ISSN: 2645-5498, SSYJ
2023, 14 (48), 105-118

Ranking's Rate of Coherence for Employed Postgraduates' Students to Post-academic Norms based on Field of Study's Paradigms by TOPSIS's Method

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Received 9 August 2023, Accepted 17 October 2023

Abstract

The purpose of this study is to investigate the ranking of coherence's rate for the employed postgraduate's students in the fourfold field of study's paradigms than to the economic norms based on the knowledge and or the post-academic norms. The TOPSIS's method has been used. Based on capabilities of fourfold decision-making methods for achieving to above aim. The scope of study is the public universities in Isfahan Province. Based on the results of first stage, the plan of leveling and ranking of Iranian Public Universities were chosen by the Ministry of Sciences, Researches and Technology at Kashan University, Honare Isfahan University and Isfahan University in three levels of Jameh (comprehensive) and the specialized universities for investigating the subject of research and was achieved. Based on the sample's size by using Sample Power Software, 320 students were studied in the form of the suitable Quotas sampling by the questionnaire's technique.

Based on the results of research, the rate's ranking of the student's coherence the post-academic norms are in the fourfold field of study's paradigms are hard- pure, applied- hard, soft-pure and soft- applied paradigms orderly.

Keywords: Post-academic, Norms, Knowledge's Economy, Field of Study's Paradigms and TOPSIS.

1. Introduction

The new phenomena emerge in the post-modern period of time and continuously cause some developments in the different backgrounds such as: the sphere of science and enter the science in the new stage under title of post-academic. The post-academic science is the science that is produced more from its own main place as university. This science is regarding to the political,

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commercial and the military institutions of productions and has some attitudes to the applied knowledge. On the other hand, the sciences of knowledge are produced for the usage and for the research and meta-discipline method in the various institution purely the research institution of university such as: industry, research and development. Based on the demanded scientific results of production and active in the different research centers out of universities. The members of the scientific boards have the research contracts with the different social institutions in the frame of the related plans like: industry(Ghaneirad, Maleki, & Mohammadi, 2013, p. 42).

Based on the scientific environment such as: the higher education has become the subject of the deep conceptual and the structural developments for the long time globally. The third wave of the science that has been begun from the end of the century 20 has accompanied with the structure of the knowledge's and meta-discipline networks. The big computerized and jump and the computerized revolution led to cause some developments the science with an increasing speed and shorts time multiple. The inter-intellectual communication and tolerances in science has spread in the global measurement and reproduction and the scientific exchange has become the global process.

The common affirming on the new theoretical approaches of the sciences production such as : spiritual ownership scientists , attention to the needs of the definite sections and or grand in the society in the community influence of the political and economic values and ethics in the body of scientific research, orientation of the research activities towards income-making and an achievement of the wealth and not purely an extension of knowledge, mechanization of the scientific findings, the scientists attention to desires of employee focusing on spheres the specific problems because of the lack of an attention to favors and to of employee focusing on spheres the specific and finally the change of the criterions of the quality assessment and other cases affirms the emergence of relative new traditions ethics and norms for the scientific activities(Rabain, Rabani, Hemati, Ghazi Tabatabaee, & Vadadhear, 2011, p. 18). According to the above topics, this study investigated the degree of adherence of working students in the four discipline paradigms to the norms

of knowledge-based economy or other post-university science norms using the TOPSIS method.

2. Review of Literature

The collection of these developments in the form of some titles such as: the network's structure of knowledge, the field of study, the scientific communication's development, the scientific problem-orientation, background-orientation, social responsibility, local-global knowledge, knowledge's merchandise, the exchange's value of knowledge, the economy an function's emergence of semi- corporation and agent network of university, an industry of higher education rules of marketing supply and demand at university, the necessities of university tolerance with society, state and world of labor, an importance of technology and an innovation, inclusive high education و the globalization and the internationalization of higher education, higher education progress and the higher education reflect some the most important aspects of the science global development that is discussed under the title of economy based on the knowledge and post-academic science.

while the knowledge wasn't as the main source and of the economic growth an increase of the life standards in the century of 20, the society begun to realize the importance of knowledge form that time. The knowledge changed the important part of the economic and theories(Veselá & Klimová, 2014, p. 414). Information and knowledge are considered as the main and source of wealth and knowledge is used as an alternative of the traditional sources such as capital and energy in the past(Drucker, 2012). The development of economy has the relation to the Conway based on knowledge with an emergence of post-industrial society Druker (2012) in his book entitled post-capitalism society define two main classes from the clerks of knowledge.

