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“Edubal” Educational Balls: I Learn While Playing!

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Abstract

This study aimed to summarize the results of a 10-year research study on the effects of using educational balls, “Edubals,” during physical education classes with pupils attending Grades 1 to 3 of the primary school (i.e., children aged 7 to 10). Our research was conducted in Poland and Germany. Another purpose of our study was to present the possibilities of using exercises, play, and games with Edubals. The authors focused their attention upon objectives and tasks of the contemporary education of children aged 7 to 10. They are involved in supporting and stimulating the comprehensive development of children, especially in respect to motor abilities and, in particular, coordination skills that determine, reading and writing skills, among others. Use of Edubals in integrated education (Grades 1 to 3 of the primary school) activates a cognitive, emotional, and physical sphere of a child and also contributes to the integration beyond the scope of the subject content. The children, while participating in physical education classes with the use of educational balls, learn more about letters, spelling rules, and mathematical and punctuation signs, as well as many other principles connected with language and mathematical education. In addition to this, they shape their motor abilities and improve their physical skills.

Keywords: Education of children aged 7 to 10, physical education classes, Edubal educational ball

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Introduction

Reforms of the Polish education system that were introduced in 1999 and 2009 brought about enormous changes in the educational process for Grades 1 to 3 of the primary school. In particular, the New School Curriculum Basis of 2009 specially emphasized an innovative approach to the concept of integrating early school education with physical education (PE). This document provided teachers with the possibilities of time planning according to the child’s needs, of showing his or her creativity in combining mobile activity with other school classes, of knowledge transfer by experience, of teaching by playing, of supporting each child in the process of holistic learning about the world, and so forth. As a response to these proposed changes, as early 2002 in the Faculty of Team Sports Games, Wroclaw University School of Physical Education, the idea of “Edubal” educational balls was born.

Edubal Educational Balls

Because students are interested in mobile activity and the attractiveness of exercises, play, and games with the ball, modifications in traditional balls were introduced by placing on them letters of the alphabet, numbers, and signs (Rokita, 2000, 2001). In this way, educational balls, called Edubals, were created. There are 94 balls for mini-team games (basketball, football, volleyball, handball) in four colors with letters of the alphabet painted on each ball (capital and small letters) and with numbers from 1 to 9, as well as mathematical signs (adding, subtracting, multiplying, dividing) and an electronic mail sign, @ (Rzepe & Rokita, 2002).

Edubals received acceptance and approval from the Ministry of National Education and Sport. A set of Edubals was entered in the ofcial list of didactic aids for use in schools and designated for general and integrated education at the level of the primary school (order number: 1566/2003 – on the basis of ordinance of the Ministry of National Education and Sport – Diary Acts of 2002, No. 69, item 635). Edubals were also given a positive recommendation from the Parliament Commission for Sport.

Numbers, letters, and signs, as well as colors of the educational balls, make their use extensively possible in almost all sciences that are comprised in school curricula bases. They facilitate the process of gaining teaching experience by searching and creating new solutions aimed at more effective accomplishment of various educational objectives (Rokita & Rzepa, 2002 2005? add new ref?). The authors enumerate many possibilities of using the balls in education while teaching Polish, foreign languages, mathematics, computer science, history, and so on. They also recommend their employment in higher grades, to teach intrasubject classes, to make PE lessons more attractive, and to provide a student with possibilities to reinforce knowledge in other school subjects. Within the literature of the subject, numerous monographs were written containing descriptions of exercises, play, and games with the use of educational balls (sets of exercises, play and games, topic scenarios, and lesson plans).

Pedagogical Studies and Edubals

Since Edubals came into existence, many pedagogical research studies have been conducted aimed at determining the effects of PE classes conducted with these balls. Within the body of this research, scientists have conducted studies connected with Wroclaw University School of Physical Education.
Since 2002, some pilot research has been conducted (Cichy & Rzepa, 2005; Rzepa, 2003), as well as proper research (Cichy, 2008; Cichy, 2010 add ref; Cichy & Popowczak, 2009; Krajewski, 2007; Rokita, 2007a, 2007b; Rokita, 2008; Rokita & Kaczmarczyk, 2011; Rokita & Krysmann, 2011; Rokita, Malska–Śmiałowska, & Babińczuk, 2007; Rzepa & Wójcik, 2007a, 2007b) with regard to the use of Edubals in kindergarten and early school stages of education, which gave promising results. The research referred to the assessment of effects of introducing Edubals into PE classes (in the scope of physical fitness and chosen didactic abilities).

