dr Rafał Ireneusz Wawer
Maria Curie-Skłodowska University in Lublin
Faculty of Pedagogy and Psychology
Institute of Pedagogy
Department of Pedagogy of Culture

Summary of professional accomplishments

Contents

1. Given name and surname

Rafał Ireneusz Wawer

2. Diplomas awarded, scientific and artistic degrees including the name, place and year of obtaining, as well as the title of a doctoral dissertation

Master's Degree – Faculty of Management and Fundamentals of Technology; major: technical education, specialization: teaching; Lublin University of Technology, 1993; graduated with a very good result (Annex).

The degree of PhD in Humanities in Pedagogy conferred pursuant to a resolution of the Scientific Council of the Educational Research Institute, December 2006 (Annex). Supervisor: dr hab. Bogusław Szmygin, dissertation entitled: *The effectiveness of computer animation in vocational education* (Annex).

Postgraduate education – Protection of Intellectual Property. Project: "Educating academic staff in conducting lecturers on the subject of Protection of Intellectual Property" – the project implemented by the University of Maria Curie-Skłodowska in Lublin, Faculty of Biology and Biotechnology. Completed in 2012. The certificate No. 72 (Annex).

3. Information on employment in scientific/artistic units until the present

In 1999, having won a competition, I was employed as an assistant lecturer in the Laboratory of Audiovisual Teaching Aids, Faculty of Pedagogy and Psychology, Maria Curie-Skłodowska University in Lublin.

After obtaining a doctoral degree, from 2007 to the present, I work as an assistant professor in the Department of Pedagogy of Culture, Institute of Pedagogy, Faculty of Pedagogy and Psychology, Maria Curie-Skłodowska University in Lublin.

4. Indicated accomplishments as defined by Article 16 Clause 2 of the Act of March 14, 2003 on Scientific Degrees and Titles as well as Degrees and Titles in the Arts (Journal of Laws No. 65, item 595 with subsequent amendments)

My interests in media pedagogy are associated with my professional work and participation in projects implementing knowledge through multimedia materials introduced to schools of all levels.

As part of these activities, I actively participated in the EU programme "Multimedia Protection of National Heritage" (1998–2002). The aim of the project was to popularize knowledge about heritage conservation and introduce video materials to all secondary schools in Poland. Within the project, six films were realized: *Elbląg – a resurrected town* (1998), *Malbork – the common heritage* (first prize at the festival of scientific films in Kraków in 1999, the "Silver Owl" and a special prize of prof. Wiktor Zin and the European Academy of Fine Arts in Kraków, *Gdańsk – a rebuilt history* (2000), *Stutthof – a concentration camp* (2001), *Żuławy – the heritage of work* (2001), *The reconstruction of historical cities of northern and western Poland* (2002) (Annex).

At the same time, I co-managed the Media Building Education programme, entitled "Materials, products and modern construction technologies" under the aegis of the Ministry of Regional Development and Construction, and the Chamber of Construction Industry and Commerce. Within this project, 25 educational films were realized. All the films were distributed to 270 construction schools and 17 universities of technology in Poland (Annex).

Another co-managed project in the field of education was Media Education programme "Landscape formation awareness and the protection of historical landscape". The project and its implementation were awarded at the National Review of Ecological Publications for outstanding essential and ecological values.

The last prepared and co-managed project was the international project "Culture 2000". The title of the project was "The past in the present – to live in a historical city" (2004–2006). The project was of a research-educational character. It was aimed at the implementation of a number of long-term tasks, on a European scale: international exchange of the most valuable experiences related to the use and protection of historical cities, presentation and

popularization of historical cities, presentation of the history and contemporary life of historical cities in different countries and cultures, drawing the international attention to the need, opportunities and benefits related to the protection and use of historical cities, establishing of contacts between conservators and local governments of historical towns in particular countries, contacts which are based on the exchange of experiences, education of young people in terms of the contemporary use of the heritage of different cultures and nations. The project was prepared and submitted, however, it did not obtain funding from the European Commission.

4.1. Areas of scientific interest

The main area of my research is focused on the eye-tracking diagnosis combined with visual messages presented as: photography, film, disability, historical educational spaces, visual stimulation, the Internet, advertising. What is interesting to me in this respect is the possibility of optimizing messages by measuring, recording and analyzing data collected directly from information on the location and movements of the human eye. An important part of my research is the analysis of quantitative and qualitative objective data obtained directly from the occurrence of psychophysical and neuropsychiatric processes which accompany the activation and processing of visual information, especially in pedagogy.

The issue related to effective teaching and learning is an addition to the research activity. I am particularly interested in experimental studies that use modern information technologies. This area is explored by many researchers, but due to extensive, multidirectional development of informatization (also in education), it remains interesting as far as its exploration is concerned.

In connection with my technical education, I am also involved in research related to modern computer technology, including the education aided by computer simulations and new methods of image recording used in education.

4.2. Grounds for the opening of a habilitation procedure

The basis for the opening of a habilitation procedure is a study of implementation of eye-tracking studies in pedagogy. It covers two monographs:

- A self-prepared, combined study of the fourth chapter of a co-authored monograph – Janusz Kirenko and Rafał Ireneusz Wawer, *Distance vs. Tolerance. The Perception of Disability in Eye-Tracking Studies*. Lublin 2015, MCSU Press, pp. 367 (chapter pages: 179–319), reviewer: Prof. dr hab. Tadeusz Gałkowski.

- Rafał Ireneusz Wawer, *Knowledge and Its Relations to Visual Perception of a Human Being. Verification Diagnosis of the Students' Level of Knowledge of Savoir-Vivre in Eye-Tracking Studies*. Lublin 2018, MCSU Press, pp. 285, reviewer: Dr hab. Marta Wrońska.

4.3. Discussion of the scientific aim of the above mentioned paper and the obtained results, as well as a discussion of their possible use

The underlying premise of the monograph Knowledge and Its Relations to Visual Perception of a Human Being. Verification Diagnosis of the Students' Level of Knowledge of Savoir-Vivre in Eye-Tracking Studies involved theoretical and empirical explorations which have formed a basis for proposing interrelation statements and practical deliberations in the field of knowledge and how it is related to visual perception of a human being.

Establishing the existence of such relations opened the way for an attempt to verify the assumed working hypothesis according to which an individual's knowledge level affects the way he or she perceives reality. In order to verify this hypothesis, I chose a domain of knowledge pertaining to human behavior with respect to customs, social norms, and etiquette rules, commonly referred to as savoir-vivre (s-v).

In principle, the book refers to pedagogy and its main discipline – didactics. The research work covered visual perception, vision, and image analysis. Performing the task required of me to introduce other branch of science, psychology, on the grounds of which I conducted the necessary analysis.

Image analysis, as a method for answering research questions, currently in pedagogy or, more generally, in social studies, is still rarely applied. A careful study of images is accompanied by reflection on the ways through

which they depict highly specific visions of a variety of available social categories and forms of human activity in heterogeneous spheres of life. At this point, I would like to stress that what an image looks like is of secondary importance. How it is viewed – this aspect plays the central role. Questions of: How do we look at an image?; How do we describe what's in front of us?; What basis do we use to interpret it?, remain of fundamental importance.

The principal goal of this study is to determine and verify the relations between possessed knowledge and the manner of perception of s-v among students. It should be added that the content-related scope of the research only pertained to human customs, rules, and patterns of behavior covering the influence of European culture. This stipulation is important the more so that the rules embedded in the European culture circle (s-v) are not necessarily to be found in other cultural traditions. There are several reasons for which the s-v aspect was used as a starting point to engage in the exploration of the research material:

- thematic novelty in pedagogy,
- utilitarian aspect,
- cognitive curiosity declared by students,
- immediate availability,
- usefulness of such knowledge.

I have expressed the main research problem as a question: Are there, and if so, in what areas, relationships between the s-v knowledge of pedagogy students and their visual perception?
In order to approach a problem thus formulated, I set out to analyze the pedagogy students' introductory knowledge of s-v and performed the first measurement of visual perception among the respondents. Having introduced the training factor (a presentation), I repeated the measurement of students' knowledge of s-v and again measured their visual perception. In the study, I also took account of associations between selected socio-demographic variables such as social stratification, university major, and the year of studies, and the manner of visual perception prevalent among pedagogy students.
In the proposed research model, the first hypothesis to undergo empirical verification assumes that change in the pedagogy students' knowledge of s-v is associated with a change to the manner of their visual perception. I also proposed a second hypothesis assuming the existence of relationships between social stratification, university major, and the year of studies, on the one hand, and the manner of visual perception prevalent among pedagogy students, on the other hand.

