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## THE INTERACTIVE WHITEBOARD IN WORKING WITH LEARNERS. UNCONDITIONAL LOVE, OR A RESULT OF SPECIFIC ACTIONS?

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### ABSTRACT

The number of articles, books, and film documentaries reporting on lessons taught using a multimedia whiteboard is growing year by year. Numerous photographs and recordings show happy faces of children and their teachers. Also, test reports leave no doubt as to the attractiveness of activities supported by this modern media tool. But do all learners approve of learning with an interactive whiteboard? What determines the level of acceptance? I tried to obtain the answer to these questions in the course of research conducted in primary education classrooms as part of grant 495-NP.

### Key words:

interactive whiteboards, acceptance of interactive tools, interactive learning, primary school, research results

### 1. Introduction

The first interactive whiteboards were introduced to schools at the beginning of the 1990s. Initially, they featured American and British facilities, a little later they

arrived in the European market. Now, they are rapidly being introduced into our country's primary schools<sup>1</sup>.

The process of equipping grades I to III with interactive whiteboards in the Kujawsko-Pomorskie Province started in 2009 and lasted until June 2011<sup>2</sup>. At that time, 699 primary schools, including 1100 first grade classes, 1091 second grade classes and 1102 third grade classes were supplied with interactive sets<sup>3</sup>. Similar activities are also taking place in other provinces of our country.

Installing interactive whiteboards in schools was accompanied by free training courses designed for early education teachers. In line with the assumption of the "Key to learning"<sup>4</sup>, the purpose of equipping classrooms with interactive whiteboards was to give a fuller and more detailed presentation of data and images needed for the teacher to conduct an interesting presentation. In addition to more attractive activities, the consequence of the inclusion of a multimedia whiteboard in the course of the lesson was to improve learning outcomes, as well as children's increased motivation to learn.

## 2. A learner working with a multimedia whiteboard in the light of empirical research

Numerous statements of teachers who every day work with an interactive whiteboard confirm the attractiveness of activities supported by modern technologies. In their words, the learners accept the presence of educational multimedia tools in the classroom. They use the whiteboard without much trouble: they draw, solve problems, do interactive exercises, play games, and surf the Internet<sup>5</sup>. Krystyna Górecka notes that the inclusion of the interactive whiteboard in lessons, makes learners begin to demonstrate greater activeness and interest, aroused both by the

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<sup>1</sup> K. Majewska, *Tablica interaktywna w procesie nauczania* [Interactive Whiteboard in the Learning Process], "Wychowanie na co dzień" [Commonplace Education] 2011, No. 6, p. 28, 29.

<sup>2</sup> K. Majewska, *Lekcja bez tajemnic, czyli jak uniknąć podstawowych problemów w pracy z tablicą interaktywną* [Lesson without Secrets, or How to Avoid Basic Problems in Working with an Interactive Whiteboard], "45 Minut" [45 Minutes] 2011, No. 64, pp. 38–40.

<sup>3</sup> Krzemińska B., *Tablice interaktywne dla szkół podstawowych* [Interactive Whiteboards for Primary Schools], Kujawsko-Pomorskie, [http://www.kujawsko-pomorskie.pl/index.php?option=com\\_content&task=view&id=13920&Itemid=126](http://www.kujawsko-pomorskie.pl/index.php?option=com_content&task=view&id=13920&Itemid=126), [Access date: 07.06.2012].

<sup>4</sup> Ibidem.

<sup>5</sup> *Rozmowa z Dorotą Gebhardt o interaktywnych urządzeniach* [Interview with Dorothy Gebhardt about Interactive Devices], Interactive Solution for Education, <http://www.interaktywne.eu/index.php?modul=news&akcja=pokaz&id=36>, [Access date: 06.06.2012].

topic of the lesson, and by the device supporting it. These words are confirmed by the following learners' statements:

**Marta:** "I believe that lessons with the interactive whiteboard are very interesting. In the beginning I was not sure whether I knew how to use such a 'device', but when I went to the whiteboard, it turned out to be easy. It would be nice if such whiteboards were available in all classrooms."

**Bartosz:** "Learning is fun with the interactive whiteboard. It is easy to use. We used it in our Polish lesson and I really enjoyed it. I prefer modern classes to traditional ones."

