

KNOWLEDGE TRANSFER ACROSS PEER AND MULTIGENERATIONAL TEAMS OF EMPLOYEES

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Purpose: identification of differences in methods, forms and IT channels of knowledge transfer used in employee peer and multigenerational groups.

Design/methodology/approach: preferences for knowledge transfer in peer groups were assumed on the basis of a benchmark survey conducted by researchers at Jagiellonian University in 2020. On the other hand, preferences for knowledge transfer in multigenerational groups were identified on the basis of original studies conducted in April and May 2023.

Findings: it was noted that there are differences in the preferred ways, forms and channels of knowledge transfer in the studied employee groups.

Research limitations/implications: The comparative study was carried out in two specific social groups (academic and military), therefore further research should be conducted in other sectors, especially economic ones.

Practical implications: a positive phenomenon for businesses is the willingness of younger employees to acquire knowledge through direct contact with older employees with higher seniority.

Social implications: a positive phenomenon for businesses is the willingness of younger employees to acquire knowledge through direct contact with older employees with higher seniority. This attitude is conducive to building intergenerational knowledge networks and shaping a knowledge management strategy based on trust, while contradicting the thesis that young employees do not engage in the process of intergenerational knowledge transfer.

Originality/value: The basic value of the conducted research is to refute the stereotype according to which young employees prefer functioning in the virtual world and do not appreciate direct relationships; The above stereotype combined with the lack of trust confirmed in the literature resulted in a tendency to separate peer groups, which made it difficult, among others, knowledge transfer. The willingness of young employees to acquire knowledge from older mentors, indicated in this research, should be the foundation for building a knowledge transfer strategy based on intergenerational employee integration and motivational tools (financial and non-financial) encouraging employees to share knowledge.

Keywords: knowledge transfer, peer teams, multigenerational teams.

Category of the paper: research paper.

Introduction

The occurrence of multigenerational teams in businesses is not a new phenomenon, nor is the issue of intergenerational knowledge transfer. What distinguishes the current situation from the past is specificity of: 1) the labor market (i.e., hybridity of work, dispersion of work teams, workforce diversity, demographic and competency mismatches among employees, uncertainty and volatility of the environment); 2) the young generation entering and present in the labor market (characterized by, i.a., a growth mindset, high level of acceptance of changing jobs, and lack of authority figures) (PWC, 2022; Statistics Poland, 2023). Accordingly, managing a multigenerational team has become a key component of a business's diversity management, where a knowledge management strategy takes priority (Walczak, 2011). The relevance of this strategy is also emphasized from the perspective of securing business continuity. A change in the approach to knowledge management, namely shifting focus from knowledge accumulation to knowledge creation, transfer, and promoting a culture of information sharing, especially in multigenerational teams, is gaining significance (Balcerzyk, 2021). The Global Human Capital Trends report identified knowledge management as one of three key conditions for business success. Additionally, the report identified that businesses where knowledge transfer is prioritized are perceived by employees as more competitive in terms of revenue growth and customer satisfaction. Employees view such organizations as more innovative and attractive (Deloitte, 2020). In the context of two key trends, namely the generational workforce diversity, and the relevance of knowledge transfer, the disturbing phenomenon of not sharing knowledge among coworkers from different generations mainly related to lack of trust and mischaracterizations (stereotypes) of representatives of different generations should also be noted (Lipka, 2019).

Therefore, the purpose of the work was to identify differences in the methods, forms and IT channels of knowledge transfer used in employee peer and multigenerational groups. Moreover, given the above statement, it was decided to verify the following hypotheses:

- H1: there are significant differences in preferred modes of knowledge transfer across employees in peer and multigenerational groups.
- H2: there are significant differences in the preferred forms of knowledge transfer across employees used in peer and multigenerational groups.
- H3: there are significant differences in information channels preferred for knowledge transfer across employees used in peer and multigenerational groups.

In addition, three research questions were formulated:

- Q1: do young employees with up to 2 years of seniority differ from young employees with 4-5 years of seniority in terms of preferred sources of knowledge?
- Q2: are there differences between young employees with up to 2 years of seniority and young employees with 4–5 years of seniority in terms of preferred forms of knowledge sharing?
- Q3: are there differences between young employees with up to 2 years of seniority and young employees with 4-5 years of seniority in terms of preferred ICT solutions for knowledge sharing in teams?

