

PERCEIVED SELF-EFFICACY VS. ACTUAL LEVEL OF TRAINING IN PERSONAL INFORMATION AND KNOWLEDGE MANAGEMENT. A RESEARCH REPORT

Introduction

Alfred Bandura's social-cognitive theory of human behaviour (Bandura, 2007) is an inspiration for many scientists. He assumes that individuals with high sense of self-efficacy "visualize positive results of their actions, while those who doubt themselves most often visualize failure; [this assumption allows to conclude that] individuals with greater conviction of their own abilities (which is not necessarily justified) achieve more success, because they do not fear to take up ambitious tasks" (Kamińska-Czubala, 2016, p. 58; Juczyński, 2000). This paper refers to the results of a data analysis conducted by Barbara Kamińska-Czubala (Kamińska-Czubala, 2013). The analysis focuses on data presenting the level of students' perceived self-efficacy in various information-related activities. The author comments on the information behaviours of Generation Y in everyday life: "high efficiency in securing one's information comfort (...) is a characteristic feature of the information world, in which the respondents live" (Kamińska-Czubala, 2016, p. 71). In her research, the author proves that mutual relations in the information space are seen as less efficient than everyday information actions. Scales designed for that research allowed the respondents to evaluate their competencies with respect to both collecting, searching, selecting, and elaborating information, and transforming it into new information and useful knowledge indispensable in the decision-making process. On the other hand, Kamińska-Czubala devotes little space to the issues of personal information management and information structuration, which would cast light on the methods of knowledge internaliza-

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tion in the examined environment. Therefore this paper not only presents students' opinions on their level of preparation to efficient functioning in the world of information; their judgments are further tested by analysing the results they obtained while solving practical tasks. Frequently, those results did not confirm the high self-evaluation in a given area of competence. Neither did they significantly influence the sense of self-efficacy; it was revealed in conversations with the respondents, conducted after their practical assignments had been completed and evaluated.

Information competencies in personal knowledge and information management

Information competencies are often analysed from the perspective of skills, possessed by an individual, that guarantee access to relevant information. They are related to such activities as: preparing an individual to take actions that would make them aware of an information gap; specifying the information need, and identifying the sources necessary to satisfy it; and, in the next step, searching, selecting, collecting, and classifying the obtained records, i.e. managing data, facts, documents, etc. In some models of developing information competencies, such actions are included in library competencies, as opposed to technological competencies, which are aimed at decision making based on processed data (Batorowska, 2009, p. 43) and information use for specific purposes. In the latter perspective, the crucial aspect is the process of creating knowledge structures, transforming recorded information into new-value information, which requires good skills in analysis, synthesis, generalization, abstraction, deduction, and interdisciplinary reflection. Both these perspectives on competencies are complementary. They enable managing knowledge and information in an individualized manner, adequately to one's needs, intellectual capabilities, method and tempo of work, and preferred techniques and methods of perception.

Personal knowledge and information management requires not only the above-mentioned competencies, but also the awareness of information culture, which facilitates situating one's information behaviours in the context of current values and attitudes supporting one's own development. How well we are trained in knowledge and information management (K&IM) determines the development of our personality, the ways of pursuing success, and the methods of achieving it (Batorowska, 2015b, p.174).

Personal Information Management is defined as referring to "the practice and the study of the activities people perform to acquire, organize, maintain, retrieve, use and control the distribution of information items (...) for everyday use and to complete tasks (work-related or not) and to fulfil a person's various roles" (Jones, Teevan, eds., 2007, p. 3; Sapa, 2016). Skilful and efficient retrieval of a previously found, searched for, or created information

item in the form of a printed document, e-mail, handwritten notes, hyperlink collection, WWW content catalogue, book contents, abstracts, summaries, factographic lists, bibliographies, etc., requires forming one's own idea of knowledge management and being consistent in systematic development of one's personal information collection (Świgoń, 2012, s. 196). Creating such a collection is not possible without information competencies, like creating new knowledge is not possible without efficient management of one's personal information resources (Materska, 2012).

It is because new knowledge is also created as a result of organizing already stored information, and noticing associations and discovering links between stored pieces of information. Without information competencies, it is difficult to form external knowledge structures, which, as Mariusz Kąkolewicz emphasizes, "serve to extend internal structures: to memorize, consciously organize, and expand internalized knowledge" (Kąkolewicz, 2002, p. 186). His concept of learning through creating External Structures of Knowledge (ESK), whose purpose is to support learning in the era of information society, refers to the concepts of information literacy by Ch. S. Bruce and Ch. S. Doyle, in which information skills are connected with the realization of the information process (collecting, searching, selecting, processing, organizing, storing, presenting, sharing, and utilizing information). These skills facilitate learning mainly through developing personal strategies of K&IM. In the ESK concept, Kąkolewicz combines classical learning techniques with the possibilities offered by modern information and communication technology, stressing the importance of the ability to create notes and include them in the existing structure through creating links, to add new links to existing notes, and to transform them, taking into account various aspects (Kąkolewicz, 2002, pp.189–190). From the assumption about the great importance of developing external knowledge structures in the process of knowledge internalization stems the postulate addressed at teachers. Kąkolewicz suggests that their main task should be training young people in note editing, data structuring with the use of recent IT tools and techniques, and all other activities related to obtaining information and managing information resources.

