,59	0,86	36	0,07	0,24	0,36	0,67
2	0,16	0,51	0,87	1,28	37	0,09	0,33	0,5	0,92
3	0,06	0,22	0,48	0,76	38	0,04	0,21	0,54	0,79
4	0,11	0,43	0,75	1,23	39	0,1	0,27	0,31	0,68
5	0,08	0,41	0,64	0,98	40	0,2	0,01	0,04	0,26
6	0,05	0,38	0,53	0,91	41	N/A	N/A	N/A	N/A
7	0,06	0,17	0,4	0,62	42	0,11	0,2	0,4	0,75
8	0,04	0,11	0,2	0,35	43	0	0,03	0	0,02
9	0,07	0,26	0,67	0,99	44	0,02	0,14	0,22	0,38
10	0,17	0,53	0,63	1,33	45	0,02	0,07	0,12	0,21
11	0,01	0,05	0,06	0,12	46	0,01	0,03	0,04	0,08
12	0,01	0,05	0,11	0,17	47	0,04	0,16	0,07	0,27
13	0,01	0,06	0,04	0,11	48	0,02	0,12	0,07	0,21
14	0,04	0,13	0,22	0,39	49	0,01	0,08	0,06	0,15
15	0,05	0,06	0,08	0,19	50	0,02	0,05	0,08	0,15
Total 15	0,06	0,24	0,41	0,68	Total 36-50	0,05	0,13	0,21	0,39

N/A: refers to no available data.

Work Experience. As seen in the Table 8, overseas work experience scores of the first 15 universities are quite higher than the last 15. For this reason, being at the top can be affected by the experiences in different universities or abroad. When the length of service is examined, the first and last 15 universities show similarities. (as seen in the Table 9)

Differences between the first and the last 15 universities of the index were examined with the independent sample t-test (see Table 10). The differences between the first and the last 15 universities of the index were examined in the context of work experience, overseas educational background, male, female, assistant professor, associate professor, professor, and educational background. As the result of performed analyses, there is a significant difference in work experience, overseas education background and overseas work experience (sig 2 tailed – $p=0,000$ and $p<0,05$). When the work experience variable is considered, it

is seen that the academics of the first 15 universities are more experienced than the last 15. Accordingly, it is likely to relate an experienced academic staff with the score received in the index.

Table 8. Work Experience

Work Experience					
Rank	Overseas	Different uni.	Rank	Overseas	Different uni.
1	0,7	1,36	36	0,19	1,2
2	0,79	1,64	37	0,37	1,05
3	0,21	1,21	38	0,13	0,76
4	0,71	1,09	39	0,35	1,19
5	0,67	1,75	40	0,03	0,47
6	0,72	0,9	41	N/A	N/A
7	0,12	0,46	42	0,27	1,25
8	0,14	1,21	43	0	0,75
9	0,16	0,54	44	0,09	0,37
10	0,47	0,68	45	0,03	0,19
11	0,14	0,35	46	0,08	0,04
12	0,15	0,48	47	0,13	1,41
13	0,03	0,66	48	0,14	1,18
14	0,08	0,35	49	0,06	0,28
15	0,08	0,22	50	0,06	0,36
Total-15	0,34	0,86	Total 36-50	0,13	0,75

N/A: refers to no available data.

Table 9. Length of Service

Length of Service			
Rank	Total	Rank	Total
1	24,95	36	15,24
2	21,12	37	18,12
3	17,76	38	14,96
4	16,11	39	16,01
5	20,94	40	16,51
6	N/A	41	N/A
7	18,3	42	16,61
8	16,13	43	23,88
9	23,06	44	23,25
10	16,86	45	19,68
11	23,87	46	29,31
12	34,16	47	22,92
13	20,41	48	22,55
14	28,28	49	38,09

15	27,43	50	28,49
Total-15	22,09	Total 36-50	21,83

As the result of analyses between the groups related to the overseas educational background variable it is seen that in the first 15 universities, the percentage of academicians who studied abroad is higher than the last 15. Another significant difference is the overseas work experience. It is seen that overseas work experience is higher in the first 15 universities.