1. Management of knowledge: someone who use and manage this knowledge.
2. The clerks of services that work based on the advanced knowledge.

In the economy of knowledge, the knowledge with incomplete characters of knowledge with consumption, the simultaneous use by the different individuals and the simultaneous use in the different places are main factors of production(Cavusoglu, 2016, p. 721). In fact, the economy of the knowledge is

different from the usual items and service. The creation, distribution and application are the base of the knowledge's economy(Hogan, 2011). On the other hand, the economy based on knowledge is defined as an economy that is able to produce, publish and use the knowledge. The knowledge is the key factor in the growth, creating wealth and occupation. The humanistic capital relied on the technology of information and communication is considered as leader of creativity, innovation and the production of the new ideas in that(Cavusoglu, 2016, p. 721).

Szabo, M Soltes and Herman(2013) specify an importance of knowledge and the intellectual capital in trade organization and the markets by an increase of exploitation in the process of production. In this line, the economic activities based on the knowledge let the countries to cause the value by an increase of exploitation from the production factors (Çavusoglu, 2014). In addition to this, an economy is the subject that has discussed in the different social and institutional sectors widely(Tarango & Machin-Mastromatteo, 2017, p. 1).

In Druker's point of view (2012), the schools and universities are as the institutions of the social responsibility that should act in the frame of the economic institution's partners. Tarango and Mastromatteo (2017) affirms the need of the economic institutions to the educated people that educate themselves by left time education to their education. Therefore, an investment in education research development and the technology of an information has the important role in this act(Veselá & Klimová, 2014, p. 2). On the other hand, the important of creation, distribution and application from knowledge challenge many traditional methods for understanding and realizing the process of the economic development and address the new questions about not only mechanism of these processes but the role of companies and universities as a coordinator of the traditional management methods and the public policies(Conceição, Gibson, Heitor, & Shariq, 1998, 2).

The importance of the knowledge economy has analyzed in the different fields of study and from the different views. For example, Dosi (1998) discussed regarding to the theories of the economic growth by the way by addressing the conceptual difference among the new and the traditional methods and analyze the economic growth. The main focus of Dosi's

discussion is regarding to the way that the knowledge helps to the economic growth. Generally, Dosi conclude that the relation and the dependency among skills and ideas in the process of learning leads to the accumulation of the knowledge and is a basis for analyzing the role of university about the sustainable economic growth. The importance of universities has been referred for the economic development, well historically. For example, in the cases of study of (Freeman, 2013); (Mowery & Rosenberg, 1991). and (Conceiçao & Heitor, 1999). As is expected, in these studies, to has the main missions of the higher education and doing of the presented researches in any way recently the universities pledge themselves.

Cantina Heritor Santos (1999) in these is expected, the main mission of the universities is education and researches. In any way, recently; the universities pledge themselves to do some sub active under title of relation with society. The description that had been presented from the recent development in companies and universities of the present time show that an integration among these two institutions have been caused. This is; because, the creation of the added value and wealth relates with the production of knowledge increasingly. Thus, it is natural that the companies and industries pay attention to the universities by inspiring from how to do the creative duties. The universities pays attention to the companies for doing the basic duties of teaching and research and also management learning of the commercial advantage achieved from their intellectual estates (Conceiçao & Heitor, 1999, p. 2).