Over almost fifteen years since that publication, we witnessed a revolution, e.g. in the teaching process being supported by ICT. We saw the introduction of new concepts and teaching methods, adapted to the digital environment, and a dynamic growth of IT infrastructure, yet problems with personal K&IM still constitute the weak link in the education of the young generation. Development of one's own data storage, organization and ranking systems, which would best match one's individual knowledge structures, should be fostered by training in e.g. mind-mapping, knowledge quantification, or creating analytical reports and information synthesis. The significance of content quantification technique and its use in realizing cognitive and practical

tasks is discussed in a series of articles by Adam Wojewódzki and Tadeusz Wojewódzki. The researchers note the value of a quantum of knowledge as a result of intellectual work, which allows them to construct a practical template for information recording (Wojewódzki, Wojewódzki, 2015, pp. 353-356). The quantum is tagged for the problem that initiated the information search; it contains a quote crucial to understand the problem (Wojewódzki, 2014, pp. 423-426), and associations with the quote and with the problem to be solved. Preparing such tags requires that the author of the quantum, apart from being intelligent, should possess specialist information competencies, mainly in analysis and synthesis. Creating a knowledge quantum is similar to working on analytical documents, the so-called "information bricks"; their construction and creation technique is presented by Krzysztof Liedel (Liedel, Piasecka, Aleksandrowicz, 2012, pp. 94-99). Messages of this kind are created basing on the model of "reversed triangle"; in each paragraph the authors must concentrate on the most important content first, and then conclude the paragraph with secondary information. Creating two-paragraph analyses, multi-thread analyses, quanta of knowledge, or record cards facilitates building the tree of knowledge. Students usually build the tree basing on the knowledge structures visualized as mind-maps and info-graphics. Other, more formally specified and refined forms, e.g. based on organization schemes, hierarchies, and faceted structures, are not so popular, due to the requirement to follow strict rules of grammar and controlled vocabulary, compulsory in indexing languages (Batorowska, 2015a, p. 20; Batorowska, 2016).

Research methodology

The present article presents the results of a research study on the perceived self-efficacy in working on and processing information collected by students, and including it in one's own knowledge structures. The research tool, designed for this purpose, was a survey questionnaire. It contained 42 statements of the type "I am convinced that I can..." The questions were supposed to help recreate the impressions that the respondents had while solving tasks in real problematic situations. The statements concerned seven areas of information competencies connected with: dividing a set into elements according to given criteria; labelling and naming sets of elements; assigning elements to a set; content synthesis in the form of conclusions, inferences, generalizations, etc.; creating knowledge structures (mind-maps, hierarchies, etc.); developing informative documents (publications, communiques) that require analytical-synthetic skills; searching for and selecting information. In each of the seven groups of competencies there were statements referring to specific competencies. Statements were coupled with a 6-degree scale of frequency: 1 – I almost never can, 2 – I usually cannot, 3 – I often cannot, 4 – I often

can, 5 – I usually can, 6 – I almost always can. In the questionnaire, the statements were presented in a random order, which allowed the surveyor to notice a potential lack of consistence in the respondents' choices and in their evaluation of their competencies in specific areas.

The research was conducted at the end of the academic year 2015/2016 among 186 students of the Jagiellonian University and the Pedagogical University of Cracow, enrolled in the Faculty of Management and Social Communication, Pedagogy, and Philology. All students were prepared to understand the questionnaire statements correctly: it was concluded judging from their specialization (information architecture, scientific information and library science), or from the subjects covered in the courses they were attending at the time of the survey (methodology of scientific work, diploma paper writing, information technology with elements of information literacy).

The respondents marked their perceived efficacy on the 6-point scale for each mentioned activity; for each respondent it was possible to obtain 252 points in 42 statements. While evaluating the degree of respondents' perceived self-efficacy in the mentioned activities, the total of all points that a statement could obtain was taken into consideration: maximum 1116 points. The percentage distribution revealed that the respondents differed in the level of information competencies in specific areas. Three levels were identified: elementary, intermediate, and advanced. It was assumed that the elementary level is characteristic of those persons whose sense of self-efficacy in a given specific area was the highest, i.e. persons who most often marked 6 and 5 on the scale; the intermediate level is characteristic of persons whose most frequent choice was 4; the advanced level was associated with the most frequent choice of 1, 2, or 3.

In the research, the highest number of points given by the respondents to one statement was 889 (out of the possible 1116 points); the lowest number was 658. Since the difference between the highest and lowest number of points given to one statement was 231, it could be assumed that the limit numbers of particular levels of competency should be separated by 77 points. However, a different assumption was preferred: if a statement on a given activity gained more than 76% of all available points, then it must be concluded performing this activity was associated with a conviction of possessing commonly shared abilities in a degree sufficing to perform the activity. In such a case, the declared level of respondents' competence in a specific area was marked as elementary. The intermediate level was related to a statement gaining 70% to 75% of the maximum available number of points, and the advanced level - less than 70% of the maximum number.

