

Knowledge Management Practices in the Polish Education System

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Abstract:

Education in the 21st century has ceased to exist as an enclave, in an environment driven by market forces, in the backwaters of the mainstream socio-economic developments. The condition of the system of education does not depend merely on the knowledge and professionalism of teachers. The *quality of management* plays an important role in this equation: poor management results in low quality of teaching.

The paper is the outcome of a nation-wide study of 1951 respondents (teachers, educators, headmasters, managers, local government officials etc.) representing all major institutions of the Polish primary and secondary education system (schools, in-service training centres, government supervising bodies etc.) conducted by the author in autumn 2007. A comprehensive analysis of all major aspects of knowledge management and related concepts was carried out. The paper presents the typology of knowledge assets based on three dimensions of knowledge: (a) tacit/codified; (b) *know-x*; (c) content/pedagogical/ organizational knowledge. The key research areas for KM in the Polish education system include: (1) Personal knowledge management and learning processes (with special emphasis on cultural preferences for the codified/personalized knowledge); (2) Knowledge creation/innovation; (3) Knowledge sharing, (4) The measurement of Intellectual Capital (5) Leadership in KM, (4) Intellectual Capital measurement; (5) Organizational culture and environment.

Some of the key findings reveal that:

- The employees in the Polish education systems prefer a person-to-person mode of knowledge transfer. The percentage of respondents preferring knowledge transfer through documents (people-to-document-to-people) is substantially lower (20.4%).
- The percentage of respondents who are ardent users of codified knowledge amounts to just 1.5%.
- Over 40% of employees have witnessed the breach of copyrights by other employees (e.g. unauthorized use of written materials, quotation without reference to the author, plagiarism),
- The percentage of people feeling aggrieved by a breach of copyright amounts to 15% and is substantially lower than the percentage of people who have witnessed (but have not been a victim of such occurrences (43.4%).

This paper is probably the first attempt to create a comprehensive framework for the analysis of knowledge management in educational institutions. The research is approach flexible and thus can be applied internationally.

Keywords: knowledge management, primary and secondary education, system approach

1. Introduction

Education in the 21st century has ceased to exist as an enclave, in an environment driven by market forces, in the backwaters of the mainstream socio-economic developments. The condition of the system of education does not depend merely on the knowledge and professionalism of teachers. The *quality of management* plays an important role in this equation: poor management results in low quality of teaching.

This paper describes the result of the research conducted in a nation-wide study of 1951 respondents (teachers, educators, headmasters, managers, local government officials, etc.) representing all major

institutions of the Polish primary and secondary education system (schools, in-service training centres government supervising bodies, etc.) conducted by the author in the autumn of 2007.

2. The Polish education sector

The Polish education system was radically reformed in 1999 in order to break-away from the legacy of the socialist past. The changes had been implemented gradually over several years. Today, nearly 10 years after the launch of the reform the current system is undergoing criticism. Some positive changes have been observed such as a better score in the PISA rankings for Poland. The most criticised area are school supervision and the poor implementation of the LLL (life-long learning) concept among teachers. Education is now compulsory from 7 till 18 but there are some non school alternatives from 16, including apprenticeships. The entry threshold will be lowered to 6 in 2009. There is also a debate in progress concerning the further lowering of this entrance age.

In Poland the Ministry for Education is responsible for the primary and secondary levels of education. Tertiary education is supervised by The Ministry for Ministry of Scientific Research and Information Technology. Access to pre-school education in Poland is substantially lower than in many other countries. In the year 2003 60% of children aged 2-5 did not participate in pre school education. In Poland pre-school education is provided in kindergartens and in 'kindergarten units' located within primary schools. In the school year 2004/2005 children in Poland for the first time were obliged to attend a one-year pre school preparation. In the same year there were 17,200 pre-school education units in Poland, including 7,700 kindergartens and 9,500 'kindergarten units' in primary schools. A total of 840,000 children were in the system, an increase of 8,100 compared with the previous year.