It should be clarified that: 1) the research questions intentionally used the term “young employees” because older people may also have little seniority; 2) the employees’ preference was for knowledge transfer in multi-generational teams.

Literature review

Lahaie (2005) formulated a claim according to which 42% of corporate knowledge lies in employees, therefore businesses (that fail to recognize the need for knowledge management) are directly and severely affected by the loss of knowledge by departing staff, especially senior executives. Consequently, growth-oriented organizations are increasingly relying on competitive knowledge transfer-oriented strategies in which learning, innovation and continuous individual development are key (Matlay, 2000; Stevens, 2010). Knowledge transfer methods must be differentiated according to the existing age groups of employees in a business and their preferred learning styles (Wagner, 2009). Piktials and Greenes (2008), who studied gaps in knowledge loss, stressed that two of the best methods for acquiring and transferring knowledge between generations are adapting knowledge transfer methods to current needs and being clear about learning preferences of each generation. Intergenerational understanding and communication, including knowledge transfer in businesses, seems difficult due to the obvious differences between employees who are at different stages of their careers, who are guided by different values in life, who use different methods and tools in acquiring knowledge, and who build professional and social relationships differently (Richert-Kaźmierska, 2011). On the other hand, it is also indicated that age is not correlated with the propensity of a given employee to participate in the knowledge sharing process, it rather depends on the employee’s personal characteristics (Dziadek, 2019; Stefaniak-Hrycko, 2011). Instead, propensity for knowledge sharing is influenced by factors such as team atmosphere, empowering leadership (Xue et al., 2011), interpersonal trust and norms of reciprocity (Chen, Hung, 2010). These factors can be broadly divided into three categories: organizational, individual and technological. Organizational factors include culture, structure, and leadership, while individual factors

include personal beliefs, expected rewards, and connections (Fullwood, Rowley, 2017; Goswami, Agrawal, 2018). In addition, it is worth noting that knowledge sharing in multigenerational teams can occur in bidirectionally (Stevens, 2010), as employees (irrespective of their age) tend to turn to others when they need to gain the knowledge necessary to quickly solve problems and complete work tasks on an ongoing basis (Fryczyńska, 2022). Regarding relatively new technological knowledge, older generations can benefit from the knowledge of younger coworkers (Prensky, 2001). Whereas, in the context of the demographic transition, intergenerational knowledge transfer can be aimed at knowledge sharing by older employees to the benefit of younger coworkers and the organization as a whole (Burmeister, Deller, 2016; Gerpott et al., 2017). This is because the stock of knowledge increases along with the level of education and work experience of individuals (Fryczyńska, 2022).

In the intergenerational context, the concepts of knowledge transfer (KT) and knowledge sharing (KS) also need to be distinguished. Paulin and Suneson (2015) and Fryczyńska (2022) analyzed KS and KT in terms of directionality, focus and the level at which they occur. KS is multidirectional, concentrated or unfocused, and occurs between units. KT is unidirectional, clearly focused and occurs among individuals, teams, units or organizations (Paulin, Suneson, 2015). According to Tangaraj et al. (2016), KS is a completely behavioral concept because it includes observable actions, while KT is not an entirely behavioral concept as it includes both behavioral and non-behavioral traits through various processes. Beyond this, the literature distinguishes the concept of knowledge flow (KF), which typically occurs in multinational businesses, from headquarters to subsidiary, and occurs through such means of communication as the Internet. KF is more focused on transferring codified knowledge using information technology (Zhuge, 2006). Thus, assuming the KT perspective, it was necessary to see if there were differences in the transfer of professional knowledge processes in peer and multigenerational groups. Indirectly, knowledge of adult learning mechanisms (andragogy) was also verified, since in terms of age, all the people surveyed are adults.