It was not easy to address the background for the proposed hypotheses, because in the literature on the subject and, in particular, when performing queries in the field of experimental research, I did not come across any similar instances of exploration. It should be stressed that it was not my intention to clarify causal links being a basis for formulating a theory which could explain such links. Instead, I ventured to describe the associations existing between individual variables (cf. Kirenko, Wawer 2015, p. 48; cf. Oleś 1989; Kirenko, Zubrzycka-Maciąg 2014; Kirenko, Wiatrowska 2015). Research method I adopted for the purpose of assessing changes to the level of knowledge was pedagogical experiment. At the same time, to verify hypotheses concerning a description of links between the respective variables, I used two research techniques:

- didactic test – useful in the procedure of determining changes which occurred in the knowledge of s-v among the students as a result of educational activities;

- eye-tracking test – allows one to determine the actual level of individual visual perception, and, in consequence, reveal tendencies and relationship in the perception of specific areas *which correspond to or complement other areas.*

1. *Didactic test* – when working on an appropriate didactic test able to measure the students' knowledge of s-v, I was partly referring to a questionnaire survey by J. Stanek, applied to test correlations associated with the perception and application of s-v principles by the students when given instructions, and the related conditions (cf. Stanek 2011). In its full version, this tool offers 115 questions. I made a random selection of 36 questions, assigning 20 minutes for answering them. Reduction in the testing time resulted from H.R. Mills' research findings on the impact of attention span on cognitive abilities (cf. Mills 1977).

Before commencing the actual study, a (pilot stage) procedure was carried out in order to adapt selected test questions to ensure that they meet the requirements of a professional didactic test. The following criteria were introduced and verified: objectivity, reliability, accuracy, diagnosticity, and test standardizations.

Eye-tracking test – the most important in this technique is the objective diagnosis factor which allows the registration and visualization of data on the point of gaze and movement of eyeballs. The obtained perception data are objective and precise, irrespective of the individual's subjective attitude. The findings thus provide information on the current manner of visual perception. In general, the study consisted in the tracking of eyeball movement and stop points. Eyeball movements can be intentionally controlled in the course of active search for information. Certain tracking and saccadic (jerky) movements occur automatically, with many relocations recorded at a rate of 300 ms.

Since the eye-tracking measurement technique is characterized by high quality and mathematical precision of recording, a strong correlation exists between the correct assessment and interpretation of input data. The input data are generated through the presentation of an image to the analyzed individual. Every image is shown at specific time intervals, which ensures that the data are recorded in a stable and consistent manner. The analysis and interpretation of the collected data utilized three time intervals – max. 4 seconds, max. 8 seconds, and max. 12 seconds. This entailed the creation of a triple database with data registration time as its discrimination criterion. The time intervals were defined on the basis of many years' experiences, observations, and lessons learned from experimental studies of the author, as described in many publications (for example, cf. Wawer 2014; Kirenko, Wawer 2015, Wawer, Wawer, Czerski 2010, pp. 309–315, 316–322; Wawer, Kirenko 2012, pp. 312–337; Wawer, Pakuła 2015, pp. 193–210; Wawer, Wawer 2010, pp. 290–296 and others). Methodology behind the eye-tracking technique relies on statistics used in other types of research. The most complete results are obtained by combining the eye-tracking technique with classic methods from the domain of social sciences (as was the case here).

In studies on the correlation between the level of knowledge and the visual perception of pedagogy students in respect of s-v, eye-tracking was the only possible way to reveal changes in the perception of images which depict rules or principles of human behavior.

The research material comprised a selection of photographs which, however, did not constitute an educational resource. The respondents were not requested to learn by watching the images – on the contrary, perceiving the image was an indication whether in the image the respondent discovers elements, relationships or associations suggesting the violation of s-v rules. The photographs were presented to the respondents without any descriptions or suggestions as to what they should focus on. Pointing to any specific areas of the image as particularly important would stand in opposition to the very essence of the study. The students were given a free hand as to how to watch the photographs, and paying special attention to those elements which they deemed important, interesting, etc. to be disclosed (in the form of fixation or observation frequency).

The number and accessibility of images as well as the easiness of creating them[1] evoke a new situation which directly impacts on the education process. Learning, teaching, acquiring knowledge – all these activities involve watching: between representation and presentation, a symbol and a symptom, designation and supra-designation, and more recently, between visibility and visuality (see: Didi-Huberman 2012). Image is now becoming closely synonymous with communication. Educational content becomes increasingly deverbalised, with images becoming more and more reflective of the learners' reality; they permeate and authenticate cognitive processes, simplify the reception, but also tend to cheat, trivialize, oversimplify or limit thinking. Consequently, a need emerges for images to be analyzed, optimized, and verified. Effective teaching should, among other things, take into account the individual preferences of the student, inclinations, experiences, and abilities that will turn into memory traces in the brain. Most of these factors can be measured (seen) with the use of visual perception.

The text outlines the relations between the level of students' knowledge, visual perception and social stratification, university major, and the year of studies, i.e. aspects which, as of yet, have not been analyzed on a group basis. The research designed in this manner aimed to fill a gap as regards literature on this field of empirical research. It should be noted, however, that it is impossible to directly compare the obtained results with other findings of this type due to the comparative explorations being, as previously mentioned, of a precursor nature. Nevertheless, detailed analyses revealed certain regularities and trends which were then compiled and recorded in line with the ordering of the analyses:

• Marked effect was found to be exerted by an increase in the level of knowledge, following the introduction of the training factor.

---

[1] What I mean here is the registration and replication of images.

- On analyzing the results of the s-v didactic test (pre-test and post-test) it was revealed that the factor differentiating the levels of knowledge is social origin, the influence of which manifested itself only during the s-v post-test.
- Respondents who declared to come from the intelligentsia obtained significantly higher scores in the s-v test than those of peasant or working-class origin. The same correlation emerged from the s-v test, treated as an arithmetic mean obtained from two results of this test.
- On the other hand, the university major and the year of studies did not differentiate the analyzed group.

Further analyses were used to establish the correlation between an increase in the knowledge level indicator (treated as an arithmetic mean of two results of the conducted s-v didactic test) and the s-v knowledge effect (treated as an average number of all fixations made in all categories) recorded in the process of a two-time eye-tracking test. The conclusions were drawn for the defined observation intervals (max. 4, 8, and 12 seconds).

The max. 4-second observation interval
- From the analyses of the average fixation times for all categories it can be inferred that differences exist as regards the average time of all fixations during the pre-test and after the introduction of a training factor for the post-test. This means that, each time after completing the post-test and, consequently, raising their s-v knowledge level, the respondents, in the second eye-track measurement, focused their attention longer on defined areas of particular categories.

- The in-depth measurement of 28 (AOI variables) defined in all eight categories seems to confirm the existence of a significant knowledge enhancement effect, meaning that for almost half of the defined AOI variables the observation times recorded for these were significantly longer during the second eye-tracking measurement.

- Measurements and analyses of the relationship between social stratification and the average time of observation of all categories for the s-v knowledge effect indicate that the social origin is not related to the average time of recorded fixations.

The max. 8-second observation interval
- Analyses of average fixation times for all categories indicate that there are significant differences in the eye-tracking study with respect to average observation times between the first and second measurement, after the introduction of the training factor.

- An in-depth analysis, which involved the comparison of average observation times for 28 variables in the 1st and 2nd measurement after the introduction of the training factor, showed a significant effect confirming an increase in the level of s-v knowledge in each category.

- It was revealed that the effect of s-v knowledge in the analyzed social groups is not related to the duration of observations made in the 1st and 2nd eye-tracking measurement.

The max. 12-second observation interval
- Also in this range of observations, the measurement of eye-tracking data concerning average fixation times for all categories revealed substantial differences with respect to average observation times between the 1st and 2nd measurement, after the introduction of the training factor.

- An in-depth analysis of the maximum observation time, concerning the comparison of 28 AOI variables in the 1st and 2nd eye-tracking measurements after the introduction of the training factor, with respect to average observation times, showed a substantial impact of increasing the indicator of the s-v knowledge level.