Table 10. Results of Independent Sample T-Test

Results of Independent Sample T-Test							
	Levene's Test for Equality of Variances		t-test for Equality of Means			First 15-Last 15 Average Values	
	F	Sig.	t	df	Sig. (2-tailed)	First 15	Last 15
	Work Experience	,644	,429	-4,228	28	,000	17,10930
Overseas Educational Background	,006	,940	3,251	28	,003	,73730	,32470
Overseas Work Experience	18,664	,000	3,109	18,084	,006	,36020	,11730
Female	,003	,958	,579	28	,567	,39000	,37070
Male	,003	,958	-,579	28	,567	,61000	,62930
Assist. Prof.	,012	,915	1,078	28	,290	,45270	,39670
Assoc. Prof.	1,828	,187	,766	28	,450	,21870	,20000
Prof.	,425	,520	-,164	28	,871	,32930	,33600
Educational Background	,488	,491	-,642	28	,526	4,60310	4,97730

(sig 2 tailed – p=0,000 and p<0,05)

The relations between educational background, overseas experience, work experience, gender and academic title and index score and dimension of this index ('Culture of Entrepreneurship and Innovation', 'Competence of Scientific and Technologic Research', 'Intellectual Property', 'Collaboration and Interaction', 'Economic Contribution and Commercialization') were examined with the correlation analyses (see Table 11). Entrepreneurship score (or the index score) and the sub-dimensions of this score were examined as dependent variables. As independent variables, educational background, overseas experience, work experience, gender and academic title were taken into consideration. As the result of these analyses, there are significant correlations between the scores of overseas education background, overseas work experience and assistant professor title. There is a significant average correlation between overseas educational background and entrepreneurship score and its sub-dimensions. In other words, there is a positive correlation between the index score and the number of academics who studied abroad in a university. There is a strong significant

correlation between overseas work background and entrepreneurship score and its sub-dimensions. This means that there is a positive correlation between the index scores and overseas work experiences of the academics.

Table 11. Results of the Correlation Analysis

Correlation Analysis		1 ES	2 CSTR	3 IP	4 CI	5 CEI	6 ECC
Educational Background	Pearson Correlation	,009	,173	-,034	,185	-,360	-,078
	Sig. (2-tailed)	,965	,369	,859	,337	,055	,688
Overseas Educational Background	Pearson Correlation	,577**	,482**	,535**	,567**	,312	,456*
	Sig. (2-tailed)	,001	,008	,003	,001	,100	,013
Work Experience	Pearson Correlation	-,175	-,116	-,300	-,183	-,012	-,117
	Sig. (2-tailed)	,363	,550	,114	,342	,950	,545
Overseas Work Experience	Pearson Correlation	,601**	,625**	,541**	,578**	,204	,468*
	Sig. (2-tailed)	,001	,000	,002	,001	,287	,010
Female	Pearson Correlation	-,036	-,129	-,042	,000	-,040	,031
	Sig. (2-tailed)	,852	,504	,828	,999	,837	,872
Male	Pearson Correlation	,036	,129	,042	,000	,040	-,031
	Sig. (2-tailed)	,852	,504	,828	,999	,837	,872
Assist. Prof.	Pearson Correlation	-,523**	-,493**	-,324	-,401*	-,470*	-,477**
	Sig. (2-tailed)	,004	,007	,086	,031	,010	,009
Assoc. Prof.	Pearson Correlation	,043	,156	-,054	,078	-,135	,048
	Sig. (2-tailed)	,823	,420	,781	,688	,485	,804
Prof.	Pearson Correlation	,062	-,006	-,021	-,021	,235	,111
	Sig. (2-tailed)	,750	,975	,915	,913	,220	,565

(sig 2 tailed – p=0,000 and p<0,05).

1. Entrepreneurship Score 2. Competence of Scientific and Technologic Research 3. Intellectual Property
4. Collaboration and Interaction 5. Culture of Entrepreneurship and Innovation 6. Economic Contribution and Commercialization

Another interesting result of the analyses is that there is a negative correlation between the percentage of assistant professors and the index score. In the universities that are in the scope of the study, when the percentage of assistant professors increases, the index score decreases. This result is parallel to the results of t-test analyses. The academics of the first 15 universities are more experienced than the last 15.

