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DIRECT INSTRUCTION METHOD IN LEARNING TO INCREASE STUDENT KNOWLEDGE ABOUT BOCCE SPORTS FOR CHILDREN WITH SPECIAL NEEDS: EXPERIMENTS AND BIBLIOMETRIC ANALYSIS

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Abstract

This study aimed to increase students' knowledge about bocce sports for children with special needs. This learning is delivered using the direct instruction method. Thus, educators can directly demonstrate step-by-step and students practice step-by-step as well. The method used in this research was mixed methods. A qualitative approach was used to explain the objective conditions of students' knowledge about bocce sports for children with special needs and explain the treatment given to students while a qualitative approach was used to see the increase in students' knowledge. The analysis was also completed with bibliometric analysis. The result is to increase the knowledge of students about bocce sports for children with special needs. After the treatment is finished, students can do the bocce sports by themself. This can be seen from the results of the action test during treatment and after the treatment was completed, students' knowledge increased by 88%. This report concludes that the direct instruction method can improve the student's knowledge about bocce sports for children with special needs. That matters because the direct instruction method makes sports learning easier to understand. Finally, it is practiced directly step by step. This study is expected to be a solution for teachers in increasing knowledge about sports for children with special needs, especially for students.

Keywords: Bocce, Children with special needs, Direct instruction method, Sports, Student's knowledge.

1. Introduction

The learning method is one of the most important things in learning. The selection of learning methods can affect the effectiveness of the delivery of knowledge from educators to students. One of the learning methods that can be applied in the practice of learning is the direct instruction method. The direct instruction learning model is teacher-centered, meaning that the teacher practices learning with students step by step [1].

This learning model emphasizes gradual practice. Thus, students understand the whole learning well. The direct instruction learning method is of course delivered directly, one of the activities is bocce sports activities for children with special needs.

Bocce is a handball sport similar to the blues game from France or pentaquin, this sport requires strength, stamina, speed, and agility. In addition to these abilities, this sport also requires accuracy. Thus, the ball that is thrown is close to the fixed ball. The bocce sport is a sport for everyone, age, gender, and ability.

Currently, many reports use the direct instruction method. Among them, namely, the problem-based learning model versus direct instruction in achieving critical thinking ability viewed from students' social attitude in learning physics, does direct instruction work?: A critical assessment of direct instruction research and its theoretical perspective [2], teacher-centered vs. student-centered: An examination of student teachers' perceptions about pedagogical practices at Uganda's Makerere University [1], the effectiveness of direct instruction curricula: A meta-analysis of a half-century of research [3], and teaching unison responding during small-group direct instruction to students with autism spectrum disorder who exhibit interfering behaviors [4]. But until now, there has been no research that discusses direct instruction methods in learning to increase students' knowledge about bocce sports for children with special needs.

This study aims to increase students' knowledge about bocce sports for children with special needs by using the direct instruction learning model. This study uses mixed methods with qualitative and quantitative approaches. The result of this research is an increase in student knowledge based on data during treatment and after treatment is completed. This is because the direct instruction learning model is practiced step by step. Thus, it is easy to understand and easy to apply. The conclusion is that direct instruction methods can increase the student's knowledge. Contributed to this study is the solution for designing learning for students about bocce sports for special needs children. The novelty of this study is (i) a direct instruction learning model in student knowledge about bocce sports for children with special needs, (ii) applied in sports learning, and (iii) the subject is students who will teach children with special needs.

2. Method

2.1. Research subject

The subject of this research was eight students majoring in Special Education at the Universitas Pendidikan Indonesia, Indonesia. Special education is a department that focuses on learning about children with special needs, the obstacles they experience, and their needs.

2.2. Research procedure

This research used mixed methods with qualitative and quantitative approaches. The quantitative approach was carried out with an A-B-A design. This study focused on the use of direct instruction learning models to increase student knowledge about bocce sports for children with special needs. The research flow was divided into three stages, namely (i) stage 1, (ii) stage 2, and (iii) stage 3.