Original research

Knowledge transfer preferences in peer groups were obtained from a reference survey conducted at two Polish universities (Budzanowska-Drzewiecka et al., 2020). Whereas, knowledge transfer preferences in multigenerational groups were identified on the basis of original surveys conducted in April and May 2023. By design, the study was conducted in two stages. The first step was to gather the opinions of people aged 21-25 among, with 2-5 years of seniority, on intergenerational knowledge transfer solutions. The study was conducted in a group of N = 308 using the case study method. The subjects were given a management problem to solve, which consisted in indicating safeguards for a fictitious business against loss

of knowledge. The situation assumed that 10 employees were to leave the organization within the next two years (the employees were aged 40-50 and had more than 15 years of seniority). The organization had no formally codified knowledge, the knowledge was in the possession of designated employees. In order to safeguard against loss of knowledge, the organization has hired 10 young employees. Respondents were asked to propose a knowledge transfer strategy between the two workforce groups. The obtained results were subjected to coding.

During the second stage, the results obtained were compared with a reference model — peer group knowledge transfer preferences (Budzanowska-Drzewiecka et al., 2020). In this case, the survey was conducted in a group of N = 414 respondents, who were students at two Polish universities.

Table 1.
Sources of knowledge preferred for learning tasks

Statement	Peer group reference model	Multigenerational group model
	A	B
Use of publicly accessible websites	1	6
Use of platforms that allow content co-creation and sharing	2	4
Use of social media	3	8
Consultation with peers	4	3
Use of platforms available through the organization's IT resources	5	5
Consultation with mentors	6	1
Consultation with friends outside the organization	7	7
Use of library resources	8	9
Use of digital databases	9	2
Use of social media for professionals in a particular sector	10	0

The numbers in columns A and B indicate the place in the ranking determined on the basis of the number of respondents' indications, where 1 means the highest place, and 10 - the lowest; the number 0 means that no respondent indicated a given statement.

Source: own.

It was found that in the peer group, there was a preference for using publicly available websites and platforms that allow content co-creation and sharing. In contrast, young employees who are expected to take over knowledge from older employees primarily preferred mentor consultations and digital databases (tab.1). Therefore, hypothesis No. 1 was positively verified, according to which there are significant differences in the preferred methods of knowledge transfer in employee peer and multigenerational groups.

Table 2.
Preferred forms of knowledge sharing

Statement	Peer group reference model	Multigenerational group model
	A	B
Online chat	1	4
Social media	2	2
Directly, during face-to-face meetings	3	1
Groupware platforms	4	5

Cont. table 2.

Telephone	5	3
E-mail	6	3
Online forums	7	6

The numbers in columns A and B indicate the place in the ranking determined on the basis of the number of respondents' indications, where 1 means the highest place, and 10 - the lowest.

Source: own.

Differences were also identified in terms of preferred forms of knowledge sharing. In the peer group, electronic form (chat) was preferred, while in the multigenerational group it was direct contact (tab. 2). This allows us to conclude that hypothesis No. 2 was also positively verified

Table 3.

ICT solutions supporting knowledge sharing

Statement	Peer group reference model	Multigenerational group model
	A	B
Wikis created by employees together with mentors, available to employees of the organization	1	0
Mobile app tailored to employees' knowledge sharing needs	2	5
Wikis created by employees for employees of the organization	3	1
Intraorganizational platforms	4	4
Enriching operating system functionality (ERP)	5	0
Information website	6	3
Public forums and discussion groups	7	2
Private forums and discussion groups	8	6

The numbers in columns A and B indicate the place in the ranking determined on the basis of the number of respondents' indications, where 1 means the highest place, and 10 - the lowest; the number 0 means that no respondent indicated a given statement.

Source: own.

There are also slight differences in terms of preferred ICT solutions to support knowledge sharing, however, a common feature is the use of knowledge base co-creation platforms (wikis) (tab. 3). Hypothesis No. 3 was therefore positively verified; the differences identified are significant. Based on the results obtained, attention should be paid to implementing solutions available on publicly available platforms in multigenerational groups.

In order to answer the research questions posed, statistical analyses were conducted using the IBM SPSS Statistics 29 package. With its help, a chi-square test of independence was performed. The significance level in this Chapter was assumed to be $\alpha = 0.05$. First, it was examined whether young employees with up to 2 years of seniority differ from young employees with 4–5 years of seniority in terms of preferred sources of knowledge (tab. 4).

Table 4.