There are no significant correlations between the other variables (educational background, work experience, male, female, associate professor, professor) and sub-dimensions of the index.

5. LIMITATIONS, RECOMMENDATIONS AND DIRECTIONS FOR FUTURE SEARCH

Diversity and diversity management have importance in modern day organizations. As well as people are the main components of the production, consumption and innovation, organizations should increase the diversity and manage this process in order to gain competitive advantage and not to be eliminated in the ecology. As the diversity in an organization is higher, so the innovative competencies of the staff in an organization increase. In this study that is conducted in the context of universities, it is seen that innovation tendency increases when the academic titles increase. Other than that, studying or working abroad affect innovation. As the result of the analyses, there is a positive correlation between the universities, which have higher diversity in overseas education and experience, and their rankings and scores of the Entrepreneur and Innovative Universities Index of 2015. In consequence of the study, it is seen that academics of the first 15 universities are superior, have more overseas education, overseas and different university experience than others. Overseas backgrounds of the academics are directly effective on universities' index scores. This result shows parallelism with the correlation analyses and is it likely to say that there's a positive significant correlation between the overseas experience and index score. Sending the staff abroad to make them have experience and provide them overseas education are suggestible to the universities.

There are some limitations to this research. First, our research is based on secondary data. This causes the measurement of the diversity concept with limited dimensions. Because of the nature of diversity while some aspects of diversity have become relatively more 'visible' and 'acceptable' in the modern world, some other aspects of diversity have still remained invisible at work as well as in academia. For future research these invisible dimensions need to be deeply investigated by qualitative methods. Future research may also investigate the other diversity issues like sexual orientation, beliefs, personality etc. by holding surveys and interviews and gathering primary data. Furthermore, the number of universities involved in this research is limited. Therefore, future research may focus on gathering data for different years from other universities to broaden our understanding of the relationship between innovation-entrepreneurship and diversity issues in universities. The other limitation is the data gathered from academic titles starting from assistant professor are included in this study by the reason of the sample of the index. In addition to this, it is an important constraint that there are no specific scores for each faculty, so only the general score of a university is taken into consideration. For further research, it is suggestible that the study might be broadened by including every university in the index and examining the cultural diversity. Although this study has some limitations, the results can give some conclusions for the diversity dimensions of gender,

educational backgrounds, overseas experiences, work experiences and areas of expertise of academics by containing 30 universities' data in the list. It also has importance in terms of revealing the academic profiles of the universities.

Entrepreneurship in Turkey's universities has gained acceleration with the starting of the evaluation of the universities according to the "Entrepreneurial and Innovative Universities Index" by the Ministry of Science, Industry and Technology under the leadership of TUBITAK (Scientific and Technological Research Council of Turkey) since 2012. As being the main actors of the innovation ecosystem, universities should act for strengthening their roles in commercialization and knowledge transfer. The mission of this index is to encourage entrepreneurial and innovative activities in universities and promoting social and economic development by academic entrepreneurship in the higher education system. The index exposes of all dimensions of academic entrepreneurship in the institutional and rooted attitudes that are very important with the aim of facilitating and promoting activities of academic entrepreneurship in the universities. This index also can contribute the increase of the competition on entrepreneurship and innovativeness between universities, defining the measurement of entrepreneurship and innovation performance of universities and the development of innovation and entrepreneurship in the whole ecosystem. There are some of challenges still for Turkish University System that related to the policy-making level issues, structure of higher education system and its planning, bureaucratic issues, level of resources and inputs, level of processes, performance and outputs, cultural and legal barriers.

Creating an individual level synergy is required in order to perform organizational level innovative actions. The easiest way to provide this is to in hold diversity. One of the most important implications for universities in order to be more entrepreneur and innovative is to increase diversity in an organization. Universities should be innovative and embrace change in order to keep up with the change and respond to the competition. Academic scientists can influence the capacity to identify and exploit entrepreneurial opportunities of universities. In this regard, it is anticipated that universities holding diverse academics would perform innovation better. Diversity in academics can be created with the education, professional and academic work experience, or demographics. For future strategic plans and staffing it is suggestible to create diversity by having academicians who have worked or studied in another university. This would help universities to have different points of view and ideas to come out. As there are more different points of view, so the academic activities can be performed in a wide range.

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