- It was revealed that, as in the previously analyzed observation periods, social origin is not related to the average time of observation of all categories and to the s-v knowledge effect.

With regard to the proposed hypotheses, it should be stated that the first hypothesis has been verified positively. Furthermore, the course of varied analyses suggests that **the level of students' s-v knowledge is related to the change in the manner of visual perception. Such conclusions were presented for all of the analyzed observations periods.**

The second hypothesis has not been confirmed. **Analyses carried out in this area did not reveal correlations between social origin, university major, and the year of studies, as factors differentiating results with regard to observable change in students' visual perception, determined by changes in the level of s-v knowledge in the eye-tracking test.** It should only be emphasized that while social origin differentiates the process of knowledge acquisition itself, this variable does not allow one to conclude that social origin affects the manner of perception after changing (increasing) the level of knowledge of the analyzed group.

Use

The analysis and the conclusions drawn on their basis make it possible to consider the usefulness of the explorations carried out in respect of s-v knowledge in the pedagogical context.

Taking into account the scope of educational sciences (their essence, goals, content, methods, means and forms of organizing educational processes), the above-mentioned research compiles with the explanatory and practical function (Okoń 2003), because it enables the control and monitoring of selected conditions of the education process in the s-v area and the introduction of new factors into this process in a controlled manner. This research helps to better understand and explain the complexity of the educational process and to detect regularities pertinent to this process. At the same time, it determines the achievement of a new quality by this process under the influence of experimental factors which were introduced here. By establishing the correctness of the educational process, the teacher has the opportunity to learn more about the didactic reality and to influence it more effectively, using innovative and original techniques and research methods.

The presented research material translates directly into the practical sphere with respect to designing didactic material, printed textbooks and electronic textbooks used by the teacher in pedagogical settings. The applied principles of graphic message design lead to a reduction in the recipient's cognitive load and can be verified before their introduction to the teaching material (cf. Sweller, Chandler 1994, pp. 185–233). This factor corresponds closely to the theory of multimedia education proposed by R.E. Mayer (2005). According to this theory, materials intended for educational purposes should be developed in such a way as to help the teacher incorporate textual and visual representations into a holistic mental model, which in turn can be verified by means of eye-tracking tests (see: Mayer 2005, p. 188).

The analyses made concern the verification of s-v knowledge, but, as already stated, they are based on a broader spectrum of knowledge verification which utilizes students' visual perception.

Learning and the acquisition of knowledge exerts impact across two aspects: increasing the knowledge resource and improving the learning process itself. As argued by S. Dylak, "(…) we know more, but we also know differently – we look at what we already knew in a different context" (see: Dylak 2002, p. 4).

This thought captures the essence of the conducted research. This is because the experimental research which has been carried out indicates that the manner in which we perceive reality is not only a specific and highly individualized process, but is also determined by our knowledge level. This correlation supports the instinctive belief that understanding of the observable world is more complete and precise if we know more about it. Therefore, increasing the level of s-v knowledge implies a different, more sensitive way of perceiving human behavior, in both the axiological and praxeological aspects. This is a notable observation, because respecting universally recognized values and s-v rules forms part of the prevalent social order. It can also be treated as a vital element of the social structure. No less importantly, it plays a fundamental role in building one's own image, both at work and in private life, self-esteem and self-confidence (which is particularly important for young women), as well as professional or social position, etc.

- The study of the application of eyetracking research in pedagogy also includes a self-prepared, combined study of the fourth chapter of a co-authored monograph – Janusz Kirenko and Rafał Wawer: *Distance vs. Tolerance. The Perception of Disability in Eye-Tracking Studies*, (MCSU Press, Lublin 2015). The paper was a result of an internal research project which I led. The project was designed and implemented by the Institute of Pedagogy of the Maria Curie-Skłodowska University in Lublin. The research topic was: "The perception of disability in eye-tracking studies".

My contribution to the development of the monograph and project included:

    • scientific project management, including the research described in the monograph
    • co-author of research idea and model

• preparing and selecting of research material
　　• selecting a community sample
　　• preparing and conducting of pilot studies
　　• self-development of the whole eye-tracking and survey research
　　• preparing the obtained results for statistical studies
　　• preparing the manuscript text included in chapter IV
　　• co-author of the introduction to the monograph
　　• preparing the conclusion
　　• preparing the annexes and the final version of the text
　　Description: the monograph and project consist of two parts.

The first part is an analysis of the perception of disability in determining the relationships between attitude tendencies of the respondents, namely tolerance and distance with their psychosocial functioning in several dimensions: the sense of coherence, self-esteem, emotional intelligence, social skills and the perception of disability (chapters I, II, III of the monograph: J. Kirenko).

The second part is a set of eye-tracking optimization studies in pedagogy, extended by a new, so far unexplored, method of visual verification of quantitative and qualitative data. The context of undertaken interpretations and existing emotional relations had been detained in the situations of disability perception. At the same time, the directions of the emotional ties are analyzed in the attitudes of distance and tolerance (chapter IV of the monograph: R. Wawer).

In the project, the issue of disability is a spur for building a model of empirical studies which aim to determine individual differences in the perception of disability and their psychosocial relationships related to persons with an attitude of tolerance and distance.

Chapter IV presents an analysis of selected relationships between the parameters of eye-tracking measurements, divided in groups, with the attitude tendencies of the responding students, namely tolerance and distance. Correlating variables used for the analysis are: duration and number of observations occurring in four intervals: 2, 5, 10 and 15 seconds. In the study there was also carried out a visual verification of the performed statistical analyses in connection with interpretation of existing emotional relationships.

Individual differences in the perception of disability and their psychosocial correlates were presented as an object of theoretical and empirical research. It is reflected in the key assumptions of social attitudes towards people with disabilities in the context of these two discussed phenomena – tolerance and distance, assuming that the defined attitudes correlate with self-esteem, sense of coherence, emotional intelligence and social competences (chapters I, II, III).

The results of the conducted eye-tracking studies on the perception of disability by the responding students, diversify the compared groups into the attitude of tolerance and distance. In the literature on the subject, the author did not find empirical exploration indicating the existence of any relationship between these variables. It introduces a new research element in this field. Hence, definite conclusions are difficult to formulate, since the undertaken correlation studies are, as it was already mentioned, of the experimental-pioneering nature. Therefore, to make a comparison of the obtained results with other ones, does not seem possible. However, some trends can be recognized in the conducted analyses. In all conclusions of empirical chapters there were made synthetic summaries and presentations of the obtained results.

In chapter IV (submitted for evaluation), the distribution of eye-tracking explorations suggests the existence of common psychological features characterizing the responding group of students. In the procedure of conducted multiple analyses (in the assumed intervals of times of observation), the obtained results indicate statistically significant differences between the students who were in favour of tolerance and students who were in favour of distance, depending on the accepted observation time. Similarly, in each case, making further exploration revealed the structure of the independent variables, which were more or less correlated with the dependent variable of a given coincidence.

It has also been reported the emotional dependency which occurs in the photographs of disability. The biggest differences appear in the areas defined as disability determinants symbolizing disability (i.a. components of a wheelchair, woman's feet placed on foot rests, wheels of a wheelchair) and in the pictures of emotional relationships (i.a. handshake, smile, raising hands). People who distance themselves paid more attention, watching the additional, emotionally passive, elements (i.a. sea, blades of grass, flowers). Additionally, in this group it has

9

been observed the saccadic multidirectionalism. It is believed that this may be the result of a lack of clear conviction as to the willingness to recognize the phenomenon of disability. It is also noted the raised cognitive curiosity of a group with an attitude of tolerance. An example is the increased amount of fixation when handling, for example, a computer keyboard (pictures in the book) by disabled people. Cognitive curiosity and the need to understand the surrounding reality, belong to the basic functions of the process of perception, perhaps because in persons with the attitude of distance there is a need to inquire combined with distrust. They scrutinize more precisely the images which define disability, looking for explanations and answers.