Cichy and Rzepa (2005), in their yearlong pedagogical experiment with the use of parallel group technique, noticed that a teaching program that accounts for educational balls influences the development of the motor sphere to the same degree as a traditional program in Grades 1 to 3 of the primary school. Krajewski (2007) drew similar conclusions; however, his research was concerned with 6-year-old children attending the kindergarten zero groups. He indicated considerable advantages of conducting a 6-month nonconventional program (with the use of educational balls, yoga, relaxation, and cloth games) over the effects of a traditional program for psychomotor development of children. After conducting an experiment with the use of Edubals, Cichy (2010) obtained similar research results. The employment of Edubals during PE classes does not bring about unfavorable changes in the scope of physical fitness; on the contrary, it improves results of general body coordination (Cichy, 2010; Cichy & Popowczak, 2009). It is a specific character of ball play and games that is more important for the development of a child’s coordination than for other constituents of physical fitness that are conditioned by biological development (speed and strength). Many other authors have confirmed this. According to Pawłucki (1984) and Wójcik-Gryb (2005), the development of coordination abilities is directly connected with the speed of learning to read and write. In regard to intellectual abilities, we must admit that the research results conducted within the framework of grant KBN No 2PO5D058 (2004–2007) indicate that the employment of Edubals in integrated education brought about significant changes in reading skills in the experimental group as compared to the control group (independent of the environment city/village; Rokita, 2008, p. 74). In their studies, Rzepa (2003), Cichy and Rzepa (2005), Rzepa and Wójcik (2007 a or b or both?), and Rokita (2008) confirmed the existence of connections between the use Edubals in integrated education and the intellectual development of students.

Use of Edubals in early education (linguistic, mathematical) constitutes the topic of subsequent research studies. In the Faculty of Team Sports Games under the supervision of Professor Andrzej Rokita, the subsequent areas of the child’s psychomotor development that often condition the process of acquisition of didactic competences have been examined. Problems such as dyslexia, dysgraphia, and spatial orientation have been discussed. In the Faculty of Team Sports Games, two doctoral dissertations connected with the use of Edubals in Grades 1 to 3 of the primary school have been written.

The Faculty of Team Sports Games has also studied the intensity of PE classes with the use of Edubals in relation to traditional PE classes. The results obtained shall be used to correct problems in the programs of these classes in order to optimize the teaching process. This research has shown that heart rate levels change during effort due to the classes.

The originators of the innovative method, Rokita and Rzepa (2005), in one of their first studies, suggested that “exercises, play, and games with the educational balls can be used in working with integrative groups in which the ball becomes the greatest attraction of the class for a student” (p. 15).
When reviewing the literature of the issue in question more thoroughly, we noticed general studies whose authors employed Edubals in the process of integrating healthy children and children with disabilities in schools (Krajewski & Cichy, 2009; Pyra, 2003). The results presented by Cichy (2010) with regard to the children who have special educational needs clearly prove that their participation in conducting a nontraditional program with Edubals did not contribute to any deterioration of their results; moreover, with 50% of the subjects, it probably brought about positive changes. Although such comparisons are not usually advisable, Cichy (2010) emphasized that in some cases, the better results of the children with dysfunctions prove that differences between them and healthy children are beginning to disappear.

Considering these findings, we note this method may constitute an attractive supplement to standard classes conducted within integrated school groups. An appropriate use of Edubals in the educational or therapeutic process becomes a helpful tool in the versatile preparation of a child to social life because, through the specific character of the classes, the entire sphere of physical, mental, and social experiences is involved here (Krajewski & Cichy, 2009).

As it turns out, the area of interest in impingements of Edubals has recently become broader. Kasperska and Bialoszewski (2009) indicated these areas of rehabilitation in which the use of Edubals is possible. They emphasized the need to familiarize the students of physiotherapy with this method within the subject of movement teaching methodology. Moreover, they think that physical therapists’ work can undoubtedly be made more effective by encouraging children to make mental and physical effort and be creative, by introducing a pleasant atmosphere during classes, using praise, and adapting the way the classes are run to the children’s individual needs and possibilities.

This “new Polish method ‘edubal’ becomes a part of such renowned methods of psycho-physical rehabilitation as, for example, Paul Dennison’s Educational Kinesiology (the so called ‘brain gymnastics’), Good Start Method, Weronika Sherborn’s Developing Movement Method” (Kasperska & Bialoszewski, 2009, p. 29).