None of the 42 statements described a competence that turn out to be elementary for the whole research sample, although the range 70.1% - 79.7% of the maximum number of points for the statements evaluated at the elementary and intermediate level of efficacy is a good result, indicating a high

level of the declared information competencies (Table 1). To compare, in the study conducted by Kamińska-Czubala as many as 95% of the respondents evaluated their skills in manoeuvring in the information environment very highly (Kamińska-Czubala, 2016, p. 71). However, the set of statements evaluated in that research referred to information activities in everyday life, related e.g. to e-mail, e-commerce, communicators, and multimedia, and not to complicated procedures associated with data structuration, information, knowledge, multi-thread, interdisciplinary reflection on information obtained from different sources, or skills in elaborating data. For instance, in the research presented in this paper, only 27.4% of the respondents concluded that their sense of efficacy in activities aimed at creating structured notes, e.g. a bullet-point list, a compilation, a table, a graph, an organizational scheme, or a semantic map is the highest, and evaluated this skill the highest on the scale, with 6 points (Table 4). That was the highest index obtained in a specific area of competence. This same activity was assigned 5 points ("I usually can") by 33.3% of the respondents, while 30.1% of the students surveyed marked it with the comment "I often can".

Sense of self-efficacy in personal knowledge and information management

The tables included below illustrate in detail the areas of competence in which the respondents feel secure or insecure. The tables list the specific tasks which were judged by the respondents as easy or complicated. The division was carried out according to the ranking list created from the questionnaire data, where the respondents assigned points to particular statements. The ranking list was divided into sets of statements which obtained 6, 5, and 4 points on the survey scale, and one more set including all statements that received 1, 2, or 3 points. On the basis of the number of points assigned, each specific competence was classified into one of the three groups: elementary, intermediate, or advanced. Tables 1 and 2 present the research results according to the seven main areas of competence that were asked about in the survey. Tables 3, 4, and 5 present the results sorted by the number of respondents who evaluated their efficacy in the specific area in a given way. In order to preserve clarity and avoid repetition of already presented data, the tables include extreme frequencies of judgments, where the described activities were: the most difficult for the respondents (marked on the scale as 1, 2, or 3); not difficult at all (marked as 6); or satisfactory (marked 4 or 5).

Tables 1-4 also include tags for the specific areas of competence: a Roman numeral which denotes one of the seven main areas, another number marking the statement within the main area, and the number the statement received in the questionnaire. The last number helps to find data referring to one statement.

Table 1. Ranking of statements (within each main area of competence) according to the number of points awarded by the respondents evaluating their sense of self-efficacy in K&IM

Main area of competence	Tags for the specific areas of competence	Respondents' statements (I know I can:)	Number of points awarded to the statement by the respondents		Level of respondents' competence in a specific area
			The sum of points awarded to a statement by all respondents: in numbers	The sum of points awarded to a statement by all respondents: percentage	
I. Dividing a set into elements according to given criteria	I		IVa	IVb	V
	II	III			
	I.1/1	notice shared characteristics of the set elements	871	78.0	elementary
	I.2/38	categorize objects (notice similarities in diversity)	838	75.1	intermediate
	I.3/35	notice analogy between elements	840	75.3	intermediate
	I.4/27	list specific terms narrowing the main subject	811	72.7	intermediate
	I.5/3	identify the criteria for the set division (into subsets, classes, facets, etc.)	774	69.4	advanced
	I.6/4	notice various contexts of the subject of analysis (and name them)	752	67.4	advanced

I	II	III	IVa	IVb	V
II. Labelling/ naming sets/ elements	II.1/24	notice the inadequacy of the title (header) to the content	875	78.4	elementary
	II.2/11	choose key words to reflect the essential content of the document	864	77.4	elementary
	II.4/6	Give titles to subsets of the main set	857	76.8	elementary
	II.5/7	define names of header fields in tables presenting results of my own research	848	76.0	elementary
	II.3/30	give correct names to multi-element subsets (label the subsets)	791	70.9	intermediate
	II.6/4	notice various contexts of the subject of analysis and name them	752	67.4	advanced
III. Assigning elements to a set	III.1/5	assign elements to a defined set	870	78.0	elementary
	III.2/14	generalize issues discussed in the texts I read	863	77.3	elementary
	III.3/2	Identify the area of knowledge (field, discipline, specialization) to which the analysed problem belongs	846	75.8	intermediate
	III.4/21	abstract (ignore irrelevant or insignificant information)	839	75.2	intermediate
	III.5/31	perceive the problem interdisciplinarily	782	70.1	intermediate

I	II	III	IVa	IVb	V
IV. Synthesis of the content in the form of conclusions, deductions, generaliza- tions, etc.	IV.1/13	make notes in the form of bullet-point lists, compilations, tables, schemes, mind-maps, and other knowledge structures	889	79.7	elementary
	IV.2/17	concisely present a problem, an issue, a subject, etc.	845	75.7	intermediate
	IV.3/20	formulate deductions	828	74.2	intermediate
	IV.4/16	precisely formulate conclusions	826	74.0	intermediate
	IV.5/34	unequivocally and comprehensively characterize a given object (providing its features and their values)	796	71.3	intermediate
	IV.6/15	synthetically present the content of various documents	792	71.0	intermediate
	IV.7/33	describe an object using a specified number of signs (a fixed size text)	777	69.6	advanced
	IV.8/32	describe an object using factographic information	733	65.7	advanced
	V.1/28	create a mind-map	868	77.8	elementary
	V.2/26	establish relations between set elements	818	73.3	intermediate
V. Creating knowledge structures (mind-maps, hierarchies, etc.)	V.3/25	create organizational schemes (hierarchies)	816	73.1	intermediate
	V.4/23	create semantic links between terms and concepts	772	69.2	advanced
	V.5/40	while describing an object in the form of an organizational scheme using key terms, assign the terms to the appropriate level of hierarchy	795	68.0	advanced
	V.6/19	use cross-reference to connect related terms in indexes	736	65.1	advanced

