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Comparison of Learning Outcomes of Students taught Using Quantum Teaching Models with Direct Learning Models on the Main Sub-Matter of the Human Respiration System at Muhammadiyah Rappang High School

Madaling[1], Sam Hermansyah[2],Usman M[3], Khaeriyah Adri[4], Hasan[5]
[1234]Universitas Muhammadiyah Sidenreng Rappang
[5]Universitas Muhammadiyah Enrekang
madaling@fkip.umsrappang.ac.id
,sam.hermansyah82@gmail.com
stkipusman@gmail.com
reekhaeriyah@gmail.com
achank.hasan80@gmail.com

ABSTRACT

This research aims to find out which learning model is best to use between Quantum Teaching and Direct Instruction on the main sub-subject of the Human Respiration System. This research was carried out on 11-30 August 2022, where the research was carried out at SMA Muhammadiyah Rappang. The population of this research was all class XI students consisting of two classes, with a sample of 80 people. Sampling was carried out using Total Sampling. The instruments used in this research were the Learning Implementation Plan (RPP) and tests in the form of questions about the Human Respiration System. Evaluation is carried out by giving a multiple choice test with 20 questions. Data were analyzed using the t test. The results of the research show that the learning outcomes of students who were taught using the Quantum Teaching Learning Model in the main sub-material of the Human Respiration System in class . The learning outcomes of students who were taught using the Direct Instruction Model on the main sub-material of the Respiration System in Humans in class Thus, the learning outcomes of students taught using the Quantum Teaching Learning Model with the Direct Instruction Model on the main sub-material of the Respiration System in Humans in class namely 4.4 > 1.994 so it can be concluded that the Ho Hypothesis is rejected and the Ha Hypothesis is accepted, meaning that there is a difference in student learning outcomes taught using the Quantum Teaching Learning Model and the Direct Instruction Model in class XI of SMA Muhammadiyah Rappang for the 2022/2023 academic year. .

Keywords: Learning Model, Quantum Teaching, Direct Instruction.

PENDAHULUAN

Kemajuan masyarakat modern dewasa ini tidak mungkin dicapai tanpa adanya kehadiran dunia pendidikan sebagai pilar dalam menciptakan generasi penerus yang berkualitas. Pendidikan merupakan tiang utama dalam negara. Tanpa pendidikan yang berkualitas maka tidak akan pernah tercipta sumber daya manusia yang berkualitas khususnya para students in achieving success in learning. This is because the quality of human resources has been very low, such as the low academic achievements, especially in exact sciences. Therefore, in an effort to improve the quality of education optimally, then.

aspects related to the teaching and learning process need to be evaluated, updated, and improved.

Untuk meraih kesuksesan dalam hidup diperlukan pendidikan. Pendidikan yang baik di dalamnya terdapat proses belajar mengajar yang baik karena belajar mengajar merupakan prilaku inti dalam proses pendidikan dimana anak didik dan pendidik saling berinteraksi. Selain itu, seorang siswa yang ingin mencapai cita- citanya tentu harus belajar dengan giat, karena belajar adalah syarat untuk menjadi pintar dalam segala hal, baik dalam ilmu pengetahuan maupun keterampilan serta kecakapan.

Realizing the process of teaching and learning activities. required elements The most important thing, among others, is how teachers can stimulate and guide students in learning, which in turn can encourage students to achieve optimal learning outcomes through student learning.

can stimulate be creative In directing changes in behavior and student growth, the reality in the field is not like that. Teachers, when teaching, are only the center of attention and do not involve their students in the teaching and learning activities. This is what can make students feel bored in participating in teaching and learning activities.

Based on above, elements that influence the achievement of learning outcomes must be given maximum attention so as to produce good quality students. However, the reality so far shows that every teaching evaluation carried out often results in unsatisfactory results, including in science-biology teaching in general.

From the results of the researcher's interview with the Biology study teacher on June 9 2022 which was conducted at Muhammadiyah Rappang High School, the average grade in biology for class which had been previously determined by the teacher was 6.50. From these data it can be concluded that the planned learning objectives have not been achieved. This means that students' motivation to learn biology is still low, especially in the 2022/2023 academic year, biology subjects have been included in in the National Examination (UN) with a passing standard of 5.25. Of course, there are several factors that can influence this, including students' lack of interest in learning the lessons being taught. However, efforts to create real conditions where students want to be fully involved in teaching and learning are not easy. For this reason, a learning model is needed that makes an important contribution to biology lessons.

