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IZMIR EAST TECHNICAL UNIVERSITY

**Technology and Economic Development
2nd International Conference on**

The Dynamics of Science and Technology Policies

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Izmir University of Economics**

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**2nd International Conference
on the Dynamics of Science and Technology Policies**

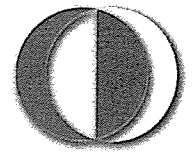
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**SECOND INTERNATIONAL CONFERENCE ON THE
DYNAMICS OF SCIENCE AND TECHNOLOGY POLICIES**

**IZMIR UNIVERSITY OF ECONOMICS
MIDDLE EAST TECHNICAL UNIVERSITY**

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**The Perspectives of Youth Concerning Knowledge Economy: A first Step in
Turkish Experience**

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Abstract

This study investigated the perspectives of youth concerning knowledge economy (KE). Data were collected through a fifty-item questionnaire and administered to 94 students from Department of Management, Department of Economics, and Department of Tourism Management of Baskent University, Faculty of Economic and Administrative Sciences. The results of the questionnaire will be carefully scrutinized by statistical methods. Students' opinions are clustered in five major themes concerning the knowledge economy. They believe that firms and their position in knowledge economy, the relationship between knowledge and knowledge economy, the effect of globalization, EU and Turkey relationship, and ICT and knowledge economy association are all the fundamental standpoints of knowledge economy and major distinct concepts and phenomena concerning knowledge economy. Although females and males differ in some items regarding economic activities, the effect of globalization and ICT in knowledge economy, and the departmental difference are seen only in Economics about the items. In general, students from fourth grades differ from the third grades in that their mean scores are higher for most of the items that statistically significant. Recommendations were provided for further studies to lead to more application concerning knowledge economy.

Keywords: Knowledge Economy, Information and Communication Technologies, Globalization, European Union, Business World.

1. LITERATURE REVIEW

From 70s to present, we have witnessed the acceleration of knowledge creation and dissemination. Needless to say, lowering the cost of computer technologies and networking with the increase of their power have yielded such an effect on knowledge production. ICTs allowed people from research and development sector to work collaboratively in

distances in case of amplifying the overall productivity and effectiveness (Chen & Dahlman, 2005). This is the simple story of what we call as knowledge economy.

The term "knowledge economy (KE)" sounds in disciplines and a variety of its applications are utilized in some disciplines such as economics, education, management and so forth. In order to depict knowledge economy, Hepworth (2006) associates knowledge economy to human and social capital where the former is about what you know and the latter is who you know. Hepworth explains human capital as the individual's knowledge, experiences, capabilities, skills, creativity and innovativeness whereas the social capital as the ability of people to work together for common purposes in groups and organizations. Chen and Dahlman (2005) define knowledge economy as "an economy where knowledge is the main engine of economic growth" (p. 1). Knowledge economy is related to the knowledge processes like acquisition, creation, dissemination and utilization within the framework of economic development.

For Lopes, Martins and Nunes (2005), knowledge economy is strongly related to four terms; innovation, science, culture and citizenship in which they altogether associate with ICTs. Very similar to this establishment, according to Chen and Dahlman (2005), there are four essential parameters of knowledge economy; (a) "economic incentive and institutional regime" (b) "educated and skilled workers", (c) "effective innovation system" and (d) "modern and adequate information infrastructure" (p.4).

The knowledge economy is the natural outcome of technological progress that has improved the ways we can obtain and disseminate information. Additionally, Hepworth (2006) argues that ICT revolution created 'new economy' development scenarios. Turkey's economy has in the last two decades become more competitive and more open to global markets. Besides, Turkey is a country in the stage of full EU membership. Therefore, depicting the current situation of knowledge economy in Turkey is indispensably a vital action to study.

According to "Turkey knowledge economy assessment study" (March 2004), some countries are pioneers in knowledge economy framework, yet, such countries have not been modeling to transform other countries as knowledge-economies. Similarly, along with Turkey, most countries do not know the features or examples of knowledge economy to utilize them for transformation. Similar to "Turkey knowledge economy assessment study" (March 2004), Chen and Dahlman (2005) noted that ICT in knowledge economy is about

the accessibility, reliability and efficiency of PCs, wireless communication like phones, TVs and Radios, and the networks.