Following the reforms, upper secondary education takes place in one of four types of schools described below:

- 3 Year general lyceum offering general education leading to the Maturity Certificate, a requirement for entry to Higher Education (HE),
- 3 year specialized lyceum leading to the Maturity Certificate, but also offering a general vocational education in a chosen area,
- 4 year technical lyceum leading to the Maturity Certificate and vocational qualifications at technician level, and
- 2-3 year basic vocational school leading to skilled worker qualifications.

Both general and vocational education programmers seek to develop the five key competences: planning organizing and self management of the learning process, communication, team work, problem-solving and application of IT.

School based vocational education includes practical training in school, practical training centers, continuing education centres and employers' premises and periods of placement with employers.

Complementary 2 year general and 3 year technical secondary schools offer routes to the Maturity Certificate and technician qualifications for students in basic vocational schools.

Post secondary schools enable general and specialized secondary school leavers to obtain vocational qualifications at skilled worker and technician levels. This sector also includes centers offering part-time programmers for adults.

The main challenges for the Polish education are:

- Provision of education which is suitable for the KBA,
- Tackling the problem of social exclusion of underprivileged groups,
- Cultural education, especially for children from rural areas in order to allow them a fair-competition on the job market with the children from large metropolitan areas,
- Education in the field of social capital. Poland scores the lowest in the European rankings of citizen participation in public life and trust,
- Improving the access to IT infrastructure, especially in rural areas of Eastern Poland,
- A radical reconstruction of the in-service teacher training system which is ineffective and overly decentralize,
- Increasing the quality of graduate courses for teachers in universities,

- Rationalizing the teacher salary system which currently offers extremely low salaries for young teachers (ca. Euro 290,00 per month i.e., 1/3 of national average). Educational institutions simply cannot compete for the best talent on the Polish job market.

3. KM – a new approach towards school reform in Poland

Since knowledge offers the competitive edge to nations and organizations in the 21 c. it is wise to assume that the education sector should benefit by the implementation of a knowledge management concept in order to improve its efficiency and make it more adapted to the challenges of the new millennium. The author carried out a thorough research study sponsored by the Polish Ministry for Science and Higher Education. Its aim was to diagnose the opportunities for the implementation of KM concepts into educational institutions and to investigate the current state of KM. The space does not allow for the full description of the research results. Here only some selected research findings are presented.

4. The measurement of knowledge management in the education sector

Effective management of organizations requires the effective management of knowledge resources. Modern primary and secondary education (*oświata*) in Poland requires a modern approach to solving the system problems. With over 600,000 teachers, 40,000 headmasters and thousands of officials working for state-run and municipal supervisory units, the management of the Polish education is a daunting task. Some solutions which seem to work in countries such as Finland (population 5.3 million) are simply not applicable in Poland e.g. it is virtually impossible to abolish the current mid-level of management of schools between the Ministry for Education and the headmasters.

Currently the following players constitute the Polish education system:

1. The Ministry for Education with several specialized departments, based in Warsaw.
2. Sixteen Educational Supervisory Bodies (*Kuratorium*) supervising schools at regional level on behalf of the Ministry.
3. 700+ local government administration bodies responsible for education.
4. Nearly 150 public in-service teacher training centres financed by the central government or local authorities.
5. Nearly 50,000 schools and other educational institutions (e.g., kindergartens, libraries, etc.)
6. A Central Examination Board with several regional units.
7. Universities, other state-run and private higher education schools offering M.Sc. and M.A. courses for teachers.
8. Other groups of auxiliary institutions e.g., NGOs operating in the field of education.

Currently most schools are operating under dual-supervision system. The education offices are representing the interests of the Ministry of Education at the regional level to ensure the quality of education, equal rights and the national curriculum, etc. Simultaneously, the local government is financing the daily operations of schools, salaries and teacher training. Simply speaking, each headmaster (with some exemptions) answers to two supervisors. Often the knowledge flow between them is poor which creates coordination problems and occasional conflicts.