I	II	III	IVa	IVb	V
VI. Creating informative documents (publications, communi- ques) that require analytical/ synthetic skills	VI.1/37	create a correct structure of the contents for the elaborated subject	820	73.5	intermediate
	VI.2/29	design a scientific poster or infographics	820	73.5	intermediate
	VI.3/39	summarize scientific texts	813	72.9	intermediate
	VI.4/8	create abstracts (analyses or summaries presenting the subject and aim of the work, its main issues, methodology, etc.)	805	72.1	intermediate
	VI.5/9	create annotations supplementing the description of the missing elements or clarifying the unspecific fragments of the content (subject)	761	68.2	advanced
	VI.6/18	create indexes (of subjects, sections, terms and concepts, etc.)	731	65.5	advanced
	VI.7/41	develop quanta of knowledge (record cards)	721	64.6	advanced
	VI.8/42	develop analytical reports (communiques)	658	59.0	advanced
	VII.1/22	differentiate between significant (key) words and insignificant ones	874	78.3	elementary
	VII.2/12	specify queries (searches) using key words	862	77.2	elementary
VII. Search for and selection of information	VII.3/10	separate new information from known, redundant, information, which is unnecessary for the comprehension of the new information	843	75.5	intermediate
	VII.4/36	while searching for subject literature in electronic catalogues, formulate a complex query	771	69.1	advanced

Source: own study

Table 2. Ranking list of statements according to the total number of points assigned by the respondents evaluating their sense of self-efficacy in K&IM, divided into sets of statements that received 6, 5, 4, and 1-3 points on the scale, sorted by main areas of competence

Specific area of competence	Respondents' statements (I know I can:)	Number of points awarded to the statements by the respondents, according to the marks on the scale			
		I almost always can (number of points from mark 6 on the scale)	I usually can (number of points from mark 5 on the scale)	I often can (number of points from mark 4 on the scale)	I often / usually cannot, I never can (number of points from marks 1-3 on the scale)
I	II	IIIa	IIIb	IIIc	IIId
I. Dividing a set into elements according to given criteria					
I.1/1	notice shared characteristics of the set elements	258	330	244	59
I.2/38	categorize objects (notice similarities in diversity)	174	320	276	66
I.3/35	notice analogy between elements	180	340	248	72
I.4/27	list specific terms narrowing the main subject	102	335	284	90
I.5/3	identify the criteria for the set division (into subsets, classes, facets, etc.)	96	300	252	126
I.6/4	notice various contexts of the subject of analysis and name them	66	220	324	142
II. Labelling / naming sets / elements					
II.1/24	notice the inadequacy of the title (header) to the content	234	355	244	42

I	II	IIIa	IIIb	IIIc	IIId
II.2/11	choose key words to reflect the essential content of the document	222	365	216	61
II.4/6	Give titles to subsets of the main set	186	385	216	70
II.5/7	define names of header fields in tables presenting results of my own research	240	290	244	74
II.3/30	give correct names to multi-element subsets (label the subsets)	144	265	260	122
II.6/4	notice various contexts of the subject of analysis and name them	66	220	324	142
III. Assigning elements to a set					
III.1/5	assign elements to a defined set	198	380	248	44
III.2/14	generalize issues discussed in the texts I read	168	330	292	55
III.3/2	Identify the area of knowledge (field, discipline, specialization) to which the analysed problem belongs	132	400	260	54
III.4/21	abstract (ignore irrelevant or insignificant information)	192	320	236	91
III.5/31	perceive the problem interdisciplinarily	126	265	252	139
IV. Synthesis of the content in the form of conclusions, deductions, generalizations, etc.					
IV.1/13	make notes in the form of bullet-point lists, compilations, tables, schemes, mind-maps, and other knowledge structures	306	310	224	50
IV.2/17	concisely present a problem, an issue, a subject, etc.	186	340	248	71
IV.3/20	formulate deductions	156	270	244	128
IV.4/16	precisely formulate conclusions	150	320	284	72

I	II	IIIa	IIIb	IIIc	IIId
IV.5/34	unequivocally and comprehensively characterize a given object (providing its features and their values)	120	260	324	93
IV.6/15	synthetically present the content of various documents	150	225	304	113
IV.7/33	describe an object using a specified number of signs (a fixed size text)	108	285	240	144
IV.8/32	describe an object using factographic information	90	215	280	148
V. Creating knowledge structures (mind-maps, hierarchies, etc.)					
V.1/28	create a mind-map	270	340	192	66
V.2/26	establish relations between set elements	162	310	244	102
V.3/25	create organizational schemes (hierarchies)	180	255	272	109
V.4/23	create semantic links between terms and concepts	102	250	276	144
V.5/40	while describing an object in the form of an organizational scheme using key terms, assign the terms to the appropriate level of hierarchy	78	215	332	134
V.6/19	use cross-reference to connect related terms in indexes	102	185	260	179
VI. Creating informative documents (publications, communiques) that require analytical/synthetic skills					
VI.1/37	create a correct structure of the contents for the elaborated subject	186	270	264	100
VI.2/29	design a scientific poster or infographics	288	245	164	123
VI.3/39	summarize scientific texts	138	340	232	103
VI.4/8	create abstracts (analyses or summaries presenting the subject and aim of the work, its main issues, methodology, etc.)	132	275	308	90