Based on these observations, researchers saw that students and teachers had many shortcomings. As an example of a deficiency that the biology teacher has is that he provides a learning approach, especially in the main sub-subject of the Respiratory System in Humans, does not use a variety of teaching methods but only focuses on the lecture method so that sometimes students feel bored and bored. The lecture method is a teaching method that teachers tend to use because this method is very practical and does not require extra tools, materials and preparation.

One of the ways that can

One way to overcome these problems is by selecting the appropriate learning model. The existence of learning models helps students acquire information, ideas, skills, ways of thinking, and expressing their own ideas. A model that expands its understanding with a learning model is a plan or pattern used as a guide in planning classroom or tutorial learning. One of the contextual learning models is modeling, in which methods such as demonstration, question and answer, and other unique methods are used to teach specific skills or knowledge on a model that can be imitated. The application can be done through the Quantum Teaching Learning Model with the Direct Instruction Learning Model.

Quantum Learning Model.

Teaching focuses on the dynamic relationships within the classroom environment that establish the foundation and framework for learning.

Meanwhile, Direct Instruction is one of the teaching models specifically designed to support students' learning processes related to well-structured declarative knowledge and procedural knowledge that can be taught step by step. In other words, it is a learning concept that helps teachers connect the taught material with the real-world situations of the child and encourages students to make connections between their knowledge in everyday life.

Based on the description above, then. The author is interested in conducting research related to the teaching problem carried out with Quantum Teaching Learning and Direct Instruction Models on student learning achievement in the main sub-material of the Human Respiratory System in class XI of SMA Muhammadiyah Rappang in the 2008/2009 academic year.

Research Method

This research was conducted at SMA Muhammadiyah Rappang. The population in this study consisted of all students in class XI of SMA Muhammadiyah Rappang for the Academic Year 2022/2023, which consisted of 2 classes, each class consisting of 40 students, making a total population of 80 students. The research sample consisted of 2 classes, namely class XI IPA-1 and XI IPA-2. The first class was taught using the Quantum Teaching Model and the second class was taught using the Direct Instruction Model.

Data Collection Techniques

Research instruments are measurement tools used in a study. The instruments used for data collection in this research are Lesson Implementation Plans (RPP) as the planning of activities in the teaching and learning process, and a written test in the form of multiple-choice objective test consisting of 20 questions.

obtained validity, reliability,

The level of difficulty and power is different.

Data analysis technique

Data analysis techniques are carried out in the following way:

a. After the data is collected, namely the initial test and the final test obtained from both sample groups, the research hypothesis can be tested.
b. Tabulating the score data from each class that uses teaching with the Quantum Teaching Model and the Direct Instruction Model.
c. Creating frequency of values for each class.
d. Calculate the average score of each class.
e. Menghitungstandart standard deviation.
f. Hypothesis testing with two-sided t-test.

Research Results

Before the test is given to the students, a test trial has been conducted on August 7, 2022 at SMA Muhammadiyah Rappang to measure the validity, reliability, and differentiation power of the test.

Validity Test

Dari hasil uji coba diperoleh hasil belajar siswa. Dari hasil tersebut ditentukan validitas soal berdasarkan harga rxy dan rtabel dengan jumlah sampel adalah 40 pada taraf kepercayaan α = 0,05 sehingga diperoleh rtabel = 0,312. Sebagai contoh soal No. 2 diperoleh harga rxy = 0,75 (perhitungan rxy butir soal no. 2), dengan cara yang sama dilakukan untuk seluruh soal. Berdasarkan kriteria rxy > rtabel untuk menyatakan bahwa soal tersebut valid, maka dari 25 soal yang diujikan terdapat 20 soal yang valid dan 5 soal yang tidak valid.

Uji Reabilitas Tes

The reliability test can be calculated with the number of questions being 20 determined at a confidence level (α = 0.05) so that rtabel = 0.444 (appendix 13) from appendix 11, the formula for the total variance value can be found, which is 11.310, then it is inserted into the reliability formula to obtain the value of r11 =.