Various popular-science publications in magazines and on the Internet refer to the topics discussed in this study. Many of these elaborations (Biegań & Melasa, 2007; Kaufer-Rudak & Pyra, 2003; Kruk, 2006; Kubicka, 2006) indicate positive impingements of physical classes with the use of educational balls on the development of physical fitness. Although these reports are not always confirmed empirically, many of them point to the development of social values and accompanying ubiquitous cooperation, which can be seen during classes where the aforementioned balls are used.

The presented research results not only confirm the obvious advantages of using Edubals in kindergarten and early school education, but also prove their merits empirically. It seems necessary to conduct further research aimed at determining the connections of a child’s participation in classes where the educational balls are used with the development of its social sphere as one of the most significant indexes of functioning of man in the future.

**Conclusion**

An individually elaborated teaching program with the use of Edubals can have an interdisciplinary nature that a teacher can impinge upon the student in a holistic way. Moreover, such classes may constitute a perfect supplement to a broadly understood process of integrating children with special educational needs with healthy children. Consequently, such classes are characterized by a friendly atmosphere, build up a sense of safety, and lead to the acceptance of a child as a person who is needed by the group, and vice versa—this person needs a group, too.
These aspects accompanying the child’s education lead to an efficient and permanent process of learning by acquiring knowledge and experiences.

Long-term (over 10 years) activities connected with the use of Edubals in education resulted in a cooperation with Deutsche Sporthochschule in Köln, which in turn led to an invitation to run regular classes under the name Educational Balls “Edubal” at 30 hours during the summer term of the academic year 2010–2011 and the winter term of 2011–2012 at this prestigious German University. Moreover, because of the Deutsche Sporthochschule, a cooperation was started with an inclusive education development foundation, Gold Kraemer Stiftung Fundation. In the German town Frechen on November 15, 2011, a presentation was made of the possibilities of using educational balls during classes with persons with intellectual and physical disabilities. This presentation aroused great interest among teachers and methodologists. This cooperation provides enormous chances for introducing PE classes with educational balls into schools in Germany.

References


Wójcik-Grzyb, A. (2005). Coordination skills as a condition of speed and accuracy of learning to read and write. In R. Bartoszewicz, T. Koszyczyc, & A. Nowak (Eds.), Didactics of physical education in the light of modern educational needs (pp. 335–340). Wrocław, Poland: WTN.

**Examples of Plays With Edubals**

**Topic:** Improvement of mathematical skills with the use of Edubals

Place where classes are held: sports hall
Duration: 45 min
Teaching aids and materials: Edubals (94 pieces), 9 sashes, 4 gymnastic hoops, 2 rubber rings

1. **Meeting:** The participants are informed about the subject of the class.

2. **Running tag:** All of the participants have balls, and the participant who has the number 5 on the ball is a tag. The person who is touched by the tag exchanges his ball for the tag’s ball, and then he or she becomes the tag.

   **Interpretation:** During the game, the children must carefully observe the running persons so that they can detect the ball with number 5 on it, and consequently the tag.

3. **Friendly numbers:** The participants move around the hall dribbling the balls freely. At a signal, they try to make pairs with other participants so that the sum of the numbers that are on both balls would be the same as the number the teacher indicates.

   **Interpretation:** The teacher who conducts the game is also a referee who decides whether the task is completed correctly. In some cases, three persons could group together.

4a. **Numerical sets:** The participants are divided into two groups. Each team has sets of Edubals prepared in two hoops, and these sets must be balanced but without rearranging the balls from the existing sets; only the remaining Edubal balls scattered around the room can be used for this purpose. The winning team is the one that correctly balances the sets and makes as many shots as the sum of the Edubals in both sets.

   **Interpretation:** The teacher supervises the correctness of the task and evaluates the speed of performance. The winning team earns 2 points and the losing team earns 1 point. This scoring helps all of the participants, even those who lose, feel appreciated for their efforts.

4b. Two sets of Edubals are arranged inside the two gymnastic hoops. The task is to count the balls as quickly as possible within their sets and to use the appropriate ball with the less than (<), equal to (=), or greater than (>) sign in order to make the right comparison. Moreover, after the task is complete, the team must run around their sets twice and come back to the place of start–finish as quickly as possible.