The Polish education system employs a variety of professional groups (communities of professionals):

1. Teachers (there are 11 types of teaching positions).
2. Headmasters (school directors and vice-directors).
3. Educators employed at the in-service teacher training centers.
4. Government officers including some 1,600 school supervisors whose responsibility is visiting a given number educational units within a district.
5. Local government officers working for education departments.
6. Other less numerous groups.

Thus the map of KM in Polish education should consider both institutions and communities of professionals. The research conducted by the author is not representative in all aspects since the number of independent variables characterising each potential respondent is very high. Nevertheless the sheer number totaling 1951 respondents who originated from 14 of the 16 Polish provinces, provides a large sample for analysis.

The focal point of the research was the identification of three dimensions of knowledge in the education sector:

- *Embeddedness*: tacit/explicit (codified),
- *Know-x* (where *x* is accordingly: *what, why, how, who*),
- *Application*:
 - (a) Curriculum knowledge (including culture) – what to teach?
 - (b) Pedagogical (how to teach in the teacher-student relationship?)
 - (c) Managerial/organizational knowledge – how to manage schools on micro (headmaster), mezzo (regional supervisory boards) and macro level (the Ministry for Education)?

The following processes are crucial for the analysis of KM:

- (1) Personal knowledge management,
- (2) Codification and personalization of knowledge,
- (3) Knowledge sharing,
- (4) The measurement of intellectual capital,
- (5) Knowledge creation,
- (6) IP rights - knowledge protection,
- (7) The quality of the environment of KM.

Therefore the thorough analysis of KM represents a three-dimensional approach.

This paper presents some of the most interesting findings. The comprehensive version of the research will be published in a book by the Poznan University of Economics in 2008/09.

The process of data collection was conducted via web survey. Table 1 shows the breakdown of respondents according to professions. Unfortunately, only one person from the Ministry for Education responded to the survey in 2007).

Table 1: Professional groups among respondents

	No. of respondents	Share of respondents
Headmasters	811	49,6%
Certified teachers	447	27,3%
Vice-headmasters	175	10,7%
Nominated teachers	145	8,9%
Contract teachers	64	3,9%
School educators	22	1,3%
Teachers-in-training	10	0,6%
Other teaching positions	6	0,4%
Other (mostly school inspectors)	65	4,0%

A concise review of selected research findings is presented below.

4.1. Personal knowledge management and training content

Personal knowledge management (PKM) represents a bottom-up approach to knowledge management. The responsibility for upgrading the knowledge of employees rests primarily with them. The educational institutions provide some incentives for teachers taking part in the LLL process.

A good proxy for the effectiveness of KM is a subjective evaluation of one's own professional progress. When asked if their professional effectiveness had increased in the last 2 years, 92% school workers said yes. Interestingly enough, over 98% workers from kindergartens agreed – an even higher percentage.

From those who answered positively to the previous question, another filtering question was asked: "In your opinion the increase was: a) moderate b) substantial". Nearly 79% respondents admitted that their progress in job effectiveness was "substantial".

It is worthwhile to look at how the three areas of application of knowledge are represented in the in-service training courses in Table 2. It appears that courses covering the recent changes in the legal

regulations are most popular, but other courses on managerial/organizational knowledge not related to legal issues are also popular (57,5%).

Table 2: Content of training

Type of content: “If you have participated in any in-service training within the last 6 months, please state what was the content of the training”:	No. of respondents who have been attending course(s) with the given type of content	Share among the respondents
Managerial/organizational knowledge - legal	1280	69,8%
Managerial/organizational knowledge – other than legal	1056	57,5%
Pedagogical knowledge	814	44,4%
Curriculum knowledge	660	36,0%

4.2. Codification and personalization of knowledge

Hansen *et. al.* (1999) mention two KM strategies that are commonly used by successful consultancy organizations. Personalization strategy is about utilising the full potential of personal relationships between knowledge workers. The codification strategy relies on the power of IT systems which can capture and allow re-using of previously stored knowledge. Neither of the two strategies is superior in principle.