0.70 (attachment 12). From the test results, it was obtained that r11 > rtable, which is 0.70 > 0.444, so it can be said that the question is reliable with a high reliability category.

Level of Difficulty Test

In carrying out the difficulty level of the questions, an analysis of the items is first conducted for the upper and lower groups of students, then the difficulty level of the questions for Question No.1 can be determined. Using the same method, the difficulty level can be determined for each subsequent question, so it is known that out of the 20 questions that have been tested, 3 questions are categorized as moderate and 17 questions are categorized as easy.

Differentiation Question

Based on the analysis of the items for the top and bottom groups of students, the distinguishing power for question No.1 can be determined. Using the same method, the distinguishing power can be determined for each subsequent question, so it is known that out of the 20 questions that have been tested, 15 questions are categorized as good and 5 questions are categorized as sufficient.

From the results of processing the learning outcomes of students taught using the Quantum Teaching learning model, the highest score is 9.5 with 1 student, while the lowest score is 5 with 2 students. However, the most frequent score is 8.5 with 9 students.

Research Results Taught Using Direct Instruction Model.

From the results of processing the learning outcomes of students taught using the Direct Instruction Model, the highest score is 9 for 3 students, while the lowest score is 4 for 1 student. However, the most frequent score is 6 for 8 students.

Analysis of Student Learning Outcomes Taught Using

Average value of students taught using Learning Model.

Quantum Teaching adalah 7,62 dengan nilai tertinggi 9,5 dan nilai terendah adalah
The standard deviation of students taught using the Quantum Teaching Learning Model is 1.15.

Analysis of Student Learning Outcomes Taught Using the Direct Instruction Model

The average score for student learning outcomes taught using the Direct Instruction learning model is 7.48 with the highest score being 9.5 and the lowest score being 5.5. The standard deviation of students taught using the Direct Instruction Model is 1.55.

Hypothesis testing

From the results of data analysis, the average score of students taught using the Learning Model was obtained

Quantum Teaching is $\bar{x} = 7.62$.

The average score of students taught using the Direct Instruction Model is.

$\bar{\xi} = 6.30$. To τεστ σιγνιφιχανχ ε.

the difference between the two average values above is tested using t-test, but first the combined variance of the two data is determined to be 1.95. Thus, from the calculation above, t-value is obtained = 4.4. To determine the t-table, the table is used.

t distribution (appendix) with Αλπηα Υνκνοων 0.05

dan dk = n + n - 2 is: (40 + 40 - 2 = 78). Therefore, t (1-1/2 α) (dk) is $t_{(0,975)(78)}$ 1,994.

Alternative hypothesis or H0 is accepted if tcount > ttable, while Ho is rejected if tcount < ttable. From the research results, tcount = 4.4 and ttable = 1.994. Thus, it is known that tcount > ttable, which is 4.4 > 1.994, so the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted, meaning there is a difference in student learning outcomes taught using the Quantum Teaching Learning Model compared to students taught using the Direct Instruction Learning Model in the sub-material of the Human Respiratory System in class XI of SMA Muhammadiyah Rappang in the 2022/2023 Academic Year.

Discussion

Based on the test results outlined above, it is proven that there is a difference in student learning outcomes when taught using the Quantum Teaching Learning Model compared to the Direct Instruction Learning Model. In the Quantum Teaching Learning Model, the highest score of 9.5 was obtained by 1 student, while the lowest score of 5 was obtained by 2 students, with an average score of 7.62, which falls under the good category, and a standard deviation of 1.15. From the average score and standard deviation of 7.62 ± 1.15, the standard deviation can be seen as follows:

- The lower limit is 7.62 - 1.15 = 6.47.
- The upper limit is 7.62 + 1.15 = 8.77.

So, the range of standard deviation in the Quantum Teaching Learning Model is 2.3.