Results of the chi-square test of independence verifying differences between young employees with up to 2 years of seniority and those with 4-5 years of seniority in preferred knowledge sources

Variable		First level of training		Second level of training		Total		χ^2	<i>p</i>	ϕ
		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%			
Use of publicly available websites	Not the most preferred	149	94.3	137	91.3	286	92.9	1.02	0.378	0.06
	Most preferred	9	5.7	13	8.7	22	7.1			
Use of platforms that allow content co-creation and sharing	Not the most preferred	131	82.9	110	73.3	241	78.2	4.15	0.053	0.12
	Most preferred	27	17.1	40	26.7	67	21.8			
Use of social media	Not the most preferred	150	94.9	138	92.0	288	93.5	1.09	0.358	0.06
	Most preferred	8	5.1	12	8.0	20	6.5			
Consultation with peers	Not the most preferred	107	67.7	113	75.3	220	71.4	2.19	0.165	0.08
	Most preferred	51	32.3	37	24.7	88	28.6			
Use of platforms available through the organization's IT resources	Not the most preferred	136	86.1	102	68.0	238	77.3	14.32	<0.001	0.22
	Most preferred	22	13.9	48	32.0	70	22.7			
Consultation with mentors	Not the most preferred	33	20.9	60	40.0	93	30.2	13.34	<0.001	0.21
	Most preferred	125	79.1	90	60.0	215	69.8			
Consultation with friends outside the organization	Not the most preferred	135	85.4	150	100.0	285	92.5	23.60	<0.001	0.28
	Most preferred	23	14.6	0	0.0	23	7.5			
Use of library resources	Not the most preferred	151	95.6	150	100.0	301	97.7	6.80	0.015	0.15
	Most preferred	7	4.4	0	0.0	7	2.3			
Use of digital databases	Not the most preferred	62	39.2	55	36.7	117	38.0	0.22	0.725	0.03
	Most preferred	96	60.8	95	63.3	191	62.0			

Source: own.

The analysis showed that young employees with up to 2 years of seniority, less often preferred using platforms available through the organization's IT resources than young employees with seniority of 4-5 years, while the former more often preferred consulting mentors and friends outside the organization and using library resources as a source of information. The value of the phi coefficient indicates that these differences were definitely minor.

Next, it was examined whether there were differences between young employees with up to 2 years of seniority and young employees with 4-5 years of seniority in terms of preferred forms of knowledge sharing (Table 5).

Table 5.

Results of the chi-square test of independence verifying differences between young employees with up to 2 years of seniority and those with 4-5 years of seniority in preferred forms of knowledge sharing in teams

Variable		First level of training		Second level of training		Total		χ^2	<i>p</i>	ϕ
		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%			
Online chat	Not the most preferred	158	100.0	139	92.7	297	96.4	12.02	<0.001	0.20
	Most preferred	0	0.0	11	7.3	11	3.6			
Social media	Not the most preferred	53	33.5	22	14.7	75	24.4	14.89	<0.001	0.22
	Most preferred	105	66.5	128	85.3	233	75.6			
Directly, during face-to-face meetings	Not the most preferred	11	7.0	34	22.7	45	14.6	15.21	<0.001	0.22
	Most preferred	147	93.0	116	77.3	263	85.4			
Groupware platforms	Not the most preferred	158	100.0	145	96.7	303	98.4	5.35	0.026	0.13
	Most preferred	0	0.0	5	3.3	5	1.6			
Telephone	Not the most preferred	151	95.6	138	92.0	289	93.8	1.69	0.239	0.07
	Most preferred	7	4.4	12	8.0	19	6.2			
E-mail	Not the most preferred	151	95.6	138	92.0	289	93.8	1.69	0.239	0.07
	Most preferred	7	4.4	12	8.0	19	6.2			

Source: own.

It turns out that young employees with up to 2 years of seniority were less likely to prefer sharing knowledge within their team using online chats, social media sites and groupware platforms than young employees with 4-5 years of seniority, and more likely to prefer face-to-face meetings for knowledge sharing. The value of the phi coefficient indicates little difference between the compared groups.

Subsequently, it was examined whether there were differences between young employees with up to 2 years of seniority and those with 4-5 years in the choice of ICT solutions (Table 6).

Table 6.