I	II	IIIa	IIIb	IIIc	IIId
VI.5/9	create annotations supplementing the description of the missing elements or clarifying the unspecific fragments of the content (subject)	66	270	288	137
VI.6/18	create indexes (of subjects, sections, terms and concepts, etc.)	114	165	288	164
VI.7/41	develop quanta of knowledge (record cards)	96	210	236	179
VI.8/42	develop analytical reports (communiques)	60	130	244	224
VII. Search for and selection of information					
VII.1/22	differentiate between significant (key) words and insignificant ones	228	375	224	47
VII.2/12	specify queries (searches) using key words	210	380	212	60
VII.3/10	separate new information from known, redundant, information, which is unnecessary for the comprehension of the new information	192	335	232	84
VII.4/36	while searching for subject literature in electronic catalogues, formulate a complex query	144	210	288	129

Source: own study

Table 3. Extreme frequencies of statements on self-efficacy in K&IM, describing activities that the respondents found most difficult (marked 1-3 on the scale), sorted by the number of respondents

Most and least frequent difficulties	Statements concerning activities that cause problems to the respondents most often and least often	Number of respondents evaluating the statement		Specific area of competence	Points assigned by the respondents to the statement: 1 often/usually cannot, I never can (1-3 on the scale)
		In numbers	In percentage		
I	II	IIIa	IIIb	IV	V
I. Statements describing activities that cause difficulties to the greatest number of respondents	develop analytical reports (communiques)	89	47.8	VI.8/42	224
	develop quanta of knowledge (record cards)	69	37.1	VI.7/41	179
	use cross-reference to connect related terms in indexes	68	36.6	V.6/19	179
	create indexes (of subjects, sections, terms and concepts, etc.)	62	33.3	VI.6/18	164
	describe an object using factographic information	58	31.2	IV.8/32	148
	describe an object using a specified number of signs (a fixed size text)	51	27.4	IV.7/33	144
	create semantic links between terms and concepts	50	26.9	V.4/23	144
	notice various contexts of the subject of analysis and name them	50	26.9	I.6/4	142
	create annotations supplementing the description of the missing elements or clarifying the unspecified fragments of the content (subject)		26.9	VI.5/9	137
	perceive a problem interdisciplinary	49	26.3	III.5/31	139
	while describing an object in the form of an organizational scheme using key terms, assign the terms to the appropriate level of hierarchy	48	25.9	V.5/40	134

I	II	IIIa	IIIb	IV	V
II. Statements describing activities that cause difficulties to the least number of respondents	Give titles to subsets of the main set	24	12.9	II.4/6	70
	categorize objects (notice similarities in diversity)	24	12.9	I.2/38	66
	choose key words to reflect the essential content of the document	22	11.8	II.2/11	61
	specify queries (searches) using key words	22	11.8	VII.2/12	60
	notice shared characteristics of the set elements	21	11.3	I.1/1	59
	generalize issues discussed in the texts I read	19	10.2	III.2/14	55
	Identify the area of knowledge (field, discipline, specialization) to which the analysed problem belongs	19	10.2	III.3/2	54
	make notes in the form of bullet-point lists, compilations, tables, schemes, mind-maps, and other knowledge structures	17	9.1	IV.1/13	50
	differentiate between significant (key) words and insignificant ones	17	9.1	VII.1/22	47
	assign elements to a defined set	15	8.1	III.1/5	44
	notice the inadequacy of the title (header) to the content	15	8.1	II.1/24	42

Source: own study

Table 4. Extreme frequencies of statements on self-efficacy in K&IM, describing activities that the respondents found least difficult (marked 6 on the scale), sorted by the number of respondents

Activities most and least often mentioned as easy by the respondents	Main area of competence	Statements describing activities that the respondents found easy (I know I can)	Number of respondents evaluating the statement			Points assigned by the respondents to the statement: I often/usually cannot, I never can (1-3 on the scale)
			In numbers	In percentage		
I	II	III	IVa	IVb	V	
I. Statements that mention activities found easy by the greatest number of respondents	IV.1/ 13	make notes in the form of bullet-point lists, compilations, tables, schemes, mind-maps, and other knowledge structures	51	27.4		306
	VI.2/29	design a scientific poster or infographic	48	25.8		288
	V.1/28	create a mind-map	45	24.2		270
	I.1/ 1	notice shared characteristics of the set element	43	23.1		258
	II.5/7	define names of header fields in tables presenting results of my own research	40	21.5		240
	II.1/24	notice the inadequacy of the title (header) to the content	39	21.0		234
	VII.1/22	differentiate between significant (key) words and insignificant ones	38	20.4		228
	II.2/ 11	choose key words to reflect the essential content of the document	37	19.9		222
	VII.2/12	specify queries (searches) using key words	35	18.8		210

I	II	III	IVa	IVb	V
II. State- ments that mention activities found easy by the least number of respondents	VI.8/42	develop analytical reports (communiques)	10	5.4	60
	I.6/4	notice various contexts of the subject of analysis (and name them)	11	5.9	66
	VI.5/9	create annotations supplementing the description of the missing elements or clarifying the unspecific fragments of the content (subject)	11	5.9	66
	V.5/40	while describing an object in the form of an organizational scheme using key terms, assign the terms to the appropriate level of hierarchy	13	7.0	78
	IV.8/32	describe an object using factographic information	15	8.1	90
	I.5/3	identify the criteria for the set division (into subsets, classes, facets, etc.)	16	8.6	96
	V.4/23	create semantic links between terms and concepts	17	9.1	102
	V.6/19	use cross-reference to connect related terms in indexes	17	9.1	102