Figure 1 shows three stages of research along with the activities that will be carried out in each stage. In stage 1, we observed the objective conditions of students in the field. Students' objective conditions were analysed from their weaknesses, strengths, and needs. The results of this observation become the basis for making learning programs. Then, we designed learning using the direct instruction model. In stage 2, we conducted learning using the direct instruction method. At this stage, we also assessed students' knowledge from time to time in each learning process. In the third stage, we performed data processing and analysis of data results. This stage aims to determine the changes in the level of student understanding that occur.

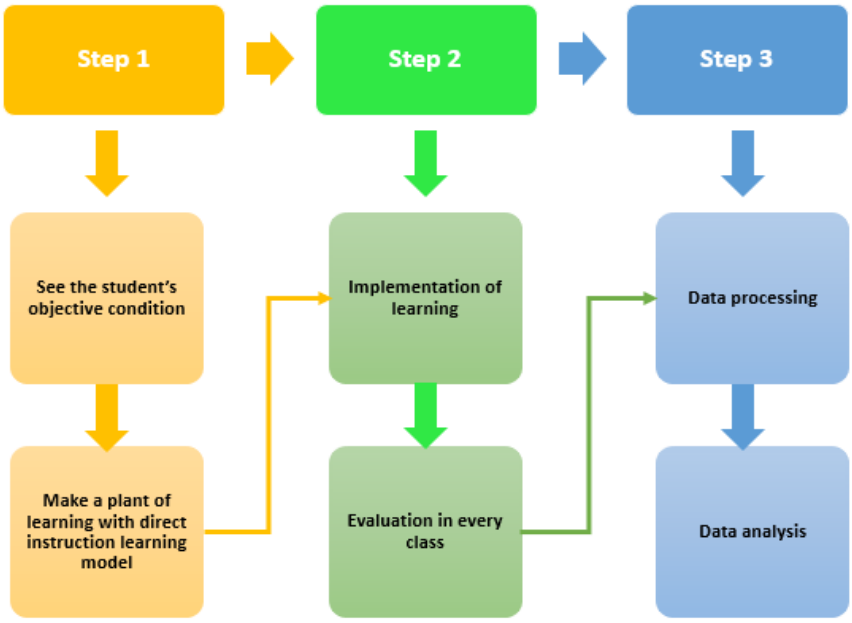

Fig. 1. Research procedure.

We used an A-B-A research design. A1 is baseline one which contains an assessment of the objective condition of student knowledge about bocce sports for children with special needs. B is a treatment that contains an assessment of every learning carried out. In condition B, the direct instruction method is implemented for students. A2 is baseline two, which contains the final evaluation after all meetings have been completed. Evaluation questions on A2 are given to determine the level of change between the evaluation scores of A1 and A2. We give the same question.

2.3. Research instrument

This study collected data through observation. We directly assessed student knowledge at each stage of the bocce exercise learning practice. There are ten stages of the bocce game to be graded. The assessment was done by scoring 0-2. a score of 0 (not able), a score of 1 (able with assistance), and a score of 2 (able). The maximum score obtained by students if they can answer all questions is 22, with a value of 100.

After getting the scores from all students, we will add them up and then calculate the average value. The average value will be the data in this study.

(i) The instrument for the stages of the bocce game is the following:
(ii) Choose the team randomly to throw the jack ball first
(iii) The position of the foot is behind the first line of the field
(iv) Throw the jack ball in front of the third line of the field
(v) If the first team fails, the second team throws a jack ball in front of the third line of the field
(vi) The team that succeeded to throw the jack ball is allowed to throw one colored ball
(vii) Another team throwing 1 colored ball too
(viii) Measure the distance between the two balls that are closest to the jack ball
(ix) The team whose ball is farther from the jack ball is allowed to throw the colored balls again 3 times until the colored balls run out
(x) Another team throw the colored balls 3 times until the colored balls runs out too
(xi) Measure the team closest to the jack to determine the winner

This observation instrument is based on the stages of the bocce game for children with special needs. There are 10 stages made, this had the aim of simplifying the assessment process and stages of data processing analysis.