**Mateusz:** "Lessons with an interactive whiteboard are interesting and exciting."<sup>6</sup>

Learners' increased motivation to work with an interactive whiteboard is also noted by Schmid who, in one of his articles (a report of qualitative research), says that children are not only more willing to participate in lessons, but also more often engage in their course<sup>7</sup>. Their activity, interest in the subject, as well as active participation in solving tasks and problems increases. According to the author, conclusions from interviews and questionnaires are confirmed by the following statement: "lessons are more interesting with an interactive whiteboard" and "learning gives a lot of fun"<sup>8</sup>. Importantly, the attitudes to a subject change. An image friendly to the eye, sound, movement, a possibility of direct contact with the object of teaching, do not only attract the attention of learners, but also, to a large extent, involve them in the course of classes, which can be proved by the words: "even if I was not at the whiteboard, I felt that I could interact with it. When I observe others working with the board, I'm still learning ... I can see the mistakes made by others." Excitement in a lesson taught with an interactive whiteboard becomes so large that learners feel regret when they cannot personally come to it and solve the problem presented to them<sup>9</sup>.

In addition to delight, the presence of a multimedia whiteboard in the classroom may also cause diametrically varied emotions: fear of new technology, dis-

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<sup>6</sup> K. Górecka, *Tablica interaktywna w Szkole Podstawowej numer 1 w Choszczynie* [Interactive Whiteboard in Primary School Number 1 in Choszczno] [in:] *Pedagogika informacyjna: media w teorii i praktyce edukacyjnej* [Pedagogy of Information: Media in Educational Theory and Practice], E. Perzycka (ed.), Szczecin 2010, p. 585.

<sup>7</sup> C.E. Schmid, *Potential Pedagogical Benefits and Drawbacks of Multimedia Use in the English Language Classroom Equipped with Interactive Whiteboard Technology*, "Computers and Education" 2008, Vol. 51, No. 4, pp. 1553–1568.

<sup>8</sup> V. Quashie, *How Interactive is the Interactive Whiteboard?*, "Mathematics Teaching" 2009, Vol. 214, pp. 33–34.

<sup>9</sup> *Ibidem*, pp. 34–38.

couragement due to technical failure, and boredom induced by ineffective attempts to incorporate an interactive tool into the course of the lesson.

**Monika:** “The only drawback of this board is that you must keep this ‘pen’ perpendicular and it doesn’t work for me”<sup>10</sup>

Sometimes the board is stuck and we cannot work on it.

Speakers do not work.

Lessons are similar to those we had last year, with a traditional board.”<sup>11</sup>

Unfortunately, the courses offered as part of the training “The key to learning” did not prepare teachers for the holistic operation of the interactive whiteboard. Many educational institutions have not taken advantage of the opportunity to participate in free workshops, involving their employees only in a five hours’ training course delivered by the company – SMART providing interactive whiteboards. The consequence of gross gaps in knowledge is a poor quality of work with the multimedia whiteboard. Teachers are often unaware of the opportunities offered by the whiteboard software. They do not use ready-made applications for the preparation of interactive exercises. This fact, of which they are often unaware, does not cause discouragement in the equipment. The lack of basic knowledge of operating the tool turns out to be a real demotivator. Accidental failure of the shelf–whiteboard, whiteboard–overhead projector, overhead projector–computer connection, emerging problems with sound, often contribute to a complete paralysis of a lesson. Another adversity is the lack of suitably qualified staff (IT specialist – conservator), capable of coping with technical problems occurring during a lesson. Consequently, the existence of a problem involves the notification of the company responsible for the sales and maintenance of equipment. The time for repair, depending on the damage, may last from a few to a dozen days.

These factors, although making work with an interactive whiteboard difficult, do not discourage large groups of learners. Interviews conducted among 133 people showed that regardless of the level of interactivity supported by a multimedia whiteboard, lessons (as well as the tool itself) are accepted by 94% of children<sup>12</sup>.

The attractiveness of learning with a multimedia whiteboard is of great importance for the positive reception of new forms of work. For a large part of the learners in grades I–III this means a possibility of writing with a colour marker, insertion of patterns, watching videos, playing games, etc. The research carried out by Małgorzata Nodzyńska shows that 32% of learners consider courses conducted

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<sup>10</sup> K. Górecka, *op.cit.*, p. 585.

<sup>11</sup> Observations of students, recorded during an interview conducted in grades I–III.