Overall the economy of knowledge has the special importance for collecting the knowledge based on the processes of the format and in formal learning. This accumulation forms in the frame of ideas and skills that have the different economical vantages. Their interdependences in one complicated process of tolerance needs to the rewriting of university traditional role and also the contemporary institutions generally. The studies show that in one university that keeping of university institutional integration in the sustainable flexible conditions is necessary this type of education and need to manage the different demands and the confidence from the participatory learning point to the variety of system. In this variety of system, the recognition and the realizing of the different elements of university research function is important. The fourfold

fields of study paradigms than to the norms of an economy based on knowledge and or on other interpretation is considered on the norms of post-academic science.

3. Methodology

This case of study is survey. For collecting the research data, the questionnaire's technique is used. The TOPSIS's method has been used for determine the coherence's rate of the employed students in the fourfold fields of study in the fields of study's paradigms. The stages of doing this research and the related formulas have presented in the finding section scope of study.

The scope of study of the present research is the public universities of Isfahan listing; University of Isfahan, University of Art of Isfahan and University of Kashan located in Isfahan Province. Based on the results of first stage of leveling and ranking of Iranian public universities by the Ministry of Sciences, Research and Technology(2016) including the leveling of the universities and the institutions of public higher education and achieved from analyzing the creditable data's around the defined indexes and criterions near to 70 universities and the institutions of public higher education; Isfahan University from level was chosen for the survey of the research's subject; Kashan University from level 2 was chosen for the survey of the research's subject Jameh(comprehensive) universities and the Art of Isfahan University was chosen for the survey of the research's subject.

The present research attempts to be the basis of the students' choice based on Biglan's, Becher's and Trowlers' classification (Becher, 1994; Biglan, 1973, p. 202; Trowler, 2001) from the educational departments and academic fields. This classification was chosen; because, in an image of Becher (1994) the scientific fields of study is called with the metaphor of the academic tribe. This scientific fields of study are as the tribes, are inside of the residential university, the territorial borders; inside of these territorial spheres.

There are the different fields of study with the epistemological and social differences. They have different the term of norms, values, tolerance methods, life's style, the ethical codes and educational codes. The students are as natives of these tribes and building of identity, technical and cultural attitude and

skills of these natives for success in different fields of study in the process of socialization. that is of the ethical order of study, values, norms, the recognition of the tribes' enemies and the recognition of the role's symbols and so on(Amin Mozafari & Yousefi Aghdam, 2011, p. 50). In the frame of fields of study's culture, the fields of study have been classified based on the different criterions. These classification are based on the degree of the lack of confidence, dependency or the rate of the members' autonomy for preserving or producing overbearingness (Whitley, 1984)or based on the style of the intellectual or abruptive, adhesive and reflective research(Kolb, 1981) and the level of the paramedic development(Lodahl & Gordon, 1972).

The most famous field of study classification belongs to Biglam (1973) and Belcher (1994). Becher classifies the university fields of study based on Biglan and Kolb's classification into four classes including; pure- hard, applied- hard, pure- soft and applied- soft. In his view, the knowledge of fields reflects the real-world differences in the subject(Becher, 1994; Trowler, 2001, p. 35). This knowledge differs based on the research subjects, identity of the knowledge's growth, relation between researcher and knowledge, research procedures, limit of the fact's claims, their combined criterions and the results of the research(Becher, 1994; Trowler, 2001, p. 36). The characters and the aspects of the case of the study has come based on Becher's and Trawler's typology in the following table.

Table 1. Classifying the Scientific Fields and the Knowledge Identity in Becher's and Trawler's views (2001).