Interview instruments with questions about student knowledge about bocce sports for children with special needs are in the following, consisting of five questions that are closely related to the stages of implementing the bocce sports game:

(i) What are the tools that must be prepared for bocce sports?
(ii) how do determine the winner?
(iii) How many people are on each team?
(iv) How many balls are needed in one game?
(v) Where is our body position when we throw the ball?

3. Results and Discussion

3.1. Bibliometric analysis

Bibliometrics is carried out by analysing Publish or Perish processed data which is visualized through VOSviewer. VOSviewer is a program that visualizes a bibliography or data set with bibliographical fields [5-15]. VOSViewer software can also reflect trends, effects, and the process of evolution of high-frequency topics [16]. The word bibliography comes from the Greek words "bilio" (book) and "graphies" (graphics) (writing). Consequently, a bibliography can be defined as a list of books or magazine articles, usually on a specific topic. VOSviewer is used in research for bibliometric analysis [17-19], looking for themes that can still be explored, and looking for the most widely used references in certain domains [20].

In this study, we used the VOSviewer software as a tool to assist in mapping analysis of the number of studies in the searched field according to keywords. The keywords we use are bocce sport and students with special needs. The data we are looking for starts from 2015 to 2022. The publish or perish program is used to retrieve data before the data is visualized using the VOSviewer program. This is intended to make it easier to determine the desired amount and up-to-date data.

Published research developments in Google Scholar-indexed journals regarding bocce and students with special needs. The development of bocce research and students with special needs in 2022 totaled 102, in 2021 there were 129, in 2020 there were 118, in 2019 there were 100, in 2018 there were 86, in 2017 there were 105, in 2016 there were 103, and in 2015 there were 106. The number of research developments on bocce and students with special needs tends to be stable. This can be seen from the number of studies over the past seven years showing a stable number ranging from 100 to 129. The most research is in 2021 as many as 129 research articles have been produced. This becomes the basis for whether the development of research on bocce and students with special needs can be taken into consideration for research on bocce and students with special needs to be carried out in the future. The consideration that can be made is whether the trend of research on bocce and students with special needs is still relevant or not.

The minimum number of relationships between each term in VOSviewer is two. The data is then evaluated by VOSviewer. VOSviewer results are grouped into several clusters. In this study, data were obtained from 7 cluster groups. Each cluster describes the relationship between two or more terms. Cluster 1 is represented by Red with a total of 34 items, Cluster 2 is represented by Green with a total of 26 items, Cluster 3 by Blue with a total of 24 items, Cluster 4 by Yellow with a total of 22 items, Cluster 5 is represented by Purple with a total of 18 items, Cluster 6 by Cyan with a total of 18 items, and Cluster 7 by orange with a total of 13 items.

VOSviewer has three different representations for bibliometric mappings. These representations include network visualization (Fig. 2), overlay visualization (Fig. 3), and density visualization (Fig. 4). The colored circles are labels for each keyword. The number of keywords in the title and abstract is closely related to the size of the circle. The size of each circle is closely related to the keyword frequency.

Figure 2 describes the network visualization. The results of the data analysis show that research on bocce is in cluster 1 with a relatively small number. It appears from the size of the circle that looks still small. While research on students with special needs is in cluster 5 with a relatively small number as well. The relationship between terms is depicted in Fig. 2. In the development of research on the relationship between bocce and students with special needs it turns out that the visualization analysis results have 155 items, 7 clusters, 1060 links, and 1319 strings.

Figure 4 shows the overlay visualization. The newer the research occurs, the brighter the visualized color. From the research data, it appears that the colour of the research under 2017 appears dark or blue, while the research over 2020 is bright yellow. Bocce and student research with special needs occurred a lot from 2017 to 2019. This can be seen from the colours that appear.