Source: own study

Table 5. Extreme frequencies of statements on self-efficacy in K&IM describing activities in which the respondents feel competent at a satisfactory level (marked 4 and 5 on the scale), sorted by the number of respondents

Most and least frequent statements	Statements that mention activities in which the respondents feel competent in a satisfactory degree	Number of respondents evaluating their efficacy in the activity mentioned, describing it as:			
		I usually can (mark 5)		I often can (mark 4)	
		Statement "a"		Statement "b"	
		In numbers	In percentage	In numbers	In percentage
I	II	IIIa1	IIIa2	IIIb1	IIIb2
Statements describing activities in which the respondents MOST OFTEN feel competent in a satisfactory degree	a. Identify the area of knowledge (field, discipline, specialization) to which the analysed problem belongs	80	43.0	83	44.6
	b. while describing an object in the form of an organizational scheme using certain terms, assign the terms to the appropriate level of the hierarchy				
	a. Give titles to subsets of the main set	77	41.4	81	43.5
	b. notice various contexts of the subject of analysis (and name them)				
	a. assign elements to a defined set	76	40.9	81	43.5
	b. unequivocally and comprehensively characterize a given object (providing its features and their values)				
	a. specify queries (searches) using key words	76	40.9	77	41.4
	b. create abstracts (analyses or summaries presenting the subject and aim of the work, its main issues, methodology, etc.)				

I	II	IIIa 1	IIIa 2	IIIb 1	IIIb 2
I cont. Statements describing activities in which the respondents MOST OFTEN feel competent in a satisfactory degree	a. differentiate between significant (key) words and insignificant ones	75	40.3	76	40.9
	b. synthetically present the content of various documents				
	a. choose key words to reflect the essential content of the document	73	39.2	73	39.2
	b. generalize issues discussed in the texts I read				
	a. notice the inadequacy of the title (header) to the content	71	38.2	72	38.7
	b. while searching for subject literature in electronic catalogues, formulate a complex query				
	a. concisely present a problem, an issue, a subject, etc.				
	b. create annotations supplementing the description of the missing elements or clarifying the unspecific fragments of the content (subject)	68	36.6	72	38.7
	a. separate new information from known, redundant information, which is unnecessary for the comprehension of the new information				
	b. create indexes (of subjects, sections, terms and concepts, etc.)	67	36.0	72	38.7
Statements describing activities in which the respondents LEAST OFTEN feel competent in a satisfactory degree	a. develop analytical reports (communiques)	26	14.0	41	22.0
	b. design a scientific poster or infographics				
	a. create indexes (of subjects, sections, terms and concepts, etc.)	33	17.7	48	25.8
	b. create a mind-map				

I	II	IIIa1	IIIa2	IIIb1	IIIb2
cont. Statements describing activities in which the respondents LEAST OFTEN feel competent in a satisfactory degree	a. use cross-reference to connect related terms in indexes	37	19.9	53	28.5
	b. specify queries (searches) using key words				
	a. while searching for subject literature in electronic library catalogues, formulate a complex query	42	22.6	54	29.0
	b. give titles to subsets of the main set				
	a. describe an object using factographic information				
	b. choose key words to reflect the essential content of the document	43	23.1	54	29.0
	a. notice various contexts of the subject of analysis (and name them)	44	23.7	56	30.1
	b. notice shared characteristics of the set elements				
	a. synthetically present the content of various documents				
	b. make notes in the form of bullet-point lists, compilations, tables, schemes, mind-maps, and other knowledge structures	45	24.2	56	30.1
	a. design a scientific poster or infographics				
	b. differentiate between significant (key) words and insignificant ones	49	26.3	56	30.1

Source: own study

The sense of self-efficacy in performing the activities listed in Table 1 within the seven main areas of competence was evaluated diversely by the respondents. Judging by the points awarded to particular statements by the students surveyed, it can be concluded that the area in which they see their efficacy as the highest is the second area, related to skills in "labelling sets isolated from a larger set". In this area as many as four tasks were considered elementary (easy), and one task was regarded as slightly more difficult, as it required naming correctly multiple-element subsets, (although it is not always easy to account for the content of all these elements in the superordinate term chosen as the subset title). Also in the third main area, i.e. "assigning elements to a set", most tasks did not seem problematic to the respondents. It was found that they associated two tasks in this area with elementary competencies, three tasks – with intermediate competencies, and considered none of the tasks to be difficult. The respondents expressed most doubts concerning their efficacy in area six, related to "creating various forms of publications that require analytical/synthetic skills" and to the knowledge of their structure, be it a record card, knowledge quantum, annotation, summary, abstract, contents, infographics, scientific poster, or a more complex form, like an analytical report or information synthesis. Also area five raised many doubts as to the satisfactory level of self-efficacy, as this area included tasks that required skills in "knowledge structuration". Greatest problems were associated with the tasks that involved creation of semantic links between terms and concepts, description of a subject in the form of an organizational scheme using key terms and correct assignment of the terms to the given level in the hierarchy, and connection of related terms in indexes, using cross-reference. A confirmation of the respondents' high efficacy in the activities mentioned in particular main areas can be the average number of points per one statement within each main area. The highest mean number of points per one statement, 840, was assigned in section III, next – 837 – in section VII, then 831 in section II, 814 in section I, 810 in section IV, 800 in section V, and the lowest number, 766 points, in section VI.