Hargreaves and Shaw (2006) argued that countries want to be called as knowledge economies which are not quite similar to the meaning of information economy or information society. They depicted knowledge economy as referring to how knowledge is formed, utilized, conveyed and adapted at a high speed in knowledge-based communities. Here, we see another feature of knowledge economy, according to Hargreaves and Shaw (2006); knowledge economy is a learning society where learning is shared, continuously and permanently. As the workers continue learning in the context, the success of economical activities and the formation of innovation culture will amplify. Additionally, "Turkey knowledge economy assessment study" (March 2004) also emphasizes that both globalization and knowledge economy yield a new trend in education called as lifelong learning for individuals.

Uckan and Beceni (2003) uttered that being a knowledge economy country requires a careful analysis of the country's political, economical and cultural structures. They move one step further and propose that "the transformation of Turkey into information society and the settlement of a knowledge based economy will be only possible with the implementation of an e-governance model ..." (p.4). Riley (2003) recommends some policies for governments so as to achieve knowledge economy. For instance, education should be the central process of daily life to cultivate knowledge workers, or governments must PAY attention to the investment on infrastructure. As "Annual innovation policy for Turkey" report (2004) pointed, in order to changeover to knowledge economy, facilitating the scientific and technological developments are indispensable. To reach this aim, sustaining research and development activities (also noted in Turkey knowledge economy assessment study, March 2004), establishing technoparks, and regulating physical, human and governmental infrastructure are the major courses of action.

To Aktaş (2005), both knowledge economy and knowledge society arise from four systemic basics; (a) creation of new knowledge as a result of research actions, (b) conveying of knowledge among people in the form of education in general; (c) diffusion of knowledge with the assistance of ICTs, and (d) utilization of knowledge for industrial development.

As Lisbon strategy of EU aimed, Europe has foresighted to have the number one knowledge economy all over the world, and declared that the necessity is "not only a radical transformation of the European economy, but also a challenging programme for the modernisation of social welfare and education systems" (p. 3). With this longitudinal aim, EU wants to be the leading body in relation to the quality of its education and training systems. Within this framework, OECD argued that United States is one of the well-established countries in the knowledge economy. Since the Turkey has close relationships both with EU and US, the exercises they elaborated provide examples for our country (Education at a Glance 2005).

ICT has potential to alter current economical and social activities. In order take advantage of ICTs in terms of knowledge-based economies, governments adopt their strategies and policies. Moreover, ICT provides a foundational base for "business growth and dynamism" (p. 3) in terms of innovation and entrepreneurship. Similarly, the knowledge, skills and abilities an employee has is an essential point for both developmental and growth activities (Vickery, 2003). Riley (2003) emphasized the role of ICT in knowledge economy and stated that knowledge economy is an illumination of human-thought alteration due to innovative technologies.

From 90s, technological innovations have both evolved and affected the economical dynamics of modern world. In that sense, possessing the knowledge has turned out to be the major concern of any company (Lopes, Martins & Nunes, 2005). As a reflection of knowledge economy, the price of ICTs has diminished whereas their performance has immensely increased due to the several network structures. According to OECD (2004), Small and medium-sized enterprises (SMEs) play a vital role for the Turkish economy due to the number and the large share of the workforce involved. In that sense, many governmental bodies have maintained the development of those SMEs for years. The same report notified that SMEs' average profile is different from that of SMEs in the European Union or in most other OECD countries in that their average workforce and turnover are much smaller. Through the European Union membership process, Turkey has evolved its economic policies and strategies which profoundly influenced the structure and place of SMEs.

Both for EU and candidate countries, universities play a vital role in terms of transforming societies to knowledge societies and economical efforts to knowledge

economies. Through education in universities, it is aimed to turn current efforts concerning knowledge economy into reality (Aktaş, 2005).

Since the universities are very significant for cultivating knowledge economies, our research aims to gather the ideas of young Turkish people who attend higher education in economy related departments.

2. METHOD

2.1 Participants

This study included 94 students (43 female and 51 male) from Department of Management (N=32), Department of Economics (N=50), and Department of Tourism Management (N=12) of Başkent University, Faculty of Economic and Administrative Sciences. The age ranges from 19 to 25 where the average is 21. There are 53 third grade and 41 fourth grade students in the study. The demographics of the participants are represented in Table 1.