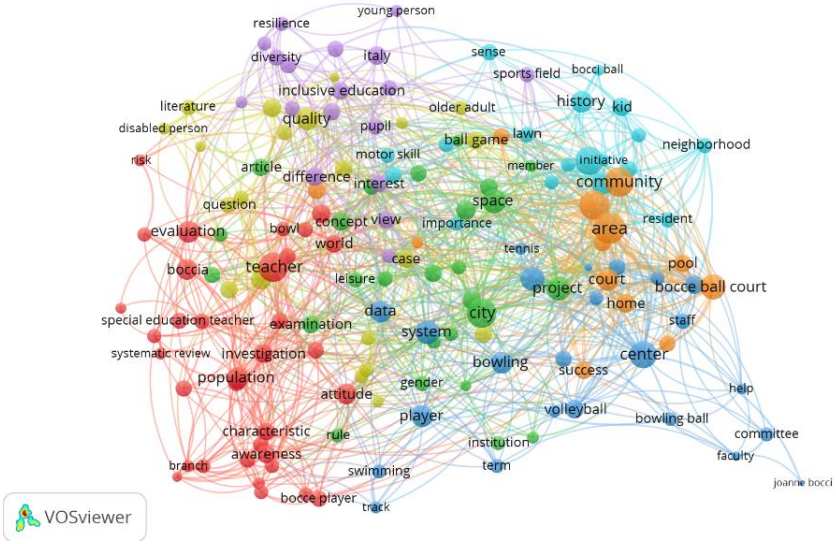

Fig. 2. Network visualization.

Figure 4 shows the density visualization. The results of the analysis show that the research has sufficient density visualization. Research on bocce and students with special needs is still a little research. This can be seen from the size of the circle and the visible light color.

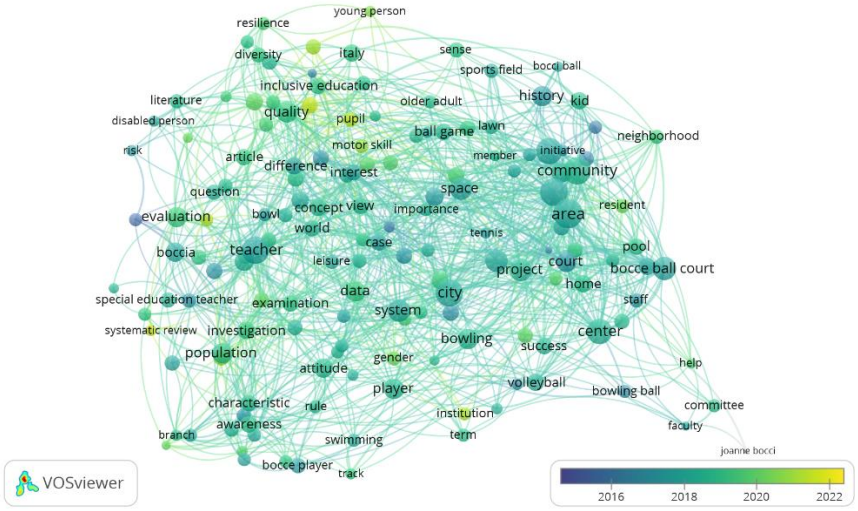

Fig. 3. Overlay visualization.