The key aspect of knowledge management is the identification of the sources of knowledge. A list of 19 main possible sources of knowledge for educational sector employees was identified. After the collection of data, each source was tagged either P (for personal knowledge, 7 sources) or C (for codified knowledge, 11 sources). Table 3 shows the number of respondents who indicated every source of knowledge.

Table 3: Sources of knowledge

	Type of knowledge	No. of respondents who indicated this source	Share
Conversations with colleagues	P	1411	78,5%
Legal documents	K	1405	78,1%
Training material obtained at training courses	K	1398	77,8%
Trade magazines and daily newspapers for teachers	K	1310	72,9%
Internal school training	P	1085	60,3%
Conversations with pupils	P	1031	57,3%
Reading of books on education	K	1006	56,0%
Training courses	P	827	46,0%
Conversations with	P	821	45,7%
Postgraduate studies	P	791	44,0%
Observation of more experienced colleagues at work	P	790	43,9%
Other books	K	706	39,3%
Conversations with scholars, scientific conferences	P	644	35,8%
Participation in on-line discussion groups	K	623	34,6%
Conversation with subordinates	P	553	30,8%
Support from the school supervisor	P	548	30,5%
E-learning courses	K	345	19,2%
Apprenticeship	P	341	19,0%
Cooperation with school advisor	P	316	17,6%

Based on the responses shown in table 1, three groups of education sector employees can be identified:

1. Type-N - "Neutral" – respondents who use codified and personalized sources of knowledge in a balanced way: if the difference between the number of indicated sources of knowledge equals zero the respondents is qualified as type-N.
2. Type-C – those respondents prefer codified sources of knowledge (documents). If the difference between the number of indicated sources of codified sources of knowledge exceeds zero the respondent is qualified as type-N.
3. Type-P – those respondents prefer personal sources of knowledge (people).

The most popular source of knowledge was conversations with colleagues: 78,5% respondents indicated this source of knowledge. But the following in order sources were type-K. Of all the sources indicated by more than 50% respondents four were type-C and three were type-P. Master-student type of learning ("Observation of more experienced colleagues at work") was practiced by 43,9% of respondents. Nearly one in five respondents participated in e-learning courses, but this figure is probably skewed because the IT-literate respondents are over-represented in the sample.

The distribution of workers belonging to each of the three categories is shown in table 4: nearly 60% of respondents are type-P, which means that, generally speaking, more employees of the educational system in Poland prefer personal knowledge.

Table 4: The distribution of workers belonging to each of the three categories

Type	No. of respondents	Share in the research sample
Type-N	391	20,1
Type-K	397	20,4
Type-P	1161	59,6

Table 5 shows in detail the preferences for codified vs. personal knowledge.

Table 5: Preferences for knowledge sources

K-P	No. of respondents	Share in the research sample
-8	7	0,4
-7	8	0,4
-6	51	2,6
-5	98	5,0
-4	152	7,8
-3	233	12,0
-2	272	14,0
-1	340	17,4
0	391	20,1
1	212	10,9
2	109	5,6
3	49	2,5
4	19	1,0
5	5	0,3
6	3	0,2

The share of respondents who are ardent users of codified knowledge ($K - P > 3$) amounts to only 1,5% whereas the share of respondents who strongly prefer personal knowledge ($K - P < - 3$) amounts to 16,2%.

Based on the above mentioned results, one can look at the relationship between the preferences for any of the two types of knowledge vs. the perceived increase in professional efficiency.