Table 1. Demographics of participants

Department	Gender		Grades		Age Groups						
	Female	Male	3rd Grade	4th Grade	19	20	21	22	23	24	25
Management	18	14	26	6	2	10	10	5	4	1	0
Economics	20	30	17	33	2	4	6	14	13	8	3
Tourism Management	5	7	10	2	0	2	4	1	3	1	1
Total	43	51	53	41	4	16	20	20	20	10	4

2.2 Design of the Study and Instrumentation

A questionnaire was developed to understand the perspectives of university youth concerning knowledge economy including A fifty-item questionnaire on a 5-Likert scale (from strongly agree to strongly disagree) and demographic questions from literature.

Items were translated into Turkish and a reliability analysis was conducted. According to the Cronbach's Alpha value with .91, items formed a scale that had high internal consistency reliability. Since the study aimed to understand the perspectives concerning

knowledge economy, none-experimental research design was employed. The survey included three independent variables (gender, grades, and departments) and one dependent variable (item scores).

2.3 Findings and Discussions

Table 2 demonstrates the item description, the number of respondents, item mean and standard deviation. Items were listed from the highest mean score to the least mean score. Following the table, explanations were provided in a bulleted form.

Table 2. Item descriptions

Item No	Item	N	M	SD
24	Bilginin oluşturulması ve kullanılması kadar yayılması da önemlidir.	93	4,43	0,76
26	Firmalar yeni teknolojilere adapte olabilen organizasyonlar olmalıdır.	93	4,35	0,80
1	Bilgi, ekonomide önemli bir rol oynar.	94	4,30	0,84
3	Ekonomik işleyişte küreselleşmenin etkisi artmaktadır.	94	4,29	0,70
42	Günümüzde, bilgisayar bilgisi zorunlu hale gelmiştir.	93	4,28	0,93
17	Öğrenme, organizasyonlar için vazgeçilmez bir kavramdır.	94	4,27	0,91
2	Ekonomi ile ilgili etkinlik ya da faaliyetlerde bilginin gücü önemlidir.	94	4,24	0,77
25	Firmalar "öğrenen" organizasyonlar olmalıdır.	93	4,20	0,82
28	Günümüzde firmalar üniversitelerle iletişim halinde olmalıdır.	93	4,19	0,90
27	Günümüzde firmalar diğer firmalarla iletişim halinde olmalıdır.	93	4,17	0,90
20	Bilgi ekonomisinde, değişimlere açık olma önemli bir olgudur.	93	4,17	0,85
8	İçinde bulunduğumuz yüzyıl "yeniliklerin (innovation)-yönlendirdiği-üretim" yüzyılıdır.	94	4,17	0,92
9	Son yıllarda, iş dünyası bilişim ve iletişim teknolojilerinin uygulamalarında bir patlama görülmektedir.	94	4,17	0,74
21	Günümüzde bilgiye erişim kolaydır.	93	4,16	1,05
43	Yeni teknolojilerin gelişmesi yeni iş olanakları üretmiştir.	93	4,14	0,90
45	Elektronik ticaret, tüketim toplumunu tetiklemektedir.	93	4,12	0,85
7	Küreselleşme olgusu bilişim teknolojilerinin iletişimi daha kolay hale getirmesi ile güçlenmektedir	94	4,11	0,77
13	Rekabet kavramı piyasalarda başarı için gittikçe küresel bir anlam kazanmaktadır.	94	4,10	0,87
34	Günümüzde zenginler daha zenginleşmekte, fakirler daha da fakirleşmektedir.	93	4,06	1,04
16	Bilgi ekonomisi için bilginin yayılma gücü önemlidir.	94	4,05	0,71
29	Günümüzde firmalar devletle iletişim halinde olmalıdır.	93	4,04	0,87