To deepen the research analyses, there was carried out the procedure of the assignment of emotional significance to the defined AOI. Analyses reveal existing relationships for persons who distance themselves from taking various initiatives or abilities which are necessary for their successful solution, as well as the efficient physical functioning – more lively, full of tenderness, attention and care. Whereas a higher level of confidence and courage, keeping calm in difficult situations, formality, and the ability to express feelings characterize people with an attitude of tolerance. It has also been observed the divergence of the variables that differentiate the groups of the responding students. For people with an attitude of distance, the following adjectives are of great importance: original, kind, resolute, towards the people with an attitude of tolerance, and careful, cordial, natural, or polite. For those who are tolerant, their originality is of greater importance, trying to be in opposition to something which is commonly known or accepted, giving pleasure to someone, provoking a pleasant feeling, quickness in decision-making, as well as courage, and not losing confidence. Meanwhile, people who distance themselves in a higher degree reveal the prudence, kindness and openness, as well as the friendliness towards nature, in accordance with its laws, as well as the demeanor which is in line with accepted social norms. It is important that the reference system is a system which reflects the average results in the population. Therefore, latter rank positions and the correlation coefficient at the level of statistical importance, enable to assume that a group of people with the attitude of tolerance is highly similar to a group of people with the attitude of distance in terms of the hierarchy of intensity of both the frequency and the times of observation of the defined AOI.

The aim of the study presented in the project has been achieved, taking into consideration the multifaceted issue along with the relevance and justification of the choice of psychosocial correlates of people with the attitude of tolerance and distance. An eye-tracking measurement technique is, in principle, a programming mathematical algorithm. This factor makes approximation or tolerance impossible. Hence, a graphical research result is both a quantitative and a qualitative record of physiological tendencies of perception. The possibilities of inference and generalizations increase when the eye-tracking technique is combined with the traditional method of quantitative measurement. It has been done in the project and its development.

The obtained results did not correspond to the expectations, or the constructed concept of research resulting from the conducted theoretical analysis. Taking this into consideration, the paper provides a database for further detailed and multifaceted research and studies.

4.4. Discussion of other (selected) scientific-research achievements

4.4.1. Authored and co-authored monographs

• **Computer Animation in the Educational Process**
Published by: MCSU Press, Lublin 2008 /160 pages/. 100%
On the basis of the previous research experience and continuing interest in effective teaching and learning, in the monograph there was discussed an important issue which undergoes systematic transformation and modernization, namely, vocational education. In recent years, one can observe efforts for the revival of vocational education. The aim of the book was to design and realize a pedagogical experiment involving the study of the effectiveness of three-dimensional teaching computer animations used in the process of education in vocational schools.
The main objective of the research and research problems were subjected to a statistical analysis. On the basis of the literature on the subject, the analysis of selected problems of cognitive science in the teaching process, interpretation of human mental image, visual perception and the principles of communication in virtual reality constitutes an addition to the book.
• **Knowledge Sustainability in the Educational Process**
Published by: Difin, Warsaw 2013 /211 pages/ 50%
The main objective of the research presented in the monograph was an attempt to expand the scope of research discussed in the book entitled Computer Animation in the Educational Process. In the conducted explorations, the focus was on the sustainability of acquired knowledge.

In the monograph, there was used an experimental research approach in order to demonstrate the relationship between a specific variant of the traditional teaching method used in the educational process, and the results of the education process, reflected in the form of sustainability of acquired knowledge. For the main objective outlined in this way, a supporting objective was specified, which involved demonstrating the relations between the above areas and the style in which the surveyed group received information.

The conducted studies were preceded by the studies on educational technology used in the multimedia message, memory, and its determinants in the educational process, knowledge sustainability in the system of human perception and connotative aspects of individual knowledge acquisition styles.

- **Eye-tracking in Media Education Spaces**

Published by: Lublin Scientific Society, Lublin 2014 /144 pages/ 100%

A monograph based on the published (previously distributed) articles which, in essential parts, were planned, conducted, analyzed and described by a postdoctoral candidate. The title Eye-tracking in Media Education Spaces encompasses the research explorations conducted within that cycle. The results and conclusions of the research experiments described in the book, constitute an attempt to answer to the following question: how does modern man perceive the surrounding reality and in which part the message, which is encoded in the visual transmission, is interpreted by the receiver?

4.4.2. Edited monographs

Information and Communication Technologies in Education of the 21st Century
Published by: Lublin Scientific Society, Lublin 2014 /237 pages/ 50%
The book entitled Information and Communication Technologies in Education of the 21st Century is a multifaceted attempt to assess the introduction of computers into schools and its results for modern education. Currently, teachers' IT skills are insufficient. What seems to be more important is pointing the rules of teaching and educational procedures in the process of education and preparation for creative use of the computer. Therefore, the papers on this issue seem to be important from the point of view of both the need of the exploration of the status quo (ie. knowledge, skills and possible shortcomings in the implementation and use of IT in a modern school at its all levels), and the methodology of work with IT. The scope of the research includes a number of very specific indications and examples of work with IT in a present-day school.

The study was divided into three parts entitled: ICT in Education, Practical aspects of the use of information technologies in the educational process, and Methodological aspects of the adoption of latest technologies and multimedia applications.

Modern Media in the Educational Spaces
Published by: MCSU Press, Lublin 2015 /150 pages/ 50%
The issue discussed in the monograph entitled Modern Media in the Educational Spaces is current, relevant and useful also, and perhaps above all, in the social sciences. The texts contained in it, are of interdisciplinary, sometimes comparative nature. Scientific grounds, creating both the place and the meaning of the contained texts, are the results of both theoretical, research studies, and the authors' professional experience. The results of empirical studies and implemented educational practice have not only an individual but also a collective or a group dimension.

The discussed topics are of interest to academia, starting from those who plan the next stages of education and training, to teachers and pedagogues who have a direct, day-to-day contact with the student, creating and using both traditional and digital media support in the educational process.

Possibilities and limitations of new information technologies in education, [in:] Lublin Pedagogical Annual, vol. 36, no. 4
Published by: MCSU Press, Lublin 2017 /211 pages/ 50%
The relationship between education and media is of particular importance. With the basic use, one can formulate the thesis that the media is a means of facilitating the learning process, but a more detailed analysis reveals several doubts and questions: How to look for ways to optimize the use of media in education? How to shape the IT competences of teachers? What is the risk of media addiction? What is today's knowledge and how to use it? Has the learning process changed? If so, in what way? These issues only indicate some aspects of media implementation to the education process, but certainly they are cause for reflection. The authors of this study try to provide the answers to the above-mentioned questions.

4.4.3. Educational studies (university textbooks, student textbooks, methodological guides, workbooks)

Mediation in School. The Supporting Method. Multimedia Methodical Guide

11

Published by: MCSU Press, Lublin 2008 /digital record, DVD/ 50%

A research issue concerning the creation and implementation of attractive and effective multimedia materials to the educational process has been known and explored by many scholars for a long time (see: Strykowski 1973, Skrzypczak 1985, Denek 1980, Fleming 1961, Kupisiewicz 1974, Lewowicki 1993, and others). Making the learning process more technical was possible thanks to the latest technology, the growth of technical culture of society, as well as making the teaching and learning more similar to modern production processes (see: Strykowski 1997 as cited in: Lipowski 1996).

The abundant literature, the experience of other researchers and the authors' exploration research in various fields of media pedagogy led to the creation of a methodological guide for students of pedagogy of social rehabilitation. The paper is in fact a book in the film form. It provides an insight into: what is mediation, what are its rules, steps and techniques. The prepared material has become an addition to routine teaching methods of pedagogy students, psychologists, school counselors and teachers. Material along with a built-in interactive "menu" allows one to configure any content, exercises, examples and summaries.

4.5. Data from Harzing's *Publish or Perish* program (Annex)

Rafał Ireneusz Wawer - UMCS
Publish or Perish 6.40.6326.6879
Search terms
Profile ID: waD2TTUAAAAJ
Profile name: Rafał Ireneusz Wawer - UMCS
Profile labels: "pedagogika medialna"
Data retrieval
Data source: Google Scholar Profile
Query date: 2018-12-26 11:43:09
Cache date: 2018-12-26 11:43:09
Query result: [0] Operacja ukończona pomyślnie.
Metrics
Reference date: 2018-12-26 11:43:09
Publication years: 2005-2018
Citation years: 13 (2005-2018)
Papers: 50
Citations: 41
Citations/year: 3.08
Citations/paper: 0.80
Citations/author: 31.00
Papers/author: 37.00
Authors/paper: 1.62/1.0/1 (mean/median/mode)
Age-weighed citation rate: 6.41 (sqrt=2.53), 4.99/author
Hirsch h-index: 3 (a=4.44, m=0.23, 29 cites=72.5% coverage)
Egghe g-index: 6 (g/h=2.00, 37 cites=92.5% coverage)
PoP hI,norm: 3
PoP hI,annual: 0.23

4.6. Chapters in books

• Wawer M., Wawer R., Knowledge management in enterprise strategy in practice of companies in the region of Lublin, [in:] Szabłowski J. (ed.), Changes in Organizations Management Strategies, University of Finance and Management in Białystok, Białystok 2009 (pp. 333–345) [ISBN 978-83-60432-50-1].