Table 6: Increase in professional efficiency

The subjective assessment: has your professional efficiency improved over the last two years?	Type-N	Type-C	Type-P	Total
Yes	67,8%	98,2%	98,4%	92,3%
No	16,6%	1,0%	0,4%	3,8%
Don't know	15,6%	0,8%	1,1%	4,0%

The Pearson test indicates $p = 0,000$ which means that there is a statistically significant relationship between belonging to a group and the subjective assessment. Type-N employees of the educational system in Poland are most likely to answer no to the question. One can conclude that no indication of preference toward the knowledge sources (codified vs. personal) has a negative impact the increase in professional efficiency.

Looking at the degree to which the professional efficiency improved (minor progress vs. substantial progress).

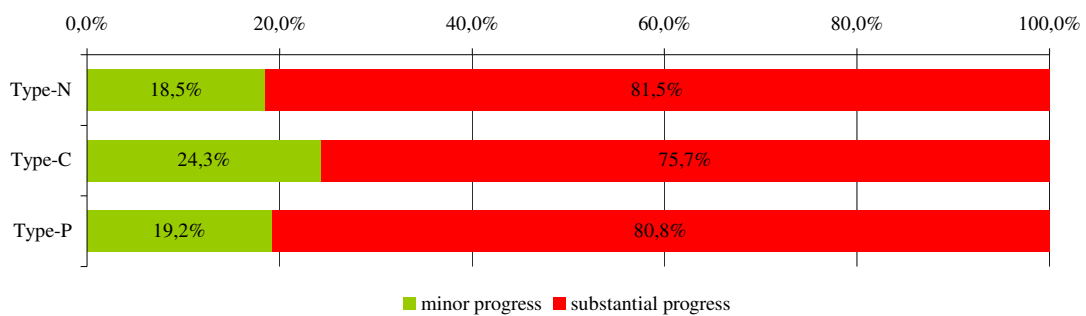


Figure 1: Degree of progress in self-development

4.3. Knowledge sharing

Over 75% respondents agreed that "their colleagues share with them their knowledge which is useful for their work", but one in five indicates that knowledge is not shared properly (figure 3).

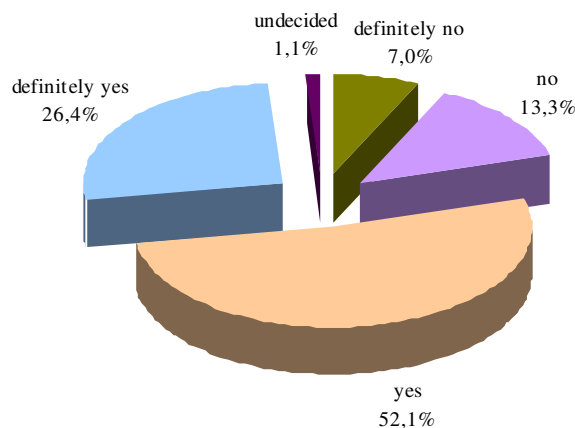


Figure 2: Knowledge sharing in Polish education: “Do your colleagues share their knowledge with you?”

Knowledge sharing is more intense in schools than in other institutions in the education sector (figure 3).