Results of the chi-square test of independence verifying differences between young employees with up to 2 years of seniority and those with 4–5 years of seniority in preferred ICT solutions

Variable		First level of training		Second level of training		Total		χ^2	<i>p</i>	ϕ
		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%			
Wikis created by employees together with mentors, available to employees of the organization	Not the most preferred	146	92.4	144	96.0	290	94.2	1.81	0.227	0.08
	Most preferred	12	7.6	6	4.0	18	5.8			
Mobile app tailored to employees' knowledge sharing needs	Not the most preferred	122	77.2	133	88.7	255	82.8	7.08	0.010	0.15
	Most preferred	36	22.8	17	11.3	53	17.2			

Cont. table 6.

Wikis created by employees for employees of the organization	Not the most preferred	71	44.9	59	39.3	130	42.2	0.99	0.356	0.06
	Most preferred	87	55.1	91	60.7	178	57.8			
Intraorganizational platforms	Not the most preferred	139	88.0	108	72.0	247	80.2	12.36	<0.001	0.20
	Most preferred	19	12.0	42	28.0	61	19.8			
Information website	Not the most preferred	131	82.9	108	72.0	239	77.6	5.27	0.028	0.13
	Most preferred	27	17.1	42	28.0	69	22.4			
Public forums and discussion groups	Not the most preferred	92	58.2	107	71.3	199	64.6	5.78	0.017	0.14
	Most preferred	66	41.8	43	28.7	109	35.4			
Private forums and discussion groups	Not the most preferred	150	94.9	145	96.7	295	95.8	0.57	0.574	0.04
	Most preferred	8	5.1	5	3.3	13	4.2			

Source: own.

The analysis showed that young employees with up to 2 years of seniority were more likely to prefer team-based knowledge-sharing solutions such as mobile apps tailored to employees' knowledge-sharing needs and public forums and discussion groups than those with 4-5 years of seniority, and less likely to prefer intraorganizational platforms and websites. The value of the phi coefficient indicates little difference between the compared groups.

Summary

The formulated hypotheses were positively verified, confirming that there are differences in the preferred ways, forms and channels of knowledge transfer across employee peer and multigenerational groups. Remote forms of knowledge transfer dominate primarily in peer groups, while direct solutions (job training, consultations, discussions, other forms of training, etc.) are preferred in cases where a young employee is to acquire knowledge from an employee who is older and more senior. Differences in the preference of sources and forms of knowledge sharing resulting from the seniority of people in the same age group (21-25 years of age) were also identified. However, these are statistically insignificant differences. It is worth noting that even in terms of preferred ICT solutions, tools from the knowledge co-creation group dominate among respondents. This leads to the conclusion that young people want to actively participate in knowledge management within the organization and collaborate in the development of knowledge repositories. Moreover, since young employees want to directly acquire knowledge from older employees, it is necessary to create conditions for integration, trust building and security, which is conducive to the effective transfer of knowledge, and thus becomes a guarantee of business continuity in a situation of staff turnover.

Reference

1. Balcerzyk, R. (2021). Intra-Organizational Conditions in Knowledge Sharing. *European Research Studies Journal, Vol. 24, Special Iss. 1*, pp. 762-775.
2. Budzanowska-Drzewiecka, M., Lipińska, A., Teczke, M. (2020). Wzorce dzielenia się wiedzą między studentami. In: J. Cewińska, A. Krejner-Nowecka, S. Winch (Eds.), *Zarządzanie kapitałem ludzkim – wyzwania* (pp. 137-150). Warszawa: Oficyna Wydawnicza SGH.
3. Burmeister, A., Deller, J. (2016). Knowledge retention from older and retiring workers: What do we know, and where do we go from here? *Work, Aging and Retirement, no. 2*, pp. 87-104.
4. Chen, C.J., Hung, S.W. (2010). To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities. *Information & Management, Vol. 47, No. 4*, pp. 226-236.
5. Deloitte (2020). *Global Human Capital Trends 2020: Firmy odpowiedzialne w praktyce*. Retrieved from: <https://www2.deloitte.com/pl/pl/pages/human-capital/articles/nowe-metody-zarzadzania-wiedza.html>, 4.12.2023.
6. Dziadek, K. (2019). Problemy i wyzwania międzypokoleniowego transferu wiedzy we współczesnych przedsiębiorstwach. Wyniki badań. *Zeszyty Naukowe WSH Zarządzanie, no. 2*, pp. 73-91.
7. Fryczyńska, M. (2022). Determinants of knowledge transfer in egocentric networks, Comparative analysis of professions. *WSEAS Transactions on Business and Economics, no. 19*, pp. 40-53.
8. Fullwood, R., Rowley, J. (2017). An investigation of factors affecting knowledge sharing amongst UK academics. *Journal of Knowledge Management, Vol. 21, No. 5*, pp. 1254-1271.
9. Gerpott, F.H., Lehmann-Willenbrock, N., Voelpel, S. (2017). A phase model of intergenerational learning in organizations. *Academy of Management Learning & Education, no. 16(2)*, pp. 193-216.
10. Goswami, A.K., Agrawal, R.K. (2018). A reflection on knowledge sharing research: patterns and trends. *VINE Journal of Information and Knowledge Management Systems, no. 48(3)*.
11. GUS (2023). *Wybrane aspekty rynku pracy w Polsce*. Retrieved from: <https://stat.gov.pl/obszary-tematyczne/rynek-pracy/zasady-metodyczne-rocznik-pracy/wybrane-aspekty-rynku-pracy-w-polsce,4,3.html>
12. Lahaie, D. (2005). The impact of corporate memory loss. What happens when a senior executive leaves? *Leadership in Health Services, Vol. 18, No. 3*, pp. xxxv-xlvi.