The text discusses the essence of knowledge management concept, and defines the following concepts: data, information, knowledge. The influence of knowledge management on building a strategic competitive advantage was discussed as well. There were presented the results of empirical studies conducted by the authors among the employees of 12 companies located in the Lublin region. An objective, scope, and the results of the study were presented. Finally, there was formulated a conclusion about the need to actively promote the concept of knowledge management in smaller firms, which are not market leaders, but they should implement knowledge management as dynamically as organizations that currently are an example of good practice in this field.

• Wawer R., Czerski W., Increasing the efficiency of education using modern information technologies, [in:] Jastriebow A. (ed.), Information Technologies in Science, Technology and Education, Technical University of Radom, Radom 2009 (pp. 225–228) [ISBN 978-83-7351-351-8].

The text refers to commonly introduced multimedia computer technologies which result in searching for new methods of teaching and learning. The level of effectiveness of various computer technologies in educational process depends on the quality and selection of the software. The educational process requires preparation of appropriate and effective didactic materials. Such a requirement also appears in the popularization of distance education or autodidacticism using the Internet, as well as in the design of stand-alone multimedia presentations.

• Wawer R., Wawer M., Educational computer animation in the multimedia professional education, [in:] Kiełtyka L. (ed.), Multimedia in Business and Management, Difin, Warsaw 2009 (pp. 313–320) [ISBN 978-83-7641-129-3].

The constant development of information technologies affects the diversity of defining the virtual space. Noticing the difference between virtual reality and cyberspace is important, because both names are often used interchangeably, and they are fundamentally different in terms of communication. The discussion of this issue is presented in the passage of the article, which refers to separation-based programming and educational computer animation used, among others, in the field of education. Vocational education is one of the beneficiaries of virtual educational space in which one can introduce technological processes and methods of design. Moreover, one can change the duration of the action, and delaying or acceleration of these processes allows one to see and understand the phenomena presented to students. For these and many other reasons, educational computer animations are increasingly used as a didactic material placed in a virtual educational space.

• Wawer R., Wawer M., The computerization of educational multimedia, [in:] Grudniewski T., Olchowik J. (eds.), Information Technologies in Applications, State School of Higher Education in Biała Podlaska 2009 (pp. 195–202) [ISBN 978-83-61044-72-7].

The text presents the subject of computerization of educational media. There were discussed the didactic functions of a computer as a tool which supports the work of the teacher, as well as the objectives and tasks of computer-aided education. In the third part of the article, there were examined, in detail, the problems and circumstances of the perception of a multimedia message from the point of view of educational and psychological research and their reference to educational results.

• Wawer R., Wawer M., Model simulations – a modern method of vocational training, [in:] Sałata E. (ed.), Problems of Education and Teacher Training, Technical University of Radom, Radom 2009 (pp. 207–212) [ISBN 978-83-7204-851-6].

In the text, there were partly presented research which had been carried out earlier by the postdoctoral candidate, in which two hypotheses had been formulated: 1. It is assumed that using model simulations will raise the efficiency of education among vocational school students. 2. It is assumed that knowledge conveyed to vocational school students through model simulations will be better acquired. The independent variable was the use of the model simulation, another independent variable was the school that the surveyed students attended. Whereas training effectiveness and knowledge sustainability constituted the dependent variables. The researchers pay attention to the relevance and need for using teaching materials in the form of model simulations among the

students of vocational and technical schools, which will contribute to more effective teaching and enhancing the knowledge acquired by young people.

• Wawer R., Wawer M., The promise of bionic vision, [in:] Information Technologies, Scientific Papers of the Faculty of Electronics, Telecommunications and Informatics (ETI) of Gdańsk University of Technology, vol. 19, Gdańsk 2010 (pp. 181–186) [ISBN 978-83-60779-02-6].

The text discusses the presentation of the idea of bionic vision using the latest technology. Bionics is an interdisciplinary science that studies the structure and functional principles of living organisms and employing them in technology and the construction of technical devices inspired by living organisms. The article discusses the principles of construction of contact lenses which constitute the basis of bionic vision and a schematic overview of the technological process of the formation of such lenses. The article also refers to technological and information challenges, and the safety and comfort of the user. The focus was on the vision of the use and potential applications in a variety of fields – from education to security.

• Wawer R., Wawer M., Interim evaluation of government workers – theory and practice, [in:] Janowska Z. (ed.), Dysfunctions and Pathologies in the Field of Human Resources Management, University of Łódź, Łódź 2010 (pp. 300–308) [ISBN 978-83-7525-469-3].

The aim of this paper was to present the results of studies on the way the interim evaluation of employees is carried out in local government units, and whether the implementation and use of the evaluation results meet the main assumptions of effective implementation of theoretical concepts described in the relevant literature. In the conducted analysis there were presented some selected fields directly linked to an employee's perception of activities carried out by the employer, and the participation and role of subordinates in the process.

• Wawer R., Wawer M., Eye-tracking optimization in the social communication, [in:] Kwiatkowska G., Markiewicz K. (eds.), Communicating. New Challenges, MCSU Press, Lublin 2010 (pp. 97–108) [ISBN 978-83-227-3188-8].

The text addresses the current topic of eye-tracking optimization of non-verbal messages in the space of social communication. There were discussed the issues related to the theory of human modality systems in conjunction with the essential information on the application of both the mobile and stationary eye-tracking. Special attention was paid to the complementarity of the eye-tracking research methodology with the traditional method of statistical calculations.

• Wawer R., Wawer M., Synergy of eye-tracking and visual perception in an expert system, [in:] Goluchowski J., Filipczyk B. (eds.), Knowledge and Communication in Innovative Organizations. Expert Systems – Yesterday, Today, Tomorrow, University of Economics in Katowice, Katowice 2010 (pp. 76–83) [ISBN 978-83-7246-601-3].

The article discusses a modern expert system which serves i.a. to diagnose visual messages. Defining the areas which are crucial in the message, which depends on the image information, is a key element of a local knowledge base. A software coordinator of the system is a computer program with built-in statistical analysis tools and on-screen graphics visualizing the obtained results.

• Wawer R., Wawer M., Language training of employees as a source of competitiveness of Polish enterprises in the era of globalization [in:] Gierszewska G., Kisielnicki J. (eds.), International Management. The Competitiveness of Polish Enterprises, Łazarski University Press, Warsaw 2010 (pp. 205–217) [ISBN978-83-60694-27-5].

The text discusses the issue of language training offered by employers in order to increase the development of knowledge management and employees' competencies, and thus the enhancement of competitiveness of Polish enterprises in the conditions of globalization. It focuses on building a strategy of language training and modern education methods – e-learning and blended learning.

• Wawer R., Wawer M., Czerski W., The measurements of the appeal of perceptual distractors in a visual message – preparation of research, [in:] Morbitzer, J. (ed.), Man – Media – Education, Pedagogical University of Kraków, Kraków 2010 (pp. 309–315) [ISBN 978-83-7271-615-6].

The text describes the measurement technique to determine the impact of a visual message on the recipient. In the analysis there were included the measurement of the appeal and efficacy of conveying taking into account the

stimuli which disturb the reception. The primary factors causing the increase or decrease the recipient's attention during perceiving are perceptual features. The article refers to the possibilities of their examination through description of the process of preparing the experimental research.

• Wawer R., Wawer M., Czerski W., The analysis of own research results of the measurements of the appeal of perceptual distractors in a visual message, [in:] Morbitzer, J. (ed.), Man – Media – Education, Pedagogical University of Kraków, Kraków 2010 (pp. 316–322) [ISBN 978-83-7204-915-5].

The article contains calculations of the appeal and efficacy of conveying distinguishing perceptual features. Based on research results, the author describes the power of a perceptual distractor expressed in the following relationship: quotients – the product of the length of the observation of the distractor in proportion to the entire time of the message exposition (in %), the inverse proportion of the product of the sum of the duration of initial fixation in one second's time, the number of times the distractor is perceived in one second's time.