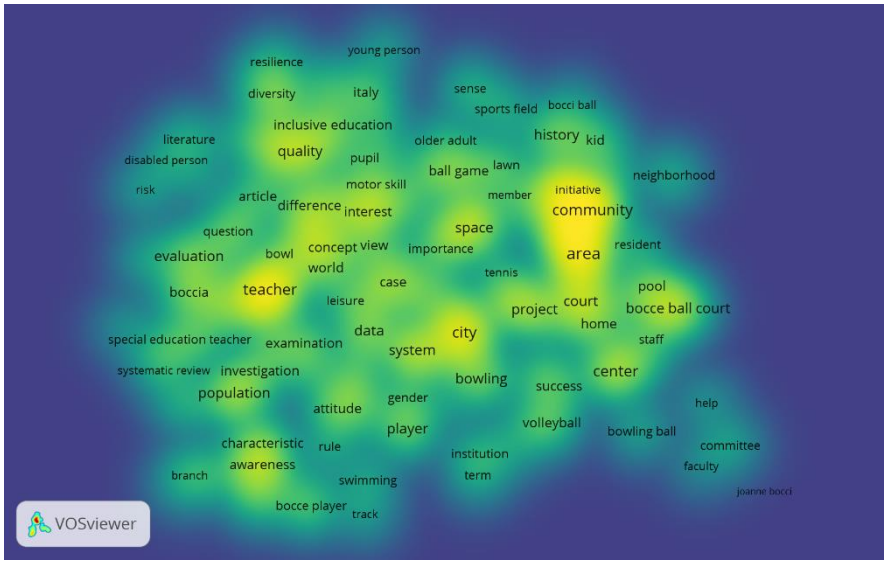

Fig. 4. Research procedure.

3.2. Student demography

The subjects of this study were 8 students in special education. The 8 people had the initials A, B, C, D, E, F, G, and H. They were students of special education level 3, Universitas Pendidikan Indonesia. The knowledge of these eight students about bocce sports for children with special needs is still minimal. Before this research was conducted, they only knew that bocce was often an activity to commemorate the International Day of Persons with Disabilities. Then they know that this sport can be done by children with special needs with various obstacles. However, they do not yet know the flow of the game and how the rules of bocce sport are for these children with special needs. Whereas prospective educators are required to be able to teach their students, especially students with special needs. every child has a different potential [21-24]. They have the right to receive the same education. Inclusive education provides an understanding of education for all. Children with special needs need special education and services [25-28]. In various learning activities, they must be involved, especially in bocce learning.

3.3. Process and analysis result data

Activities carried out before learning; we prepare the field by marking the lines according to the standard size of throwing the ball. Then we prepare colored balls and pallina balls. Learning begins with prayer. Students are informed about the learning that will be carried out and then the purpose of the learning. This activity is carried out to ensure that students are ready to participate in the learning process. Conditioning students before the learning process is important so that learning runs effectively [29].

The core activity begins by introducing the tools needed in the bocce game, namely red balls, blue balls, pallina balls, flags, and meters. Then students are introduced to the function of each object that is needed. The red and blue balls are the balls that each group will throw. The pallina ball is the group deciding ball

which throws the colored ball first. Flags to determine which team is the turn to throw the ball. The meter is used to determine the distance of the colored ball from the pallina ball. After being introduced, students are shown the bocce game step by step, namely (i) Choose the team randomly to throw the jack ball first, (ii) Choose the position of the foot, which is behind the first line of the field, (iii) Throw the jack ball in front of the third line of the field, (iv) If the first team fails, the second team throws a jack ball in front of the third line of the field, (v) The team that succeeded to throw jack ball is allowed to throw one colored ball, (vi) Another team throwing one colored ball too, (vii) Measure the distance between the two balls is closest to the jack ball, (viii) The team who is the ball is farther from jack ball is allowed to throw the colored balls again 3 times until the colored balls run out, (ix) Another team throws the colored balls 3 times until the colored balls run out too, (x) Measure the team closest to the jack to determine the winner. Each stage is explained while being exemplified by the teacher and then practiced directly by the students. During the treatment, each practice was recorded and assessed.

After all the core activities are completed, the educator will provide opportunities for students to play the bocce game according to what he understands at that time. Every student does the bocce game without direction but based on the knowledge he gets after learning. In this activity, we conducted an assessment and evaluation to find out changes in the level of students' abilities regarding the stages of the bocce sport. An important assessment and evaluation was carried out to determine changes in the level of students' understanding [30, 31]. In this study, we analysed developments regarding English language research in science education for students with special needs. Data were obtained using the Publish or Perish program. Publish or Perish is software that is used to harvest bibliographical metadata of scientific works in all fields of science for free [32]. We obtained research data from 993 articles over 11 years.