Table 2 sets together data that allow comparing the sense of self-efficacy in K&IM, taking into account the division into statements marked 6, 5, 4, and 1-3. The highest number of points (over 300 out of 1116) was assigned to statements marked 5 on the scale, which corresponds to the self-evaluation "I usually can" efficiently perform the task; what is more, that was the case in all seven main areas of competence. As for the statements marked 1-3 on the scale, the highest number of points (over 100 out of 1116) was assigned to statements in only two areas, i.e. area five (creating knowledge structures) and area six (creating informative documents that require analytical/synthetic skills). Despite the fact that the

respondents very highly evaluated their efficacy in K&IM, in some tasks that required specific competencies they remained wary about the possibility of achieving complete satisfaction. It can be illustrated by the statements that received less than 100 points in total but were marked 6 on the scale, e.g. "I know I can": notice various contexts of the subject of analysis (and name them); while describing an object in the form of an organizational scheme using key terms, assign the terms to the appropriate level of hierarchy; create annotations supplementing the description of the missing elements or clarifying the unspecific fragments of the content (subject); develop analytical reports (communiques).

Tables 3, 4, and 5 refer to the sense of self-efficacy in K&IM in the context of the number of respondents who evaluated their competences facilitating performance of the described task. Among the statements about the activities that cause problems to the greatest number of respondents we must mention: writing analytical documents (communiques, reports) (47.8%) and creating quanta of knowledge (37.1%). The least respondents – a mere 8.1% - reported difficulties in assigning elements to a defined set and noticing the inadequacy of the title (header) to the content of the document, paragraph, section, etc. Also a mere 9.1% of the respondents found it difficult to differentiate between significant (key) words and insignificant ones and to make notes in the form of bullet-point lists, compilations, tables, schemes, mind-maps, and other knowledge structures (Table 3).

Not only creating structured notes turned out to be easy for most respondents. 25.8% of respondents found it easy to design scientific posters and infographics, and 24.2% found it easy to create mind-maps. On the other hand, only a small percentage of the students surveyed (5.4%-8.1%) considered it easy: to notice various contexts of the subject of analysis and name them; to create annotations supplementing the description of the missing elements or clarifying the unspecific fragments of the content (subject); and to describe an object in the form of an organisational scheme or factographic information (Table 4).

The activities in which the respondents most often feel satisfactorily efficient are: identifying the area of knowledge (field, discipline, specialization) to which the analysed problem belongs, and describing an object in the form of an organizational scheme using key terms and assigning these terms to the appropriate level of hierarchy. The students surveyed declared the least satisfaction with their efficacy in developing analytical reports (Table 5). For example, 47.8% of the respondents believed that they were not efficient in this activity, and only 5.4% of them claimed to have mastered the skill completely (mark 6). In turn, 14% of the respondents stated that they "usually can" produce such documents, and 32.8% - that they "often can" do it. (Tables 3, 4, 5).

Students' actual level of training for personal knowledge and information management.

Data presented in the tables above illustrate a rather good opinion the respondents have on their self-efficacy in the examined areas of competence. 70% of the persons surveyed were further asked to perform additional tasks, aimed at testing their actual qualifications to solve information problems mentioned in particular questionnaire statements. 20% of the original group of respondents were assigned a task designed to reveal their competence in solving a research problem interdisciplinarily. The remaining 50% of the respondents were asked to complete a form containing four exercise tasks. In the first one, a set of terms concerning information society was to be divided into subsets according to a criterion; then the subsets were to be named (labelling subsets). In the second task, an organizational scheme (a classification tree) was to be created for the term "information society", using all the terms mentioned in task one. In the third task, the respondents were to provide a term (key word or key phrase) covering the semantic scopes of all the words listed in the task; they were asked to think of an association all the terms evoke and to express it in one umbrella term. The last task consisted in creating a title for a document on the basis of its contents only; the title needed to be suitable to the content. The respondents were also asked to correct the suggested title, if they considered it inadequate to the thematic scope of the document.

Table 6 below puts together respondents' statements that were selected to be verified in this control follow-up test. The actual level of competence in a specific area was established on the basis of the grade awarded to the respondent in the test. For a correctly performed task, from 0.5 to 1.5 points could be awarded. 0.5 point denoted competences at a satisfactory level (grade DST - satisfactory); 1 point – intermediate level (grade DB – good), and 1.5 points – advanced level (grade BDB – very good). The set of students participating in this test constituted 50% of the original sample of respondents, who belonged to four different didactic groups (93 persons in total). The maximum number of points for all tasks was 558. However, they scored only 208 points, which is a mere 37.3% of the total number of points. Most points were assigned to the respondents for task two (66.5), then for task one (52), task four (46) and task three (44).

A detailed analysis of the control tasks examining the actual K&IM qualifications of the respondents, and a comparison of these results with the perceived self-efficacy data will be presented in another paper, to be published in the "Edukacja-Technika-Informatyka" journal.