Grouping of Scientific Fields of Study	Knowledge Identity
Pure Sciences (For Example: Physics): Hard/Pure	Increasing, Minor (Transparent, Tree Like) Global, Quantitative, Simplifier, Non-Personal, Value-Abandoned, Definite Criterions for Research and Determination of Obsolescence, General Questions on Observed Questions in Present and Future, Discoverable or Explanatory Results
Human Sciences (For Example: History, Pure Social Sciences like Anthropology): Soft/Pure	Repetitious, Total-Oriented, (Organic, River Like), Local, Qualitative, Complicated, Personal, Value-Oriented, Polemical about New and Old, Lack of General Agreement on Observed Questions in Present and Future, Results Based on Understanding of Realization
Technology (For Example: Mechanic Engineering or Medicine) Hard/Applied	Goal-Oriented|, How, (By Hard Knowledge), Favor to Priority of Physical Environment, Pragmatism of Discoverable Approaches, Using Both of Quantitative and Qualitative Approaches, Criterions based on Arbitrary and Performance of Aims, Pragmatic, Results in Form of Product or Technique
Applied Social Sciences (For Example: Educational Sciences, Law and Public Management): Soft/Applied	Pragmatic, How (By Soft Knowledge), Favor to Increase Professional and Semi-Professional Acts, Usage of Case of Studies, Agreeable Results and Based on Procedures

Source: (Parayad & Maroufi, 0214, p. 10)

The sampling method was in the form of suitable stratified sampling based on the share of postgraduates' student population. The sample size in the researchable universities estimated on the suitability of the volume of the scope of study as follows. It is necessary to remind that the researcher estimated the numbers of student the volume of sample 320 students by using Sample Power Software. In any way, it attempts to collect the more questionnaires until it is decreased in spite of the omission of the faulty questionnaire from test's power (80%) and if, the numbers increased, the questionnaire will increase to the power of test.

Table 2. Determination of Researchable Sample's Size in Kashan, Isfahan and Art of Isfahan Universities

Students of PhD's Degree				**Students of Master's Degree**				**Total**
University	Male	Female	Total	University	Male	Female	Total	
Isfahan University	33	24	57	Isfahan University	55	77	132	189
Kashan University	12	8	20	Kashan University	37	39	76	96
Isfahan Art University	6	2	8	Isfahan Art University	6	21	27	35

4. Findings

From the collection of the researchable students, 54/6% of them are male; 45/4 of the students are female; 62/4% of them are single; 37/6 of the students be married. Based on the finding of the research, 67.6% of them have Master Degree and 32/4 of them have Ph.D. degree. The period of studying for 83/5 of the students is daily while 16/5 of the student be nightly; 27/3 of the students are employed; and, 72/7 of the students didn't has the job.

In the form of the financial support, 5.1% of the students are supported by the Ministry of Sciences; 2/2 of the students are the fellowship of the public and or the private institutions; 7/4% of the students have being in charge to study; 4% of the students receive fellowship's costs from the Minister of Sciences, Research and Technology; 2/6% of the students the researchable reception and their majority 78/8% are free students. In terms of the cohesion of socialization; 35/3% of the students have two studying levels; 4% of the students have three and have studied in one university; and their majority 60/7% of the students have no the cohesion of socialization.

In this part, the TOPSIS method is introduced to determine the rank of each of the standard paradigms in adherence to post-academic norms. The finding of the research has presented based on this method. This method is used to prioritize between different options based on the distance from the ideal solution(Hwang & Yoon, 2012). The stages to do this are as follows:

First Stage: forming of the decision-making matrix based on average of the coherence rate of students for each field of study paradigms to post-academic norms.

Table 3: Decision's Matrix based on Coherence's Average of Students to Fourfold Fields of Study Paradigms than Post-Academic Norms

DM	Commodity	Commercialization	Competitive	Epidemic	Standardization	Globalization	Extravagant	Responsibility
Hard-Pure	6,2391	27,6957	9,6957	9,3478	6,3913	6,4889	6,5652	6,5435
Hard-Applied	6,5876	26,433	9,5258	9,2421	6,2526	6,4468	6,383	6,4737
Soft-Pure	6,6078	26,8824	9,5098	8,9216	6,2941	6,4902	6,549	6,5098
Soft-Applied	6,5362	26,8986	9,6667	8,5797	6,6232	6,6532	6,4493	6,2754

In above table, the existing number in each cell shows the average $)r_{ij}$ (for each pos- academic norms as an index for the fields of study paradigms as researchable choices.