<sup>12</sup> Based on own research.

using an interactive whiteboard to be much more attractive, while 60% consider them more attractive, compared to traditional lessons<sup>13</sup>. It can be concluded from the observations conducted by Hanna Gulińska that the use of an interactive whiteboard “activates learning by observation, action, feeling, and thinking. The learners subjected to research have shown great commitment in all activities offered in the classroom...”<sup>14</sup>. Similar sentiments are shared by early education teachers in numerous interviews<sup>15</sup>.

The attractiveness of activities supported by a multimedia whiteboard is reflected in the high level of involvement in the lesson, which in turn translates into children’s level of knowledge and learning outcomes. Good grades, being a kind of gratification for work, motivate learning and raise the degree of acceptance for a multimedia whiteboard in the classroom.

During the surveys conducted by Quashie, learners reported that, owing to the presence of interactive whiteboards in the classroom, they have the opportunity to better understand the subject and the presented problems. They justified their assessment by the ability to analyse images more exactly and to identify incomprehensible elements, which would not be possible if working with a normal whiteboard. The opportunity to interact with learning material was also essential. During the survey and interview young people pointed out that:

- “the interactive whiteboard makes lessons simpler”,
- “the whiteboard makes it easy to interact with the object of learning”,
- “the tool is easy to operate”.

Analyzing the words and the results of learners’ surveys, one may be tempted to argue that the use of the interactive whiteboard can help learners to understand a presented problem (about 60% said that the IWB definitely helps, while about 35% said that it helps)<sup>16</sup>. The declared ease of the use of and learning with a multimedia whiteboard is often confirmed by the results of the teaching of school subjects, among others Mathematics, Physics, Chemistry, Polish and Foreign Languages, Natural Science, etc.

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<sup>13</sup> M. Nodzyńska, *Wyniki badań nad atrakcyjnością zajęć prowadzonych przy zastosowaniu tablicy interaktywnej* [Research Results on Attractiveness of Classes Taught Using the Interactive Whiteboard] [in:] *Wykorzystanie technologii informatycznych w akademickiej dydaktyce chemii* [Use of Information Technology in the Academic Teaching of Chemistry], I. Maciejowska, M. Ruzsak, S. Witkowski (eds.), Kraków 2007, p. 75.

<sup>14</sup> H. Gulińska, *Płyta CD-ROM jako element podręcznika chemii* [The CD-ROM as Part of a Chemistry Textbook], Uniwersytet Pedagogiczny im. Komisji Edukacji Narodowej w Krakowie, p. 7, <http://www.up.krakow.pl/ktme/ref2006/Gulinska.pdf>, [Access date: 10.06.2012].

<sup>15</sup> Interactive solution, op.cit.

<sup>16</sup> C.E. Schmid, op.cit., p. 1557.

The use of the multimedia whiteboard in the teaching of science has, undoubtedly, many advantages. The main ones include: the ability to visualize a large part of the discussed issues, as well as the ease of presentation of a large number of examples with their full description in a short time. A graphic presentation of data gives teachers a real chance to present accurately: charts, three-dimensional solids, quantities of perimeters and surface areas of figures, impact of forces, chemical reactions, etc., so that the learner can gain a thorough understanding of phenomena that are difficult to imagine. No less important is the number of presented patterns. A presentation rich in examples plays an important role, especially in the first stage of the introduction of a concept, when a thorough understanding of the fundamentals ensures a smooth transition to a higher level of abstraction.

In addition to science, “the interactive whiteboard supports the teaching of foreign languages...”, which, as pointed out by Gérard and Widener, is possible owing to<sup>17</sup>:

- conducting activities supporting the learner-teacher, learner-learner conversation;
- visual presentation of the culture elements;
- audio and visual presentation of dialogues and films in a foreign language;
- preparation of exercises supporting the teacher’s work;
- preparation of exercises supporting language skills;
- activation of the learner;
- increased learner motivation.