Table 6. Statements that were selected for verification in the control test

Main area of competence	Respondents' statements' (I know I can:) examined in the control test	Efficacy in the given area, calculated as a ratio of the points the given statement scored to the maximum number of points to be scored by any statement: In percentage	Level of respondents' competence in the specific area, identified with the sense of self-efficacy in this area	Number of the task in the control test, corresponding to the competence area mentioned in the self-efficacy questionnaire	Level of competence in a specific area, established on the basis of the grade obtained in the control task testing this area of competence
I	II	III	IV	V	VI
I. Dividing a set into elements according to given criteria	notice shared characteristics of the set element	78.0	elementary (very good)	Task 1	good
	categorize objects (notice similarities in diversity)	75.1	intermediate (good)	Task 1	good
	identify the criteria for the set division (into subsets, classes, facets, etc.)	69.4	advanced (satisfactory)	Task 1	satisfactory
II. Labelling/ naming sets / elements	notice the inadequacy of the title (header) to the content	78.4	elementary (very good)	Task 4	good
	Give titles to subsets of the main set	76.8	elementary (very good)	Task 1	satisfactory
	give correct names to multi-element subsets (label the subsets)	70.9	intermediate (good)	Task 3	satisfactory

I	II	III	IV	V	VI
III. Assigning elements to a set	assign elements to a defined set	78.0	elementary (very good)	Task 2	satisfactory
	generalize issues discussed in the texts I read	77.3	elementary (very good)	Task 3	satisfactory
	identify the area of knowledge (field, discipline, specialization) to which the analysed problem belongs	75.8	intermediate (good)	Task 3	satisfactory
	create organizational schemes (hierarchies)	73.1	intermediate (good)	Task 2	satisfactory
V. Creating knowledge structures (mind-maps, hierarchies, etc.)	while describing an object in the form of an organizational scheme using certain terms, assign the terms to the appropriate level of the hierarchy	68.0	advanced (very good)	Task 2	satisfactory

Source: own study

Conclusions

The respondents highly evaluated their self-efficacy in K&IM. The tasks testing the declared level of efficacy verified the positive self-evaluation only in some of the areas of competence, mainly those related to set division, information selection, and labelling. The respondents' good self-evaluation was not confirmed with respect to: assigning elements to a set, creating knowledge structures, giving titles to subsets of the main set, and naming multi-element subsets.

Difficulties in creating logical knowledge structures most often resulted from: the lack of detailed knowledge on the analysed subject (in the research it was the information society); a superficial and monoaspectsual approach to the subject; using stereotypical opinions and colloquial expressions concerning the subject; the assumption that the subject is well-known and thus uncomplicated, and varied experience that the respondents gained in their informational environment.

Nevertheless, according to Bandura's theory, the sense of self-efficacy in performing tasks allows the respondents to defend their stance and look for justifications for the adopted solution. Unfortunately, they frequently do not notice the difference between the value of the adopted solution and the proposal to present the solution in a logical, formalized manner. It is a consequence of functioning in a world dominated by fragmentation, haste, superficiality, novelty, fluidity, and multitasking (Batorowska, 2015b, p. 170).

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Hanna Batorowska

Perceived self-efficacy vs. actual level of training in personal information and knowledge management. A research report

Abstract

The article presents the results of a study conducted among students of regular university courses in Humanities and Pedagogy, investigating their perceived self-efficacy in personal information and knowledge management, with a special focus on the methods of stored information resources processing. The respondents' self-efficacy reports, obtained by means of a questionnaire, were compared with their evaluation by the researcher. The basis for the evaluation was a set of practical tasks, illustrating the activities listed in the survey questionnaire in the section *I know I can...*. Analysis of the results confirmed good self-evaluation only in selected areas of activity, e.g. in set division, information selection and information search. Students' efficacy was not confirmed in the areas of: forming knowledge structures, giving titles to main set subdivisions, and giving correct titles to multiple-element subsets.

Key words: personal knowledge and information management, sense of self-efficacy, information competencies, information culture, information behaviours, information processing, knowledge structure, information architecture, empirical research

Hanna Batorowska

Poczucie własnej skuteczności a rzeczywiste przygotowanie do indywidualnego zarządzania informacją i wiedzą. Raport z badań

Abstrakt

W artykule przedstawiono wyniki badań przeprowadzonych wśród studentów studiów stacjonarnych (humanistycznych i pedagogicznych) na temat postrzeganej przez nich własnej skuteczności w zakresie indywidualnego zarządzania informacją i wiedzą, ze szczególnym uwzględnieniem sposobów przetwarzania zgromadzonego zasobu informacyjnego. Porównano własną ocenę respondentów z oceną wystawioną im przez badającego na podstawie wykonanych zadań praktycznych będących egzemplifikacją działań, o które pytano w zestawie stwierdzeń typu: wiem, że potrafię, umieszczonych w kwestionariuszu badań ankietowych. Analiza danych potwierdziła dobrą samoocenę tylko w wybranych zakresach działań, na przykład dotyczących podziału zbioru na części, selekcji i wyszukiwania informacji. Nie potwierdziła natomiast ich skuteczności w zakresie tworzenia struktur wiedzy, nadawania tytułów działom, na które podzielono zbiór główny czy nadawania prawidłowych nazw działom składającym się z wielu elementów.

Słowa kluczowe: indywidualne zarządzanie informacją i wiedzą, poczucie własnej skuteczności, kompetencje informacyjne, kultura informacyjna, zachowania informacyjne, przetwarzanie informacji, strukturyzacja wiedzy, architektura informacji, badania empiryczne