Stage Two: Formation of an unbalanced Decision Matrix (Vector-Based Matrix Normalization):

$$N_{ij}=\frac{r_{ij}}{\sqrt{\sum_{i=1}^{m} r_{ij}^2}} \qquad i=1, \ldots, m \quad j=1, \ldots, n$$

Table 4:. Matrix of Normal Decision based on Coherence's Average of Students to Fourfold Field of Study's Paradigms than Post-Academic Norms

DM	Commodity	Commercialization	Competitive	Epidemic	Standardization	Globalization	Extravagant	Responsibility
Hard-Pure	6,2391	27,6957	9,6957	9,3478	6,3913	6,4889	6,5652	6,5435
Hard-Applied	6,5876	26,433	9,5258	9,2421	6,2526	6,4468	6,383	6,4737
Soft-Pure	6,6078	26,8824	9,5098	8,9216	6,2941	6,4902	6,549	6,5098
Soft-Applied	6,5362	26,8986	9,6667	8,5797	6,6232	6,6532	6,4493	6,2754

Stage Three: The normal decision matrix is formed. To get the matrix, the following equation is used:

$$V_{m\times n} = N_{m\times n} \cdot W_{m\times n}$$

$W_{m\times n}$ is the matrix of the indexes' weight can achieve by the different method. In this study, the anthropic method has been used. Anthropic shows an amount of the existing lack of confidence from the concepts of dates. This method is one of multiple criterions decision-making techniques(Asgharpour, 2006, p. 283). Because the distribution of opinions and court information is an indicator of the importance of that indicator, this paper has used the technique. The steps and formulas for this method are as follows:

1. Calculation of normalizes decision matrix in the percent form by using the following relation;

$$P_{ij}=\frac{r_{ij}}{\sum_{i=1}^{m} r_{ij}} \qquad i=1, \ldots, m \quad j=1, \ldots, n$$

2. Calculation of Ej that show the confidence from data for each index as follows;

$$E_j=-\frac{\sum_{i=1}^{m} P_{ij} \cdot LnP_{ij}}{Lnm} \qquad j=1, \ldots, n$$

3. Calculation of the lack of confidence for each index by using the following relation;

$$D_j=1-E_j \qquad j=1, \ldots, n$$

4. Calculation of weight of each index by the following explanation

$$P_{ij}=\frac{D_j}{\sum_{j=1}^{n} D_j} \qquad j=1, \ldots, n$$

Table 5. Matrix of Normalized Decision based on Average of Student's Coherence Fields of Study Paradigms than Post- Academic Norms

N.DM	Commodity	Commercialization	Competitive	Epidemic	Standardization	Globalization	Extravagant	Responsibility
EN	0,99973458	0,99985848	0,99996304	0,99944304	0,999749637	0,99980009	0,999933961	0,99986874
W	0,12499258	0,125008068	0,12502114	0,12495613	0,12499446	0,12500077	0,125017505	0,12599
Entropy's Total				7,99835158				

Step Four: Identify the ideal A + positive solution and the A-ideal ideal solution from the following formula:

$$A^{+}=\{(\max {}^{V}{}_{ij} \mid j\in J^{+}),(\min {}^{V}{}_{ij} \mid j\in J^{-}) \mid i=1,2,\ldots,m\}=\{V_1^{+}, V_2^{+}, \ldots, V_n^{+}\}$$
$$A^{-}=\{(\min {}^{V}{}_{ij} \mid j\in J^{+}),(\max {}^{V}{}_{ij} \mid j\in J^{-}) \mid i=1,2,\ldots,m\}=\{V_1^{-}, V_2^{-}, \ldots, V_n^{-}\}$$

V_1^+ V_1^- & represents an ideal positive and negative solution for indicators respectively.