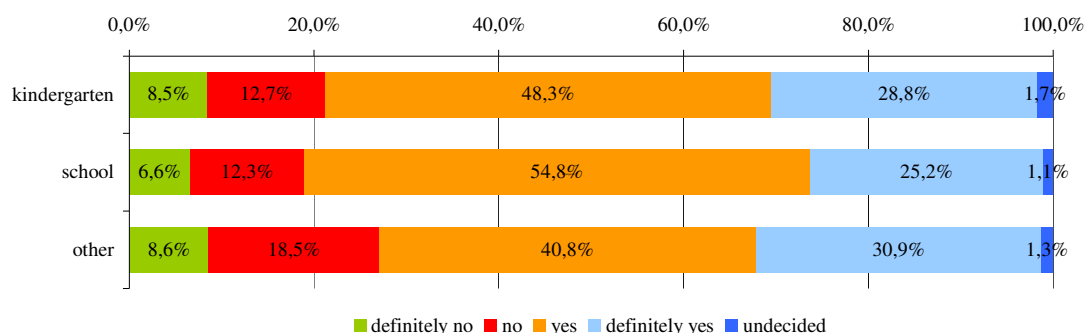


Figure 3: The intensity of knowledge sharing in schools vs. other institutions

Knowledge sharing is significantly less intensive in the local government education units: nearly 1/3 of respondents agreed that their colleagues do not want to share knowledge with them. Roughly 2/3 of respondents (1231 – 63,2%) reckon that after the abolishment of some barriers they would share their knowledge more willingly but 36,8% disagree.

Of those who reckon that they would share their knowledge more willingly (1231) 68,5% indicate “lack of time” as the main barrier (see: table 7).

Table 7: Barriers to knowledge management

Barriers	No. of respondents	Share
Other priorities – lack of time for knowledge sharing	843	68,5%
Lack of public spaces for socialization	502	40,8%
I lost my enthusiasm and commitment	327	26,6%
There exists individualistic organizational culture – no one is expected to share their knowledge	317	25,8%
I reckon that by sharing knowledge with others I will become expandable	89	7,2%

4.4. Relations with research institutions

Schools and kindergartens participate in research projects scarcely: only 13,6% of them declare any activity in this field. Other institutions are more likely to engage in research networks: 26,8% of respondents from other institutions agreed that their employer participated in a research project in the 2 years prior to the survey.

Regional in-service teacher training centres are most active group in the field of research and networking. Figure 4 shows that only 11% of local government units for education have been active in this field.

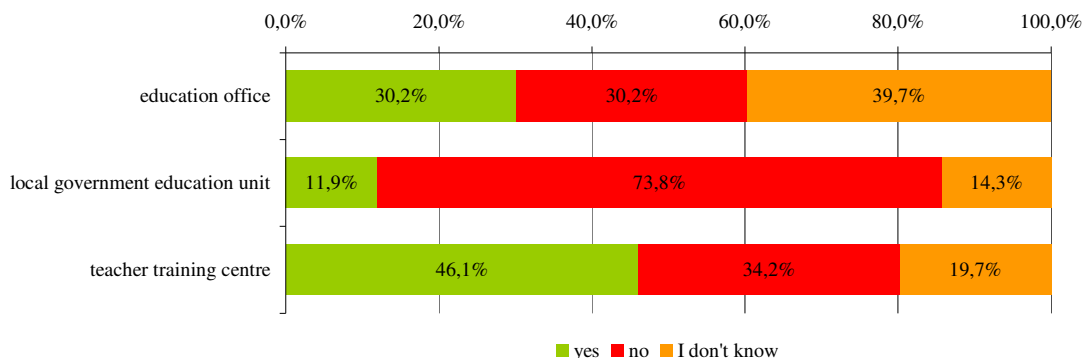


Figure 4: The intensity of educational sector-research institutions relations

4.5. The measurement of intellectual capital

Every third respondent agrees that intellectual capital (IC) measurement is practiced in some form in their home institutions, 20 % of respondents “don’t know” and 48,1% claim that IC is not measured.

4.6. Innovation and knowledge creation

Over 95% of respondents claim that they have authored a new idea, useful invention or improvement within the 12 months prior to the survey. The most innovative institutions are the Examination boards, whereas local government educational units seem to host the least active innovators (table 8).

Table 8. Innovation intensity in the Polish education system.