Item No	Item	N	M	SD
30	Dünyadaki rekabeti tetikleyen bilişim teknolojilerindeki gelişimdir.	93	4,02	0,81
4	Bilginin gücü artan teknolojik değişimin bir sonucudur.	94	3,99	0,80
19	Bilgi ekonomisinde, problem çözme becerisi önemli bir beceridir.	93	3,99	0,81
6	Küreselleşme olgusu ulusal ve uluslararası kısıtlayıcı şartların kaldırılması ile güçlenmektedir.	94	3,98	0,79
15	Bilgi birikimin artış hızı, ekonomik büyüme adına önemlidir.	94	3,97	0,86
44	Elektronik ticaret kavramı küreselleşmeye neden olan bir olgudur.	93	3,97	0,93
36	Günümüzde geliştirilecek olan politikalar girişimci ortamlar oluşturmaya odaklanmalıdır.	93	3,96	0,86
5	Bilginin gücü bilişim teknolojilerinde meydana gelen gelişme bir sonucudur.	93	3,96	0,82
23	Bilişim ve iletişim teknolojilerine yapılan yatırım, insan kaynaklarına yapılan yatırımlarının tamamlayıcısıdır.	91	3,91	0,94
32	Günümüzde, ekonomik etkinlik ve faaliyetlerin yapısı değişmektedir.	92	3,89	0,91
31	Dünyadaki rekabeti tetikleyen küreselleşmedir.	93	3,88	0,87
39	Bilgiye dayalı endüstrinin gelişmesi bilgiye bağımlı küresel bir toplum oluşturmuştur.	93	3,85	0,74
18	Bilgi ekonomisinde, yaratıcılık önemli bir beceridir.	93	3,83	0,95
41	İnternet KOBİ'lere rekabet edebilme olanağı sağlamıştır.	93	3,75	0,87
11	Bilişim ve iletişim teknolojilerinin hızlı gelişiminin nedeni kişisel ihtiyaçların artışıdır.	94	3,73	1,02
22	Günümüzde bilgiye erişim ucuzdur.	93	3,73	1,17
12	Bilişim teknolojilerindeki gelişmesinin nedeni büyük orandaki verinin düşük maliyetlerde saklanması ve iletilmesidir.	94	3,66	0,86
40	Günümüzde mal alışverişi yerine bilgi ve fikirlerin oluşturulması ve değişimine önem veren bir iş dünyası oluşmuştur.	93	3,60	0,82
47	Türkiye'nin Avrupa Birliğine üyeliği Avrupa Birliği ekonomisine fayda sağlayacaktır.	93	3,58	1,16
33	Ekonomik anlamda dünya ulusları yakınlaşma yerine kutuplaşmaktadır.	93	3,57	1,08
48	Türkiye'nin Avrupa Birliğine üyeliği bilim ve teknolojiye dayanan ekonominin oluşmasını sağlayacaktır.	93	3,56	1,15
49	Türkiye'nin ekonomi adına Avrupa Birliği ülkelerinden öğrenecekleri vardır.	93	3,54	1,29
46	Türkiye'nin Avrupa Birliğine üyeliği Türkiye ekonomisine fayda sağlayacaktır.	93	3,54	1,21
35	Günümüzde geliştirilecek olan politikalar insan gücündeki gelişmelere odaklanmalıdır.	93	3,54	1,06
38	Avrupa Birliği ile ortaya çıkan serbest dolaşım izni iş dünyasına olumlu yansıdı.	93	3,52	1,04
14	Bilişim teknolojilerinin geniş kitlelere bilginin yayılmasını sağlaması, tekrar-icat etme ya da tekrar-keşfetme olgusunu ortadan kaldırmıştır.	94	3,35	1,02

Item No	Item	N	M	SD
37	Küreselleşme, bilim ve teknoloji politikalarının oluşturulmasında yeni zorluklar ortaya koyar.	93	3,34	1,03
50	Avrupa Birliği'nin ekonomi adına Türkiye'den öğrenecekleri vardır.	93	3,08	1,31
10	Bilişim ve iletişim teknolojilerinin hızlı gelişiminin nedeni fiyatlarda gözlenen ucuzlamadır.	94	2,98	1,07

The first theme is about the firms and their position in knowledge economy. According to participants, firms must become learning organizations ($M=4.20$), and set up new technologies ($M=4.35$). Similarly, they support the idea that learning is an indispensable phenomenon for organizations ($M=27$). In parallel, students believe that ICT applications have become popular in business sector ($M=4.17$). Collaboration is the last part of this issue and participants notified the importance of firms and the others' cooperation. By the others, they mean universities ($M=4.19$), other firms ($M=4.17$) and the government ($M=4.04$).