Stage Five: calculation the distances from the positive ideal solution and the negative ideal stages by the following relation:

$d_i^+ = \{\sum_{j=1}^{n}(V_{ij}-V_j^+)^2\}^{0.5}$ $i= 1, \ldots, m$ $d_i^- = \{\sum_{j=1}^{n}(V_{ij}-V_j^-)^2\}^{0.5}$ $i= 1, \ldots, m$

d_i^+ *and* d_i^- show the distance from the negative and the positive ideal solutions form choices of Js

Stage Six: calculation of relative approaching for each from the choices by the following relation:

$$CC_i = \frac{d_i^-}{d_i^+ + d_i^-} \qquad i= 1,2, \ldots, m$$

CCi shows the rate of the relative approaching for choice of J

Stage Seven: Choices' Priority. In this stage, based on the rate of relative approaching for each from choices, the priority of each choice is specified; so that the choice that has the rate of bigger relative approach in higher priority. In The below table, the findings of the research have presented based on the stage four to stage seven.

Table No 6: Ranking of the Fields of Study's Paradigms in Coherence to Post-academic Norms by TOPSIS's Method

Row	W.N.DM	Commodity	Commercialization	Epidemic	Competitive	Standardization	Globalization	Extravagant	Responsibility	d + of Field of Study	DofFielof Study	RankofStudy
1)	Hard-Pure	0.600397	00.415908	00.631346	00,0646927	0,06249123	00,0607432	00,6326177	0,00633965 9	0,00548117	0,007067	0.56320
2)	Hard-Applied	0,633933	0,06123395	00,620283	0,0639612	0,06113509	0,0622684	0,06150610	00,627203 3	0,00556408	0,006188	0,52654
3)	Soft-Pure	0,635877	0.06227502	00,619241	0,0617431	0,06154086	0,0626875	0,06310567	00,030700 9	0,00516222	0,005562	0,1862
4)	Soft-Applied	0,628987	0,06231254	00,0629458	0,0593769	0,06475862	0,0642523	0,06214497	00,060799 11	0,00633809	0,006019	0,48710
5)	d+ of Field of Study	0,0635877	0,06415908	00,0631346	0,0646927	0,06475865	0,0642523	0,06326177				
6)	d+ of Field of Study	0,0600397	0,06123395	00,019241	0,0593769	0,06113509	0,0607432	0,06150610				

Based on the findings of the above table, the degree of students' coherences rate to pos-academic norms in the fourfold fields of study paradigms are hard-pure, hard-applied, soft- pure and soft- applied-soft paradigms orderly.

Table 7. Ranking of Coherence to Post-Academic Norms among Field of study's Paradigms by SAWS' method

Ranking of Norms	Commodity	Commercialization	Competitive	Epidemic	Standardization	Globalization	Extravagant	Responsibility
Hard-Pure	8	2	5	1	1	7	4	3
Hard-Applied	2	7	5	1	8	4	6	3
Soft-Pure	1	5	6	7	8	4	2	3
Soft-Applied	4	5	3	8	1	2	6	7

Also, the degree of the coherence's rate for each post-academic norm among the fields of study paradigms have achieved in the above tables.

5. Conclusion

Principally, the main aim of socialization at universities is achieving of role forming denting and the commitment among the students and be the individual consciousness for in the role and specialty. In this research, the degree of adherence of graduate students working in four disciplinary paradigms to knowledge-based norms or, in other words, post-academic norms according to TOPSIS method was investigated. The research findings showed that although it was expected that, considering the nature of the paradigms of the studied disciplines, students working in hard and soft courses would have a higher degree of commitment than post-academic norms; students working in a hard-pure paradigm, such as a degree in physics, rank first.

Students working in soft-applied sciences such as Applied Social Sciences, Law, and Management are in the final rank. The results can be explained by considering the nature of scientific disciplines that the hard-applied and soft-applied disciplines, due to the low and insignificant relationship with the industrial sector and economic production, do not differ much from hard-pure and soft-pure disciplines and both types of field of study paradigm adhere to theoretical tendencies.

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