“Have you authored a new idea, useful invention or improvement within the 12 months prior to the survey ?”	Yes	No
Educational Supervisory Body	60,3%	39,7%
Local Government Administration Body Responsible for Education	58,7%	41,3%
Examination Board	88,9%	11,1%
In-service Teacher Training Centre	76,3%	23,7%

Small organizations seem to be slightly less innovative. The highest percentage of innovators work for institutions employing 101-150 workers (table 9). **The least innovative are institutions employing over 150 workers which supports the argument postulated by Robin Dunbar (quoted by Malcolm Gladwell) that social ties between people in groups numbering more than 150 dramatically weaken.**

Table 9: Innovativeness vs. number of employees

“Have you authored a new idea, useful invention or improvement within the 12 months prior to the survey.?” (no. of employees)	Yes	No
1-15	62,2%	37,8%
16-49	67,6%	32,4%
50-100	71,9%	28,1%
101-150	76,3%	23,7%
above 150	61,9%	38,1%

4.7. IP rights - knowledge protection

Education is an immaterial service and therefore the enforcement of intellectual property rights is more difficult than in the manufacturing sector. Nevertheless, effective knowledge management

requires some sort of consideration for protecting of knowledge. Over half of the respondents agree that lack or inadequate IP rights protection discourage creative individuals from innovation

Over 15% of respondents feel that their rights have been infringed by taking possession of/theft of unauthorized use of the results of knowledge work without the consent of the author. Figure 5 shows how what percentages of respondents feel victims of IP theft.

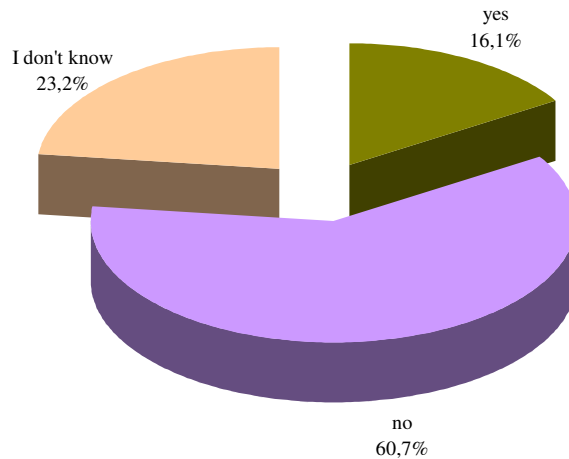


Figure 5: Victims of IP theft among the Polish education sector workers

Over 40% of respondents witnessed the infringement of IP rights by other workers of the education sector (e.g. unauthorized use of teaching materials, failing to use references etc.) IP rights infringement is more frequent in rural areas.

4.8. The quality of the environment of KM

In order to cover all the main issues concerning the quality of the environment for knowledge management a set of eight diagnostic questions was prepared (table 10). The breakdown of the answer to two of them is presented in figures 6 and 7.

Nearly 80% respondents agree that “the climate for cooperation is conducive for solving daily professional problems” (figure 6).

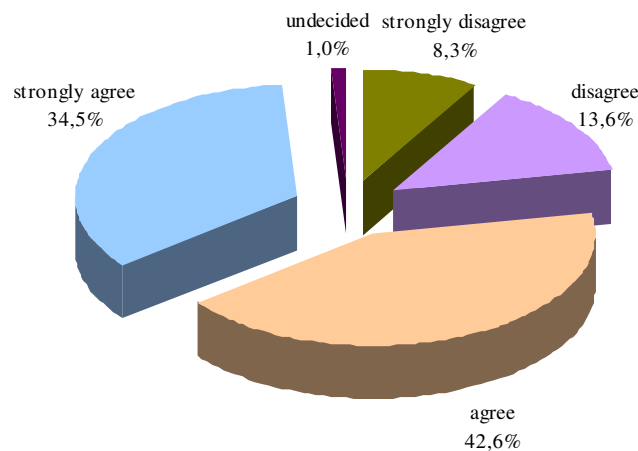


Figure 6: “The climate for cooperation is conducive for solving daily professional problems”

Almost every third respondent agrees that with the opinion that: "My colleagues do not want to share their knowledge – there exist a culture of individualism and self-reliance" (figure 8).