As a second point, the relationship between knowledge and knowledge economy associated terms has been scrutinized. For students, knowledge economy increasingly relies on the diffusion and use of knowledge, as well as its creation ($M=4.43$). Furthermore, the innovation system and its "knowledge distribution power" are critically important ($M=4.05$). When we focus on, knowledge itself, participants demonstrated that accessing knowledge is easier ($M=4.16$) and moderately cheaper ($M=3.73$). Besides, they mostly supported the idea that knowledge plays an important role in the economy ($M=4.30$) and the power of knowledge is essential for economical activities ($M=4.24$). Lastly, they noted that creativity ($M=3.83$), problem solving ($M=3.99$) and openness to change ($M=4.17$) are increasingly important skills.

The third theme revealed from the questionnaire is the effect of globalization. The effect of globalization on economical activities are increasing ($M=4.29$) whereas the rich are getting richer, while the poor are getting poorer ($M=4.06$). Participants stated that the communication power of ICTs has engendered globalization ($M=4.11$) where globalization has been driven by national and international deregulation (3.98). The world competition has been empowered by globalization ($M=3.88$). In that sense, the growth of the

information industries is creating a knowledge-dependent global society (3.85) where globalization presents new challenges for science and technology policy ($M=3.34$).

Another theme appeared regarding European Union and Turkey relationship under the knowledge economy topic. With respect to the other items, participants have hesitated about EU and Turkey relationship, thus, the mean scores for those items have diminished. For instance, the item stating "relaxation of borders within the European Union has brought new mobility to the labor force" has averaged 3.52. The membership of Turkey to EU will be beneficial for the EU economy has been pointed as 3.58. Vice versa, the membership of Turkey to EU will be beneficial for Turkish economy has got 3.54 where the same mean has been calculated for the item delineating that Turkish economy will learn from EU countries. The counter item noting that EU economy will be benefitted from Turkish economy has been graded as 3.08. Lastly, participants moderately agree with the idea that Turkey's membership to EU will shape ICT-based society ($M=3.56$).

ICT and knowledge economy association has been the last theme identified from this study. For modern world, computer competence is compulsory ($M=4.28$). A result of advances in ICTs, world competition has been strengthened ($M=4.02$). The augmentation of knowledge is being driven by the forces of the ICT revolution ($M=3.99$), above and beyond, the investment for ICTs is a complementary of investment for human capital ($M=3.91$). The innermost characteristic of the ICT revolution is the ability to manipulate, store and convey the information for very low cost ($M=3.66$). On the other hand, participants do not agree that the result of ICT development is the result of low costs ($M=2.98$). More specifically, the Internet makes it possible for SMEs to compete among such a highly competitive business world.

The differences in perspectives to knowledge economy between genders were statistically checked by independent samples t-test for each item. Table 3 demonstrates only the significantly differing items where their descriptions are shown in Table 2.

Table 3. The differences between items in relation to gender

Item No	Gender	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
3	Female	43	4.07	0.74	-2.88	.005
	Male	51	4.47	0.61		
7	Female	43	4.28	0.63	2.03	.045
	Male	51	3.97	0.85		
44	Female	42	4.19	0.86	2.15	.035
	Male	51	3.78	0.84		
45	Female	42	4.36	0.69	2.55	.013
	Male	51	3.92	0.91		
50	Female	42	3.45	1.29	2.59	.011
	Male	51	2.76	1.26		

Males believe more than females that the globalization influences our economical activities. In contrast, females think that globalization is a result of development in ICT. For the e-commerce idea, females support more than males that e-commerce yields globalization and trigger consumption society. Lastly, with respect to males, females identified that EU economy will benefit from Turkish economical experiences.

The differences in perspectives between departments in relation to items were statistically checked by one-way analysis of variances (ANOVA) test. Table 4 demonstrates only the significantly differing items.