13. Lipka, A. (2019). Zaufanie generacyjne a ryzyko personalne. In: A. Wojtczuk-Turek (Eds.), *Zarządzanie kapitałem ludzkim – wyzwania i trendy* (pp. 153-168). Warsaw: Oficyna Wydawnicza SGH.
14. Matlay, H. (2000). S/NVQs in Britain: employer-led or ignored? *Journal of Vocational Education and Training*, Vol. 52, No. 1, pp. 135-148.
15. Paulin, D., Suneson, K. (2015). Knowledge transfer, knowledge sharing and knowledge barriers – three blurry terms in KM. *Leading Issues in Knowledge Management*, Vol. 10, No. 1, pp. 752-760.
16. Piktialis, D., Greenes, K. (2008). *Bridging the Gaps: How to transfer knowledge in today's multigenerational workplace*. Retrieved from: <https://www.conference-board.org/publications/publicationdetail.cfm?publicationid=1532>.
17. Prensky, M. (2001). Digital natives, digital immigrants. Part 1. *On the Horizon*, No. 9(5), pp. 1-6.
18. PWC (2023). *Global Workforce Hopes and Fears Survey 2023*. Retrieved from: <https://www.pwc.com/gx/en/issues/workforce/hopes-and-fears-2022.html>
19. Richert-Kaźmierska, A. (2011). Międzypokoleniowy transfer wiedzy w przedsiębiorstwach. *Zeszyty Naukowe Uniwersytetu Szczecińskiego, no. 694, Ekonomiczne Problemy Usług, no. 80*, pp. 79-88.
20. Stefaniak-Hrycko, A. (2011). Międzypokoleniowy transfer wiedzy. In: A. Fabiś, M. Muszyński (Eds.), *Społeczne wymiary starzenia się* (pp. 33-48). Bielsko-Biała: Stowarzyszenie Gerontologów Społecznych i Wyższa Szkoła Administracji w Bielsku-Białej.
21. Stevens, R.H. (2010). Managing Human Capital: How to Use Knowledge Management to Transfer Knowledge in Today's Multi-Generational Workforce. *International Business Research*, No. 3, pp. 77-83.
22. Tangaraja, G., Mohd Rasdi, R., Abu Samah, B., Ismail, M. (2016). Knowledge sharing is knowledge transfer: a misconception in the literature. *Journal of Knowledge Management*, Vol. 20, No. 4, pp. 653-670.
23. Wagner, C. (2009). When mentors and mentees switch roles. *The Futurist*, Vol. 43, No. 1.
24. Walczak, W. (2011). Zarządzanie różnorodnością jako podstawa budowania potencjału kapitału ludzkiego organizacji. *e-mentor*, no. 3(40), pp. 11-19.
25. Xue, Y., Bradley, J., Liang, H. (2011). Team climate, empowering leadership, and knowledge sharing. *Journal of Knowledge Management*, Vol. 15, No. 2, pp. 299-312.
26. Zhuge, H. (2006). Knowledge flow network planning and simulation. *Decision Support Systems*, Vol. 42, No. 2, pp. 571-592.