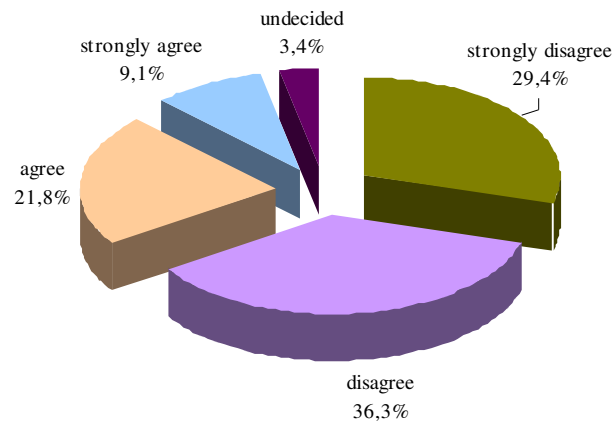


Figure 7: My colleagues do not want to share their knowledge – there exist a culture of individualism and self-reliance

Taking a more holistic view on the quality of the responses to each of the questions, one can compare the ratio of positive answers ("strongly agree" and "agree") to negative answers ("strongly disagree" and "disagree"). Table 9 presents the ratios depending on the diagnostic question and the type of organization: the higher the ratio the more positive diagnosis of the given aspect of the environment. In the case of question 8 the answers were reversed since this question's meaning is negative.

The institutions which are leaders in every field are highlighted in table 9.

Table 10: The quality of the environment of KM in Polish education sector

Diagnostic question	All institutions	Schools	Kindergartens	Examination boards	In-service training centres	Local government education units
1. The climate for cooperation is conducive for solving daily professional problems".	3,53	3,67	10,60	0,50	2,22	2,02
2. I work in the environment which motivates me for work.	2,99	3,03	5,82	1,00	3,41	1,70
3. People around me create new ideas.	2,82	3,06	4,14	1,25	3,17	1,07
4. The management cares about implementation of new ideas.	3,31	3,47	4,78	1,00	4,77	1,77
5. I participate in peer-review process.	3,95	4,21	3,91	1,25	3,69	2,33
6. The physical environment (facilities) is conducive for informal meetings.	0,95	0,99	0,89	0,33	1,77	0,58
7. My relationships with the direct supervisor are good.	4,16	3,90	8,30	2,00	9,43	3,96
8. My colleagues do not want to share their knowledge – there exist a culture of individualism and self-reliance.	2,13	2,11	4,85	1,25	0,11	1,52
Average	2,98	3,06	5,41	1,07	3,57	1,87

The highest quality for knowledge management characterizes Polish kindergartens, and the lowest is attributed to the Examination boards. The local government education units also score low.

5. Final conclusions

The Polish education sector is characterised by several different management cultures e.g. kindergartens are exposed to market forces and are most agile. On the other hand education offices are often criticised for bureaucracy and being out-of-touch. Some of the key findings reveal that:

- The employees in the Polish education systems prefer a person-to-person mode of knowledge transfer. The percentage of respondents preferring knowledge transfer through documents (people-to-document-to-people) is substantially lower (20.4%).
- The percentage of respondents who are ardent users of codified knowledge amounts to just 1.5%.
- Over 40% of employees have witnessed the breach of copyrights by other employees (e.g. unauthorized use of written materials, quotation without reference to the author, plagiarism),
- The percentage of people feeling aggrieved by a breach of copyright amounts to 15% and is substantially lower than the percentage of people who have witnessed (but have not been a victim of such occurrences (43.4%).

This paper is probably the first attempt to create a comprehensive framework for the analysis of knowledge management in educational institutions. The research approach is flexible, and thus can be applied internationally. The research outcomes can serve as benchmarks for comparisons among different educational systems. In this paper the blurred and poorly understood concept of KM is transformed into a concise, yet comprehensive framework. The wide spectrum of quantitative data collected by the author sheds a new light on the state of KM in education.

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