• Wawer R., Czerski W., Eye-tracking analysis of the composition of the website – own research results, [in:] Knowledge and Communication in Innovative Organizations. Electronic Communication, University of Economics in Katowice, Katowice 2011 (pp. 464–477) [ISBN 978-83-7246-683-9].

The text analyzes the results of research on the graphic composition of the webpage of the Complex of Schools in Kalinówka. The main research problem was looking for an answer to the following question: How does a graphic composition and what elements included in the website influence the efficiency of a message? This article is a part of eye-tracking explorations conducted on the optimization, verification of ergonomics, in the context of the usability of the website taking into consideration: the target group of users, time of access to information and the purpose of the presented information.

• Wawer R., Czerski W., Using the eye-tracking to analyze the educational web portal – own research results, [in:] IT in the 21st Century. Science, Technology, Education and the Modern Software Technologies, Technical University of Radom, Radom 2011 (pp. 340–350) [ISBN 978-83-7789-008-0].

The chapter deals with the issue associated with e-learning portals. First, there are discussed the types of e-learning techniques and an overall design of distant education web portals. The main purpose is to prepare a report on self-prepared research based on the analysis of the website of the Virtual Education Centre of the Subcarpathian Teacher Education Centre. The aim of the study was to find answers to the following questions: how does a graphic composition and what elements included in a website influence the efficiency of a message, and whether detailed information displayed on the website of the "Centre" is actually located in the menu, and what is the access time for finding specific information?

• Wawer R., Wawer M., Eye-tracking identification of perceptual features in a virtual educational reality, [in:] Migdałek J., Stolińska A. (eds.), Information Technologies in the Teacher's Workshop. The New Educational Challenges, Pedagogical University of Kraków, Kraków 2011 (pp. 288–298) [ISBN 978-83-7271-649-1].

The chapter presents the method of perceptual features identification used in modern teaching material integrated into the virtual reality in order to focus attention. On the example of a self-prepared study on the educational computer animation, which was intended for vocational schools, there had been used an eye-tracking tool, to optimize didactic materials aimed at improving the effectiveness of the teaching process.

The essence of the perceptual features is a stimuli action. Reception of such signals naturally stimulates the sense of sight, reinforcing the message perception. The multitude of additional attracting factors can be described for example by: movement, color, shape or contour. The survey results were presented in the form of heat maps and gaze plots, which objectively define the areas which activate the recipient, but also reveal the distractor. This example is just another of the many eye-tracking technology applications.

• Wawer R., Kirenko J., Analysis of the perception of the content of the information boards exhibited in the educational space of the State Museum at Majdanek – own research results, [in:] Biedroń M., Wawrzak-Chodaczek M. (eds.), Communication as a Tool of Understanding, from the series of Social communication in the real and virtual world, University of Wrocław. St. Marienthal, Ostritz 2012 (pp. 312–337) [ISBN 978-83-7780-522-0].

Historical spaces, also called educational spaces, function as a medium of a historical message. To increase the educational and emotional value, the information is presented in the form of information boards. The article

constitutes an attempt to answer the question: in what way are messages displayed on an information board analysed and in what way do they correlate with the space in which they have been placed? The study was conducted using an eye-tracking technology. "Mathematicised" test results show the trends taking place in the visual perception of information displayed in the educational space.

• Wawer R., Pakuła M., Communication in the area of history education of former nazi concentration camps, as perceived by the young and elderly: An eye-tracking analysis, [in:] Wawrzak-Chodaczek M., Kowal J., Ostapiuk K. (eds.), Communication and Information Technology in Society – V. 1. Real Communication, Cambridge Scholars Publishing, British Library Cataloguing in Publication Data Newcastle 2015 (pp. 193–210) [ISBN (10): 1-4438-7537-6].

Historical education is recognized as one of the most important parts of the activities that take place in memorial museums, and this manner of perceiving the exhibition area is thus very essential. This process depends on the provision of many attractors, and the most significant are probably age and life experience. This chapter reveals the theoretical and methodological bases of studies on the perception of the exhibition area by way of a modem eye-tracking method. The participants in the study comprised university students and a group of elderly people.

• Wawer R., The effectiveness of education – how to understand it, [in:] Knowledge and Education – How To Teach Effectively, "Tygiel", Lublin 2018 (pp. 16–23) [ISBN 978-83-65-932-30-3].

The effectiveness of education in literature is captured in the sphere of two features: theoretical and application values. Efficiency, therefore, is connected with multidimensionality and multithreading. In management, the concept of organizational and economic efficiency is dominant, but in case of the effectiveness of cognitive education, the subject of inquiry is: knowledge, comprehension, application, analysis and synthesis are treated primarily. The article discusses many variables in the effectiveness of education: the work of pupils and teachers, educational goals, education principles, content of education, educational methods, forms of education, teaching aids, material and technical basis, control and evaluation procedures and the duration of education process.

4.7. Articles in serial publications (Annexes)

• Wawer R., Wawer M., *The use of virtual educational space on the example of didactic computer animations*, [in:] EDUCATION – TECHNOLOGY – COMPUTER SICENCE, No. 1/2010, part 2, University of Rzeszów, 2010 (pp. 202–208) [ISSN 2080-9069].

The development of information technologies affects the diversity of defining the virtual space. Noticing the difference between virtual reality and cyberspace is important, because both names are often used interchangeably, and they are fundamentally different in terms of communication. The discussion of this issue is presented in the passage of the article, which refers to separation-based programming and educational computer animation used, among others, in the field of education.

Vocational education is one of the beneficiaries of virtual educational space in which one can introduce technological processes and methods of design, present the structure of machines and devices, analyze the chemical processes, or a molecular structure. Moreover, one can change the duration of the action, and delaying or acceleration of these processes allows one to see and understand the phenomena presented to students. For these and many other reasons, educational computer animations are increasingly used as a didactic material placed in a virtual educational space.

• Rzemieniak M., Wawer M., Wawer R., *Breakthroughs in assessing the perception of outdoor advertising*, [in:] *Studies and Works of Management and Finance College*, Scientific Paper 100, Warsaw School of Economics, Warsaw 2010 (pp. 171–180) [ISSN 1234-8872].

In the article, the focus is placed on the tool, which is used both in companies using modern marketing, and advertising agencies that want to provide their customers with effective solutions in terms of the perception of outdoor advertising. Paying attention to the message is crucial for an advertisement to successfully get through to its recipient (perception of the message gives the recipient the possibility of its interpretation and evaluation). Eye-tracking has also become a breakthrough where subjectivity of research and conclusions led to errors in implementation of promotional strategies, and consequently became a source of irrational spending of funds for this purpose.

• Wawer M., Wawer R., *Eye-tracking research in consumers' behavior diagnosing*, [in:] Actual Problems of Economics, 6(108)/2010 (pp. 290-296), Kiev 2010 [ISSN 1993-6788].

In the hereby article, the authors discussed the topic of an eye-tracking diagnosis of communiqués within the field of merchandising. Issues connected with the essence of eye-tracking research and the use of mobile and stationary eye-tracking in micro- and macro navigation were presented. Particular attention was drawn to results of and conducted an eye-tracking research in connection with strategy of localizing products "on the shelf". The authors indicated the necessity of taking the presented analyses because of the need for consistent cost decrease, enterprises' income increase and, as a result, improvement of their economic rates.

• Czerski W., Wawer R. *Training school teachers in the field of IT – own research results*, [in:] Walat W., Lib W. (eds.), EDUCATION – TECHNOLOGY – COMPUTER SCIENCE. *Selected problems of technical and professional education*, No. 2/2011, part 1, University of Rzeszów, 2011 (pp. 277–283) [ISSN - 2080-9069].

The article is concerned with the subject of training school teachers in the field of IT. It is the analysis of the survey, during which the information on the software used by educators and the ways of its use was collected. In addition, there was obtained information on how and where educators gain knowledge about the software they use.

• Wawer R., Wawer M., *Using modern computer techniques for the emotion measurement based on the study of photography*, [in:] Ogonowska A. (ed.), *Studies de Cultura II*, Annales Universitatis Paedagogicae Cracoviensis Folia/film 103, Kraków, 2011 (pp. 49–57) [ISSN 2083-7275].

The text constitutes an attempt to explain an objective measurement technique for the perception of reality presented in pictures, while taking into account the author's momentary mental states, the "directional tensions" internally perceived by the author, and the purpose that accompanies the recording of reality. This article was intended as a spur for discussion on optimising visual messages, including the emotional states of their sender and receiver.