   **Interpretation:** The teacher observes the players and tries to notice which persons have problems with comparing sets and do not want to participate in the performance of the task, and the teacher also pays particular attention to an element of cooperation, or lack of cooperation, in the group.
5. Races of rows: Participants in the same teams stand in two rows.

- At a signal from the teacher, two persons run from each row up to a certain place and they collect balls from 1–2, 3–4, 5–6, and so on.

- As above, the persons who run have in their hands the results of math operations, for example,
  - $2 + 3 =$
  - $6 + 1 =$
  - $9 - 3 =$

- **Solve a problem at a halfway point:** At a signal from the teacher, one person from each row runs up to a certain point where they try to arrange an answer to the question that is written down (e.g., the date Germany became united – 1989), using all of the educational balls for this purpose.

**Interpretation:** Races of rows, which combines skills from many subjects, enables persons who are less physically skillful to show their intellectual values, which is impossible during typical races of rows competition. Therefore, persons who are less fit and more fit need one another because they can achieve the goal only by working together.

6. In the same teams, the participants perform the last task, which consists of collecting the balls and putting them into three sacks:

- Team 1 collects yellow and blue balls.

- Team 2 collects green and red balls.

**Interpretation:** The teacher observes which persons are the most active in collecting the balls and teaching aids that are used during the class. The most active students are rewarded.

**Summary of the class, the winning team is elected.**

**Topic:** Improvement of language skills with the use of Edubals

**Place where classes are held:** sports hall

**Duration:** 45 min

**Teaching aids and materials:** Edubals (94 pieces), 10 sashes, 16 rubber rings

1. **Words, words:** Each participant has one Edubal. Moving around freely, the participants throw their balls up. At a signal from the teacher, all the participants stop and say out loud words beginning with the letter that is on the ball they are holding (e.g., the person who has the ball with the letter B might say bred, Bernard, or Barbara). After saying the word, the participant has the right to perform a throw to the basket as many times as the number of letters in the word.

**Interpretation:** This sort of task improves the ability to remember the spelling of chosen words, and at the same time, the participants improve their movement skills.
2. Improve spelling of B: The group of participants is divided into two subgroups. All of them have Edubals, but without the letter B. At a signal, the teacher gives the participants balls with B. The participants’ tasks are to create as many syllables and words containing the letter B as possible using the balls they have. After making each word or syllable, the players are supposed to return the ball overhead 10 times between each other using both hands. The team that creates more words or syllables is the winning team.

Interpretation: This sort of task improves the participants’ abilities to remember the spelling of chosen words containing the letter B, and at the same time, they improve their movement skills performed in a team.

3. Words: The game is played in the same teams. One team is asked to make and write down as many words as possible, in English, that start with the prefix “edu,” and the other team makes words that end in the suffix “ball.” The winning team is the one that makes more words than the other team within 5 min.

Interpretation: The teacher observes interactions between the participants and tries to find out which persons in the teams are their leaders or whether the participants share their tasks (i.e., one person fetches the ball, the other one writes down a word, yet another one arranges the balls into words).

4. Running tag letters K and P: The participants move around the hall dribbling the Edubals freely. The person who is the tag has a red ball. The participant who is touched by the tag can be protected against the tag if he or she says the word beginning with or containing the letters K or P. If he or she fails to do so or hesitates too long, the tag is changed.

Interpretation: The teacher can help the participants who hesitate in a discreet way so that they do not feel embarrassed and, at the same time, keep the play going.

5. Vowels and consonants: Each participant has an Edubal and moves freely around the sports hall. At a signal from the teacher, the participants pair up according to the letters they have on their balls. The person who has the ball with a consonant makes a pair with the person who has a vowel, and in this way, they create syllables. Afterward, they group into threes or fours and create short words.

Interpretation: This sort of task improves the participants’ abilities to remember consonants and vowels and to learn how to create syllables and words. They also enrich their vocabulary and improve their movement skills.

6. Favorite sport: In the same teams, the participants are asked to create and write down in English as many names of their favorite sports as possible. All members of a team, after creating each word from Edubals, have to run around a specific area designated by the teacher and dribble balls at the same time. The team that creates the most words within 5 min is the winning team.

Interpretation: The teacher is a referee in this competition, decides whether given answers are correct, and does not allow a word that was already used to be repeated. The teacher also observes cooperation within teams and monitors and corrects the way participants move around with the ball after creating each word.