Table 4. The differences between items in relation to departments

Item No	Departments	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Test of Homogeneity of Variances</i>	<i>F</i>	<i>p</i>
1	Economics	50	4,50	4,32	0,57	3,37	0,039
	Management	32	4,03	3,70			
	Tourism Management	12	4,17	3,46			
3	Economics	50	4,44	4,28	2,50	3,39	0,038
	Management	32	4,19	3,94			
	Tourism Management	12	3,92	3,28			
11	Economics	50	4,04	3,80	3,87	6,18	0,003
	Management	32	3,50	3,10			
	Tourism Management	12	3,08	2,39			
12	Economics	50	3,90	3,66	1,40	4,98	0,009
	Management	32	3,31	2,99			

	Tourism Management	12	3,58	3,26			
38	Economics	49	3,84	3,58	0,76	6,04	0,003
	Management	32	3,06	2,69			
	Tourism Management	12	3,42	2,68			
39	Economics	49	4,06	3,88	4,25	5,51	0,006
	Management	32	3,53	3,21			
	Tourism Management	12	3,83	3,59			
48	Economics	49	3,86	3,55	0,48	3,96	0,022
	Management	32	3,16	2,75			
	Tourism Management	12	3,42	2,68			
49	Economics	49	4,00	3,66	0,33	7,95	0,001
	Management	32	2,94	2,52			
	Tourism Management	12	3,25	2,39			

From the number of participants for each group, it can be realized that numbers varied to a great extent for each group. In that sense, the departmental difference must be perceived more sensitively where the mean score of Economics department is higher than the other departments.

The differences in perspectives to knowledge economy between grades were statistically checked by independent samples t-test for each item. Table 5 demonstrates only the significantly differing items.

Table 5. The differences between items in relation to grades

Item No	Grades	N	M	SD	t	p
1	3 rd Grade	53	4.00	0.94	-4.25	.000
	4 th Grade	41	4.68	0.47		
2	3 rd Grade	53	4.00	0.83	-3.73	.000
	4 th Grade	41	4.56	0.55		
15	3 rd Grade	53	3.70	0.91	-3.68	.000
	4 th Grade	41	4.32	0.65		
16	3 rd Grade	53	3.91	0.79	-2.35	.021
	4 th Grade	41	4.24	0.54		
17	3 rd Grade	53	4.09	1.06	-2.13	.036
	4 th Grade	41	4.49	0.60		
20	3 rd Grade	52	4.00	0.95	-2.23	.028
	4 th Grade	41	4.39	0.67		
24	3 rd Grade	52	4.27	0.87	-2.36	.020
	4 th Grade	41	4.63	0.54		
35	3 rd Grade	52	3.73	0.95	2.01	.047
	4 th Grade	41	3.29	1.15		
37	3 rd Grade	52	3.58	1.02	2.53	

Item No	Grades	N	M	SD	t	p
49	4 th Grade	41	3.05	0.97	-2.31	.013
	3 rd Grade	52	3.27	1.33		
	4 th Grade	41	3.88	1.17		
50	3 rd Grade	52	3.42	1.29	3.00	.003
	4 th Grade	41	2.63	1.22		

In general, fourth grade students averaged more than third grade students except for the items 35, 37, and 50. Item 35 focusing on human resource development is much more essential for policy establishment where the item 37 shows that globalization is a problem for science and technology policy development. Item 50 compares European Union and Turkish economies in which third grade students support the idea more than the fourth grade students that EU will benefit from Turkish economy.

As a conclusion, students' opinions are clustered in five major themes concerning the knowledge economy. Students from Economics, Management and Tourism Management departments believe that firms and their position in knowledge economy, the relationship between knowledge and knowledge economy, the effect of globalization, EU and Turkey relationship, and ICT and knowledge economy association are all the fundamental standpoints of knowledge economy and major distinct concepts and phenomena regarding knowledge economy. Although females and males differ in some items about economic activities, the effect of globalization and ICT in knowledge economy, and departmental difference are seen only in Economics about the items. In general, fourth grade students differ from third grade students in that their mean scores are higher for most of the items that statistically significant.

3. Further Studies and Limitations

In answering the perspectives of youth concerning knowledge economy presented in this study, additional researches would help further understanding of knowledge economy and the relationships between other issues, ideas and concepts with knowledge economy. As this study is the preliminary attempt, more in-depth research studies will yield more application concerning knowledge economy. More investigation into specific application of knowledge economy might pave the way to understand more about the knowledge economy. The results of this study are limited to a small number of participants from different departments which were selected carefully and to the items we focused.

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