Meanwhile, for classes taught using Direct Instruction, the highest score is 9 obtained by 3 students and the lowest score is 4 obtained by 1 student with an average score of 6.30, which falls under the category of sufficient with a standard deviation of 1.55. From the average score and standard deviation of 6.30 ± 1.55, the standard deviation can be seen as follows:

- The lower limit is 6.30 - 1.55 = 4.75.
- The upper limit is 6.30 + 1.55 = 7.85.

So, the range of standard deviation in Direct Instruction Learning Model is 3.1.

If seen from the average value on. 2 kelas yang dijadikan sampel penelitian, kelas yang diajar dengan menggunakan Model Pembelajaran Quantum Teaching$\bar{x}$ **= 7.62 ± 1.15 and the class taught using the Direct Instruction Learning Model.**$\bar{x}$**= 6,30 ± 1,55. Maka, dapat dilihat penyebaran nilai terhadap Standart Deviasi pada Model**

Quantum Teaching learning is smaller than the Direct Instruction Model. So, the small spread in the first learning model compared to the second learning model shows that students are taught using the Learning Model Quantum Teaching masters the material better than students who are taught using the Direct Instruction Model.

Thus, students taught using the Quantum Teaching Learning Model with a value of x = 7.62 are higher compared to$\bar{x}$ students taught using the Direct Instruction Learning Model with a value of x = 6.30. Based on these results, the Quantum Teaching Learning $\bar{x}$ Model is more appropriate to be used to teach the Respiratory System in Humans in class XI of SMA Muhammadiyah Rappang in the 2022/2023 Learning Year.

From hypothesis testing, the value obtained tcount > ttable is 4.4 > 1.99 so that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted, meaning that there is a difference in the learning outcomes of students who are taught using the Quantum Teaching Learning Model and the Direct Learning Model (Direct Instruction) in the main sub-material of the Respiration System in Humans in class XI SMA Muhammadiyah Rappang 2008/2009 Academic Year.

This is because in the Quantum Teaching Learning Model, it turns out to motivate students to be more active and creative in the learning process. This can be seen from the freedom of activities that arise in students during the learning process. For example, they feel free to ask questions and interact with each other, not just focusing on one direction, creating a conducive learning atmosphere in achieving learning goals.

The statement is in accordance with. pendapat yang dikemukakan oleh Deporter, B. (2000) namely in Quantum Teaching learning there is a lively way of learning with all its nuances, including all connections, interactions, and differences that maximize learning moments and focus on dynamic relationships in the classroom environment-interactions that establish a foundation and framework for learning.

The material on the Respiratory System in Humans consists of indicators; the structure and function of the respiratory organs, the mechanism of respiration, the difference between chest and abdominal breathing, the process of air exchange, respiratory diseases and technology, Quantum Teaching is more appropriate to be used as a learning model. For example, in the indicator of the difference between chest and abdominal breathing. Quantum Teaching, which has 5 stages abbreviated as Tandur,

in the natural stage, students are required to experience and feel the actual events based on their learning experiences.

This is also supported by the opinion. Bahri (1995) is that the teacher's task is to create a teaching and learning condition that can lead students to an exciting and enjoyable learning atmosphere for students usually brings more. Harmonious teaching and learning activities. Students feel comfortable and not bored sitting for a long time in their seats in order to achieve learning goals. This is not possessed by the Direct Instruction teaching model. In the Direct Instruction teaching model, there is a teaching and learning process that is only centered on the teacher (teacher-centered), so communication style mostly occurs in one direction (one-way communication). Selain that. Direct Instruction Learning Model has weaknesses including less successful use in limited teaching and learning activities so that students who perform not so long and student opportunities. to develop his skills will limited.

CONCLUSION

Based on the description of the research above, several conclusions can be drawn.

a. The average learning outcomes of students taught using the Quantum Teaching Learning Model in the main sub-material of the Human Respiration System in class
b. The average learning outcomes of students taught using the Direct Instruction Model in the main sub-material of the Human Respiration System in class .
c. From the hypothesis test, it is obtained that tcount > ttable is 4.4 > 1.99 so that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted, meaning that there is a significant difference between the learning outcomes of students taught using the Quantum Teaching Learning Model and the Direct Learning Model. (Direct Instruction) on the main sub-material of the Human Respiration System in class XI SMA Muhammadiyah Rappang for the 2022/2023 Academic Year.

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