• Popko A., Jakubowski M., Wawer R., *MemBrain neural network for visual pattern recognition*, [in:] Adv. Sci. Technol. Res. J. 2013, 7(18) (pp. 54–59) [ICID: 1051257] [ISSN 2080- 4075].

Recognition of the visual patterns is one of significant applications of Artificial Neural Networks, which partially emulate human thinking in the domain of artificial intelligence. In the paper, a simplified neural approach is a recognition of visual patterns is portrayed and discussed. This paper is dedicated for investigators in visual patterns recognition, Artificial Neural Networking and related disciplines. The document also describes MemBrain application environment as a powerful and easy to use neural networks' editor and simulator supporting ANN.

• Wawer R., Olesiuk D., *The space of the former concentration camp at Majdanek as a museum exhibit and object of an eye-tracking analyses*, [in:] *History in the Museum. Forms and Means of Presentation*, Leon Wyczółkowski Regional Museum in Bydgoszcz, Bydgoszcz 2013 (pp. 87–101) [ISSN 2353-1924]

Learning about the history of the place involves the risk of distorting perception and attention of visitors through the strong visual impact of items not related with the historic place which can attract or distract attention. Some of them are safety system devices, others constitute a natural item of the museum's collection and form a narrative layer of the exhibition. All of them, for various reasons, are elements which are crucial for the efficient and safe functioning of the museum institution. Their impact on visitors is unquestionable. However, the impact on the disorder of historical space perception has not been studied yet. The text constitutes an attempt to answer this question. The results of the performed experimental research reveal unknown relations appearing in an authentic historical space.

• Wawer R., Pakuła M., *Education of professional foster families in Poland*, [in:] EDUCATION – TECHNOLOGY – COMPUTER SCIENCE, No. 4/2013/Part 1, *Selected problems of technical and vocational education*, University of Rzeszów, 2013 (pp. 219–225) [ISSN 2080-9069].

The institution of foster families has existed for a long time, but only the last two decades exemplify a conscious choice of candidates for carers, and a statutory obligation to undergo the training was introduced in Poland in 2001. The article describes the PRIDE programme – foster family/adoption – in the context of its usefulness in solving the most specific problems faced by foster families. PRIDE programme is recognized, appreciated and used in many countries to prepare individuals to act as foster carers.

• Wawer R., Pakuła M., *Vocational training of foster families in the historical context*, [in:] EDUCATION – TECHNOLOGY – COMPUTER SCIENCE, No. 4/2013/Part 1, *Selected problems of technical and vocational education*, University of Rzeszów, 2013 (pp. 226–233) [ISSN 2080-9069].

In the process of education of orphaned children, or those deprived of proper care from parents, foster families play an important role for many years. The evolution of this form of childcare concerns – first of all – its legal empowerment and the preparation and qualifications of candidates for foster parents. The article presents the changes that have been introduced by further legislations in terms of competence requirements of foster parents and their professional preparation.

• Czerski W., Wawer R., *Digital school – a chance or a threat for education?* [in:] Piecuch A., Furmanek W. (eds.), Didactics of IT, University of Rzeszów, 2014 (pp. 104–113) [ISSN: 2083-3156].

The article addresses the issue of the pilot government programme "Digital School" which has been implemented since the school year of 2012/2013. Its future implementation will depend on its success. Therefore, the education system has received an opportunity to improve and fully adapt to the requirements of the information society. In the first part, the authors describe the general objectives of the programme, whereas the second part presents the issue of an e-book and risks which may result from its improper use.

• Wawer R., Czerski W., *Relations between information technologies and neuroesthetics. Eye-tracking verification of non-existent images – preparation of research*, [in:] Piecuch A., Furmanek W. (eds.), Didactics of IT, University of Rzeszów, 2014 (pp. 222–234) [ISSN: 2083-3156].

The sense of sight enables us to learn the structure of the environment, to recognize faces, objects, events, that is why the perception is combined with vision. Any visual message triggers the imagination. This mechanism works when a visual stimulus demonstrates the features of a work of art. Then, another perceptual sensitivity occurs, and an interesting question arises: is it possible to see the pictures without receiving any external stimuli? Sleep is one of such processes. During sleep, phantoms occur – hallucinations, called "alleged perception". They cause the real impressions, although the eyes did not participate in them. Non-existent reality is created in the brain. The text constitutes an attempt to answer the question: is it possible to see non-existent images without falling asleep?

• Czerski W., Wawer R., Popko A., *Educational applications of 3D printers*, [in:] Walat W., Lib W. (eds.), EDUCATION – TECHNOLOGY – COMPUTER SCIENCE, No. 2(12) 2015, University of Rzeszów, 2015 (pp. 105–111) [ISSN 2080-9069].

The article discusses the use of 3D printers in the educational process. First, there was presented a brief history of 3D printing. Another part is devoted to the discussion of selected techniques applied in these devices. There were presented only those techniques which the authors found the most interesting in terms of their application in education. The last part is devoted to the presentation of educational fields in which a 3D printer can be successfully applied.

• Wawer R., Czerski W., Popko A., *Eye-tracking diagnosis of sensual perception model on the example of road collision research. Education for safety*, [in:] Scientific and Methodological Review, Year IX No. 2/2016 (31), University of Security in Poznań, 2016 (pp. 291–321) [ISNN 1899-3524].

The objective is to present practical use of eye-tracking research in the analysis of visual perception. The first part presents the theoretical basis relating to visual perception and processing of information by humans. The second part was devoted to presenting the eye-tracking research results, which aimed to analyze the perception of images of traffic accidents.

• Wawer R., *Howard Gardner, Multiple Intelligences. New Horizons in Theory and Practice* (review), [in:] Didactics of IT, vol. 21 (2017), University of Rzeszów, 2017 (pp. 258–261) [ISSN 2083-3156].

In modern pedagogy, research explorations and research problems indicate that no human being can be educated in a versatile way. The above-mentioned question has been raised in the unusual book by Howard Gardner, *Multiple Intelligences. New Horizons in Theory and Practice*. Discussing this publication seems slightly belated, but I think it is never too late to remind those who deal with the pedagogical conditioning of the educational process, as well as all teachers of today's platitudes that every human being has all kinds of intelligence, developed to

varying degrees. Currently, this knowledge is common, at least in the pedagogical environment, but if at least one teacher would know nothing about the issue, it is worth writing about it.

• Romanek-Kowaluk M., Wawer R., *Visual perception in the study of children with specific learning disorders*, part 1, [in:] EDUCATION – TECHNOLOGY – COMPUTER SCIENCE, University of Rzeszów, 2017 (pp. 176–183) [ISSN 2080-9096] [ISSN 2450-9221, online].

Difficulties in learning are still an unresolved mystery, a fascinating, open exploration field. The article contains basic information about them: terminological considerations, causes and symptoms. Reference has been made to the latest medical classifications. Next, the study on visual processes in dyslexic patients is presented. The large variety of visual deficits recognized in children with specific learning disorders and the differences in explaining them mean that the theories lack of precise information on how visual deficits contribute to dyslexic difficulties. The text presents the most promising concepts on the subject. The paper constitutes an introduction to the eye-tracking verification tests of visual processes in children with specific learning difficulties, which were described in the next article.

• Wawer R., Romanek-Kowaluk M., *Visual perception in the study of children with specific learning disorders*, part 2, [in:] EDUCATION – TECHNOLOGY – COMPUTER SCIENCE, University of Rzeszów, 2017 (pp. 184–191) [ISSN 2080-9096] [ISSN 2450-9221, online].

The way of creating and functioning of visual information is a phenomenon which is not fully understood. In the studies on the verification of visual processes in children with specific learning difficulties and their peers without this disorder, the eye-tracking technique was used. Obtained perceptual data are independent of the memory and mood of the examined person. The article presents a verification analysis of the perception of children's image titled "Family". The text constitutes the continuation of the publication on the visual processes in people with specific learning disabilities, which has been published in this journal.

• Wawer R., Romanek-Kowaluk M., *Images and their functions in the research process*, [in:] EDUCATION – TECHNOLOGY – COMPUTER SCIENCE, University of Rzeszów, 2018, No. 4/25 (pp….) [ISSN 2080-9069].