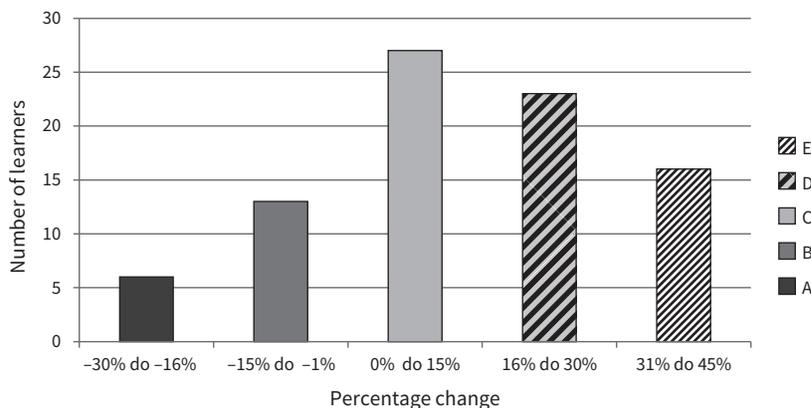
As shown by quantitative analyses, the use of the interactive whiteboard can help achieve better learning outcomes; however, it is not a determinant, much less a guarantee of an increase in learners’ knowledge. During the working out of the data obtained by means of knowledge tests, conducted in a survey in 2008 in Marzano Research Laboratory<sup>18</sup>, there were cases where the ratio of the number of points obtained in a post-test to the number of points scored in a pre-test was unfavourable (group A and B, figure 1).

Then one began to look for the factors influencing the results of teaching. On the basis of long-term observations and extensive data collected by various laboratories and research centres it was found that we can talk about multifactorial

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<sup>17</sup> Gérard F, Widener J., *A smarter Way to Teach Foreign Language: The SMART Board™ Interactive Whiteboard as a Language Learning Tool*, pp. 1–6, [http://www.swsc.org/16331056134949507/lib/16331056134949507/A\\_SMARTer\\_Way\\_to\\_Teach\\_Foreign\\_Language.pdf](http://www.swsc.org/16331056134949507/lib/16331056134949507/A_SMARTer_Way_to_Teach_Foreign_Language.pdf), [Access date: 10.11.2010].

<sup>18</sup> J.R. Marzano, M.W. Haystead, *Final Report Evaluation Study of the Effects of Promethean ActivClassroom on Student Achievement*, Bloomington 2009.



**Figure 1.** Percentage change resulting from the inclusion of the multimedia whiteboard in the course of the lesson

Source: R.J. Marzano, M.W. Haystead, 2009.

aspects of effective (ineffective) use of the multimedia whiteboard in the learning process which may be affected by:

- The age of the learner, because of the potential for graphic presentation of the material and the power of a multisensory impact.
- The experience of the teacher as regards the duration of working at school.
- The duration of operating the multimedia whiteboard and awareness of its maintenance.
- The ratio of the duration of the use of the multimedia whiteboard to the duration of the class taught in the traditional way.
- The sense of effectiveness of using the multimedia whiteboard by the teacher.

### 3. Research results and conclusions

The data for analyses were collected from May 2011 to March 2012, under grant 459-NP. The study group consisted of 133 learners from grades II–III of primary school. In the experiment children participated in three different types of classes: classes conducted in the traditional way using an ordinary whiteboard, classes conducted in the traditional way using a multimedia whiteboard, and interactive classes supported by a multimedia whiteboard. A total of 24 lessons were carried

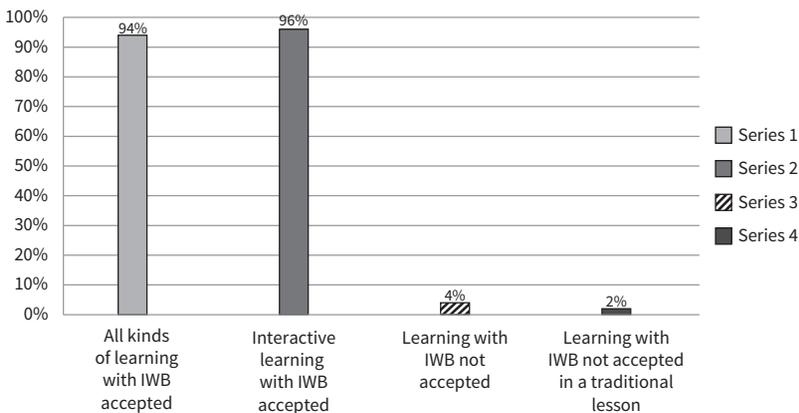
out (9 of each type), touching upon the issues of the Polish Language, Mathematics, and Natural Science.