3.4. Analysis result data

Table 1 is the distribution of student knowledge assessment through interviews and observations in the 1st week. Students' knowledge increases in the practice of sports. As many as 70% of students have scores above 70. One of them already understands more about the stages of bocce sports for children with special needs, namely at the stage of (i) positioning the body behind the line, (ii) measuring the distance between the jack ball and the colored ball, which further determines the turn of the team that plays next (iii) throwing jack to the front of the 3rd line of the field, (iv) throw a colored ball close to the jack ball, and (v) determine the winner of the game. The simple learning process and direct practice make it easier for students to understand the material being taught. Learning while doing makes it easier for students to understand the information presented [33]. In the 2nd week, Students' knowledge increased at the game stage which was still the same as in week 1, but more students had increased knowledge. In addition, in this 2nd week, students can fully prepare the tools needed for the bocce game.

The average student's knowledge in the first week gets a score of 7 to 8 points out of a maximum total of 30 points. The total score is 60. The average score is 7.5. The average (%) is 25%. Their average knowledge increases during live games. The learning process through the direct instruction method makes it easier for students to understand the material presented. Through direct practical activities,

students easily understand the steps of activities according to the material being taught [34].

Table 1. First week data.

Name	A	B	C	D	E	F	G	H
Score (First week)	8	6	10	8	8	8	6	6
Score (Second week)	14	14	14	14	10	10	10	14

The average number of scores and the average knowledge percentage of the 2nd week. The average knowledge of students gets a score of 12 points or the equivalent of 6 stages that are well understood.

Every student has different potential. They need methods and media that suit the needs of students. The choice of method is very important to think about so that the learning process runs effectively. Methods that suit student needs make it easier for students to understand the material being taught [34, 35].

Figure 5 is the graph of the average increase in student knowledge about bocce sports for children with special needs. From week to week, students' knowledge continues to increase to the point that they can play independently and use game tools well. Through the direct instruction method, students' knowledge has increased. This can be seen from the increase in the value obtained. Special education and services are needed by each student according to their needs. Thus, the potential of students develops optimally [35].

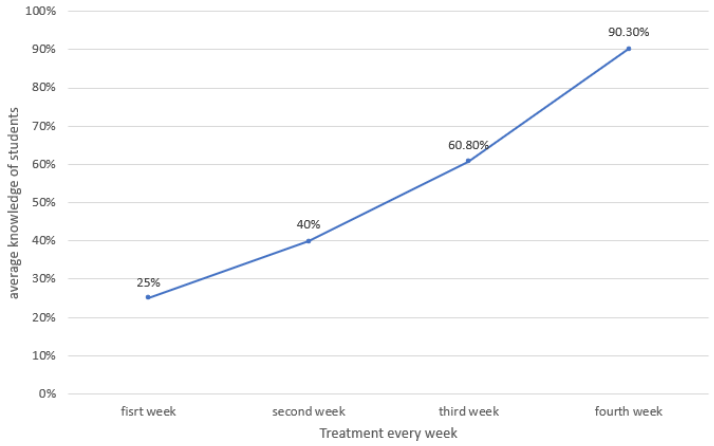

Fig. 5. Student's knowledge during four weeks.

4. Conclusion

The direct instruction method is a learning method by practicing directly step by step what is learned. This method supports the delivery of bocce sports material for children with special needs to students. Students become easier to understand because they can directly practice step by step this bocce sports activity. Based on this, the result of this study is an increase in student knowledge about bocce sports for children with special needs. This can be seen from the results of the action test during treatment and after the treatment was completed, students' knowledge increased by

88%. The results of this study are expected to be a solution for teachers in increasing knowledge about sports for children with special needs, especially for students.

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