The most sensual way of perceiving reality is vision. Image, representation and the ability to see are ubiquitous features of the process, thanks to which most people learn about the surrounding world. Within the last few decades, we have observed unprecedented saturation with visual representations. The implication of such a state is constant interaction with the world mainly through the use of images. The term "ocularcentrism", introduced in the literature on the subject, is attributed to conceptual connotations for the central position of the visual sphere.

• Wawer R., Romanek-Kowaluk M., *Eye-tracking verification study of reading process in children at risk of dyslexia*, [in:] *Problems of Contemporary Education*, University of Gdańsk, 2019.

Reading skill is necessary in order to fully participate in social life. It creates the opportunities for one's communication and self-improvement. Reading consists in deciphering the printed code and understanding its meaning. Reading literacy and learning to read is sometimes vitiated by specific learning disabilities, which in practice are called *dyslexia*. Typical symptoms of dyslexia are, among others, worse reading technique, slow reading, numerous pauses and inclusions, disturbances in keeping the direction of reading from left to right, missing letters, syllables, words, adding letters and syllables, etc. The text describes the procedure for assessing the reading ability in dyslexic children using an eye-tracking technique. In the conducted verification studies, it was noticed that the intensity of difficulties associated with the ability to read does not have to be proportional to abnormal movements of the human eye (e.g. severely reduced reading skills with minor abnormal movements of the human eye).

5. Delivery of lectures at international or national thematic conferences – selected subject matters

• The National Scientific Conference "Around Photography", Media Education Laboratory of the Institute of Polish Philology, Pedagogical University in Kraków, 17–18 November 2010.
• The Scientific Conference entitled "The history in the museum. Forms and tools of presentation", 15–17 September 2011, the Leon Wyczółkowski Regional Museum in Bydgoszcz.
• The International Scientific Conference "XXIII DIDMATTECH", Jedlnia-Letnisko nearby Radom, 13–14 September 2010.

- The First International Interdisciplinary Scientific Conference "The Space of Culture and Visual Education", Kazimierz Dolny, 22–23 September 2014.
- XIV International Scientific Conference "Education of the 21stCentury", Szczyrk, 19–21 October 2016.
- IX Interdisciplinary Scientific Conference "Interdisciplinarity as the key to development", "Tygiel", Lublin 2017.
- The 3rd National Scientific Conference from the series: "Child – a digital native at school. Problems and challenges", March 17, 2018. Faculty of Social Sciences of the University of Warmia and Mazury in Olsztyn.
- 3rd National Scientific Conference Cyber + Media TYGIEL Lublin December 2018 (member of the scientific conference committee).

6. Participation in international or national conferences

- The 3rd International Scientific Conference "Information technology in the twenty-first century. Software technologies in science, technology and education", Radom, 1–3 June 2009.
- The 3rd National Scientific Conference "Information technologies in the teacher's workshop", Kraków, 22–23 April 2010.
- The 20th Jubilee National Scientific Symposium "Man – Media – Education", Kraków, 24–25 September 2010.
- The 9th International Scientific Conference "Education – Technology – Computer Science", Przemyśl, 20–21 September 2011.
- The Conference "Knowledge and communication in innovative organizations. The electronic communication", Faculty of Informatics and Communication at the University of Economics in Katowice, 24 January 2011.
- The 5th International Scientific Conference "Information technology in the 21st century. Science, technology, education and the modern information technologies", Jedlnia-Letnisko nearby Radom, 2–3 June 2011.
- The National Scientific Conference "Contemporary dilemmas of pedagogy. Theory and Practice", Lublin, 19–20 November 2013.
- The 11th International Scientific Conference "Education – Technology – Computer Science", Przemyśl, 17–18 September 2013.
- The 3rd Euroregional Scientific Conference "Contemporary challenges of intellectual property law – between theory and practice", Rzeszów, 16 January 2014.
- The 13th International Scientific Conference "Education – Technology – Computer Science", Rzeszów, 22–23 September 2015.
- The 3rd International Scientific Conference "Universalism of human work. Work as a determinant of human existence", 24–25 May 2018
- The 10th Scientific Conference "Media *vs*. education. Human as a mediacreator", Poznań, 17–18 September 2018
- The National Scientific Conference "Interdisciplinary Contexts of Contemporary Pedagogy and Psychology". UMCS Lublin, 25–26 October 2018.

7. Membership in international or national organizations or associations

• Member of the Polish Scientific Film Association since 1997, the "Golden Badge".
• Corresponding Member of Lublin Scientific Society since December 18, 2014 (Annex).
• Polish Society of Technology and Educational Media since June 17, 2016.

8. Teaching and promoting science in the period after obtaining PhD

<u>Lectures</u>: media pedagogy; human visual perception; media in education of people with intellectual disabilities; media in education of socially maladjusted people; eye-tracking research methodology; methodology of technical education; protection of intellectual property

<u>Classes</u>: media education; media communication; information technology; screenings

• I have promoted 21 Master's theses within Master's Degree seminars.
• I actively participate in the annual "Festival of Science" organized by the Maria Curie-Skłodowska University in Lublin.
• I also participate in the cooperation program with secondary schools ("UMCS Partner Schools" of the Maria Curie-Skłodowska University). The program offers substantive and organizational care for schools as well as the

opportunity for students and teachers to participate in specially organized presentations, workshops, trainings and scientific meetings.

9. Scientific and auxiliary supervisorship of PhD students including the titles of doctoral dissertations

• In accordance with the resolution of the Council of the Faculty of Pedagogy and Psychology of September 12, 2013, I was appointed as an auxiliary supervisor for the PhD dissertation prepared by mgr Wojciech Czerski. Dissertation title: *The level of preparedness of teachers to use modern information and communication technologies* (Annex).

• Scientific supervisorship of doctoral candidate (Visegrad Scholarship), mgr Sergii Galetskiyi, Department of Business Communication of the National University of Ostroh Academy. A scholarship recipient Sergii Galetskiyi stays at the University of Maria Curie-Skłodowska in the period October 2018–July 2019 (Annex).

10. Internships in foreign and domestic scientific or academic centers

Foreign scientific internship at the Ivan Franko State Pedagogical University in Drohobych, Ukraine, 1–21 December 2014 (Annex).

11. Reviews

• Reviews for the Scientific Papers of the Witelon State University of Applied Sciences in Legnica ISSN: 1896-8333, e: ISSN 2449-9013. In the list of scientific magazines of the Ministry of Science and Higher Education in 2016, Scientific Papers of the Witelon State University of Applied Sciences in Legnica were placed in part B in item 2121 and for publication in these Papers, 7 points are obtained. The list of reviewers is available at: www.zn.pwsz.legnica.edu.pl/zalaczniki/zeszyty/zn21/wykaz_recenzentow_2016.doc

• Reviews for the Foundation for the Promotion of Science and Development, "Tygiel". Available at: https://depot.ceon.pl/bitstream/handle/123456789/15688/Media_spolecznosciowe_a_ksztaltowanie_bezpieczenstwa_panstwa_Bielawski_Ziolkowska.pdf?sequence=1&isAllowed=y (Annex).

12. Expert activities

• NCRD (the National Centre for Research and Development) expert in the Smart Growth Operational Program (IDOP) for the years 2014–2020 (item in database No. 3156). The list includes persons who took part in the recruitment of candidates for NCRD experts at SGOP, fulfilled certain formal requirements, and obtained approval from the NCRD Directorate (Annex), https://www.ncbr.gov.pl/fileadmin/Eksperci/zal._2_wykaz_kandydatow_na_ekspertow_NCBR_w_POIR 27.09 .2018_.PDF
• Media Experts' Center of UMCS – Faculty of Pedagogy and Psychology.

13. Training within EU funds

• Regional Contact Point for EU Research Programs. Training "A well-prepared application as the key to success in the Horizon 2020 programme" 2017 (Annex).
• Regional Contact Point for EU Research Programs. Training "Development of a scientific career based on short-term training trips funded by the EC" 2017 (Annex).
• European Fund. Academic Staff of the Future. Training "Innovative methods of data presentation". Certificate No. 2017/P-P/75 (Annex).
• European Fund. Academic Staff of the Future. Training "Management of scientific information as the component of information competences". Certificate No. 8/AKP/2017 (Annex).
• European Fund. Academic Staff of the Future. Training "Learning-by-doing, i.e. active teaching methods". Certificate No. 2017/ L-B-D /75 (Annex).