In the experiment, learners participated in knowledge tests and interviews, whereas teachers took part in quantitative surveys and interviews. Some classes, with the head teacher’s consent, were observed by three qualified judges.

Pilot studies have shown that the learners’ activeness in traditional classes is around 15%–25%. In the case of traditional lessons conducted with a multimedia whiteboard, activeness increases to about 25%–30%. The highest activeness, approximately 85%–97%, was recorded in interactive lessons using a multimedia whiteboard. These results were confirmed during the research proper.

While interactive classes with a multimedia whiteboard did not cause reservations in a group of 96% of children, the more traditional classes supported by this modern tool did. During the experiment (in traditional lessons supported by a multimedia whiteboard) the presence of a 4% group of learners was reported who did not see any advantages of using interactive whiteboards in a traditional lesson. According to these people, the lessons could be taught using an ordinary whiteboard. Four children also declared their willingness to change in the future an interactive classroom into a classroom with an ordinary whiteboard. The decision stemmed, as the learners assured, from the following reasons: working with a multimedia whiteboard causes a great deal of technical problems and the classes are similar to those of the previous year.

Based on the obtained data it can be concluded that learners accept work with an interactive whiteboard to a large extent.



**Figure 2.** Level of acceptance of work with multimedia whiteboard

Source: Author’s own study.

The research carried out so far enables me to make the following statement: the level of acceptance of work with the multimedia whiteboard, as well as teaching effectiveness, is multifactorial. Based on information gathered during observations, interviews, and informal conversations with learners, I felt able to define two basic factors which are of great importance in the context of approval of new teaching methods:

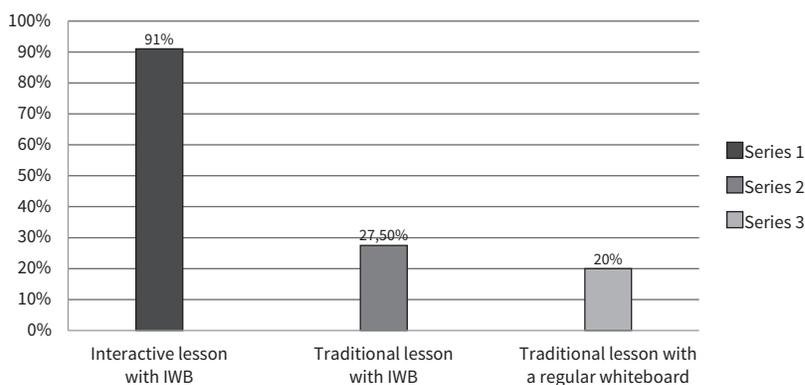
### 1. The manner of using the board by the teacher

It should be interactive, allowing a direct contact with the teaching material. Films, images, and multimedia presentations included in the course of a lesson not only stimulate interest, but also provide a better transfer of knowledge. Extremely important are the sounds and graphic signs confirming the correctness or incorrectness of the presented solutions.

### 2. Technical problems occurring during a lesson

Technical problems occurring during a lesson, which are often beyond the teacher's knowledge, discourage learners from work with the multimedia whiteboard. In many schools the interactive whiteboard is the only board in the classroom, therefore, any problems and damage prevent the learners from making notes common and visible to all, which raises not only their anger, but also discouragement.

During the classes there were various levels of learners' activeness. The greatest occurred during interactive classes, which may indicate a greater interest and, consequently, a higher level of acceptance. The lowest activeness characterized traditional lessons.



**Figure 3.** average level of activeness in a lesson

Source: Author's own study.

In my belief, the result of many hours of observation of the behaviour and of analysis of learners' utterances, one cannot speak of unconditional acceptance of working with the multimedia whiteboard, or love for the tool. The presence of a group of learners of a few percent who challenge the traditional nature of learning with an interactive whiteboard may testify to the occurrence of expectations of specific actions. The number of children for whom a colour pen, or a single image presented in the classroom do not suffice, will increase over time.

According to the assumptions, the multimedia whiteboard was intended to support, motivate, and facilitate the understanding of issues difficult to imagine. Deeper knowledge and, consequently, higher educational outcomes were to be the results of its inclusion in the lesson. Unfortunately, as practice shows, the mere presence of a multimedia whiteboard in the classroom will not suffice. Essential is a correct, interactive message that will not only fully involve children, but also enable them to benefit from the capabilities of this comprehensive multimedia tool.

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