

Discovery-Inquiry Learning Model in Delivering Living Creature Classification Material for High School/ Equivalent Schools

Novie Ary Priyanti¹, Raditya Pratama¹, Eunike Sri Puspaningsih¹, Ika Rahmania², Niswatus Sufiyah¹, Liza Choirun Nisa¹, M. Zainul Muttaqin¹, Sarlotha Selan¹

¹Cipta Wacana Christian University

²SMPN 6 Malang, Malang, Indonesia

Article history

Received: 10 June 2024

Revised: 11 June 2024

Accepted: 15 June 2024

Keywords

Learning method

Discovery-inquiry

Classification of living things

Abstract

This research provides an understanding of why the Discovery-Inquiry learning method as a means to deliver the classification of living things. This research uses a descriptive qualitative approach, descriptive by conveying clearly what is meant by discovery-inquiry and why it is appropriate when implemented in the material of the diversity of living things. Education is a planned and conscious effort to create a learning atmosphere and learning process in which students actively develop their potential, discovery-inquiry is an option in its delivery. Discovery-inquiry is a learning process where a concept is not presented in its final form, but students must organize their own learning by finding out these concepts. Meanwhile, the classification of living things classifies living things based on certain characteristics. So, of course it is very related to the discovery-inquiry method which requires students to play a greater role than the teacher by finding and ensuring the object under study whether it is in accordance with the theory or finding something new.

1. Introduction

Education is a planned and conscious effort to create a learning atmosphere and learning process in which students actively develop their potential in the form of spiritual strength, religious self-esteem, mastery, character, intelligence and nobility, as well as the skills needed by students. to have religious beliefs. mental strength, self-control, character, intelligence and noble qualities, as well as skills needed for oneself, society, nation and state (Sanjaya, 2011). Education plays a very important role in preparing quality human resources for country development. Humans will mature and develop holistically through education.

Education can create quality human resources (Anugraheni, 2017). Education is influenced by several factors, namely (1) student contribution; (2) educational facilities and infrastructure;

(3) teaching materials; and (4) human resources (teachers) who can help in creating a conducive atmosphere (Anugraheni, 2017). In RI Law no. 20 of 2003, education is a planned and conscious effort to create a learning atmosphere and learning process where students actively develop their potential to obtain spiritual, religious strength, self-control, noble character, intelligence, noble character and the necessary skills. . Educational goals can be achieved if learning activities run smoothly and rhythmically. It is said that a person learns if within that person there is activity with the environment that brings about changes in behavior and lasts for a relatively long time. Suyono explains that learning is an activity or process that aims to gain knowledge, develop skills, perfect behavior and attitudes, and strengthen personality (Suyono, 2011). With this learning activity, it is necessary to increase student learning efficiency.

Learning is a process that occurs in a person as a result of his efforts to obtain changes in knowledge, skills, new experiences as a result of interaction with the environment. Learning outcomes are changes in student behavior that can be observed and measured as changes in knowledge, attitudes and skills. Learning outcomes are the culmination of the learning process (Dimiyati & Mudjiono, 2009). Natural sciences, commonly known as natural sciences (IPS), are defined as knowledge obtained by collecting data through experiments, observations and

*Corresponding author: novieary@cwcu.ac.id

doi:

© 2024 The Authors

This work is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/)

inferences to provide reliable explanations about a phenomenon (Trianto, 2014). The science learning process emphasizes providing direct experience to develop skills in exploring and understanding the natural environment scientifically (Hardini & Pupita, 2012). One of the science subjects in high school is Biology, which of course has the same character as its parent subject, the skills and ways students find answers through observation and exploration are the points where students seek knowledge.

Biology subjects in learning should not only be teacher-centered, but also involve students. This means that learning must maximize students' ability to find and identify information so that they can discover their own knowledge. This learning is called discovery learning. Exploratory learning is a learning strategy that tends to require students to carry out observations, experiments or scientific actions to draw conclusions from the results of these scientific actions (Saifuddin, 2014). In this explorative learning model, students are encouraged to discover for themselves what is being studied and then build that knowledge by making meaning of it.

In this model, the teacher is only a facilitator. The main characteristics of the explorative learning model are; 1) explore and solve problems to generate, combine, and generalize knowledge; 2) student-centered; 3) activities that combine new and existing knowledge. According to Wicaksono, et al (2015) "Exploratory learning is useful in; 1) increase students' intellectual potential; 2) transition from external to internal rewards; 3) deep learning through inquiry; 4) a tool for training memory." According to Puppita et al (2016), the Exploratory Learning model emphasizes the importance of understanding a concept through students' active participation in the learning process. This learning model emphasizes the formation of student knowledge from experience in the learning process. The application of the discovery learning model in learning will create learning motivation so that student learning outcomes increase, especially elementary school students.

Following the results of previous research, Rosarina et al (2016) conducted research "Applying the discovery learning model to improve student learning outcomes regarding the material on changes in the shape of objects." Based on the results and discussion, it can be recommended that the application of the exploratory learning model is an alternative to improve student learning achievement, especially in terms of changing material in the form of objects. This increase can be seen from the level of completion of each cycle. The number of students who declared that they had passed the first semester based on the test results was 7 students (26.92%), the second term was 17 students (65.38%) and the third term was 23 students (88.46 students). Cintia et al. (2018) conducted research with the title Applying an exploratory learning model to increase student creativity and learning outcomes. Explanation The level of learning achievement was 71.8%, the average was 69.48, the highest score was 82.5 and the lowest was 50. In cycle II, the level of creative thinking skills was 81.2%, the average was 32.2. Learning outcomes were 84.6%, average 74.2, highest score 87.5 and lowest 55. It can be concluded that the application of the discovery learning model can increase creative thinking skills and student learning achievement. From this research, it can be concluded that the discovery learning method is very suitable for Classification of Living Creatures material, because to determine animals, plants and other living creatures requires direct observation after being given theory in previous lessons.

2. Method

The methodology used in this research uses a descriptive qualitative approach with secondary data methods, especially through literature studies obtained from journals or supporting articles. Afifuddin's (2012) literature review is a tool that is as important as contextual assessment, where literary works are very helpful and helpful in providing context and meaning to the writing created and through this assessment. knowing why what you want to study becomes a problem for research, both in terms of the research subject and the environment that is the focus of the research. The relationship between the research and other related research. It is hoped that this understanding can be used as a guide in its implementation.

3. Result and Discussion

1. Discovery Learning

Exploratory learning (discovery learning) is a learning process where a concept is not presented in its complete (final) form, but students must organize their own learning by finding out these concepts. Widyastuti (2015) states that "Discovery learning is discovery-based learning (query-based), constructivist, and theory-based about how to learn. This learning model is given to students who have a learning scenario. to solve real life problems and encourage them to solve their own problems When solving the problems at hand, because they are constructivists, students use their previous experiences in problem solving.

Discovery is a learning model developed on the basis of constructivism. This discovery model emphasizes the importance of understanding the structure or key ideas of science, through active involvement of students in the learning process. Exploratory learning is a learning process that occurs when students manipulate, organize, and change information so that they discover new information. According to Salmon (2012), in its application, the Discovery Learning model develops active learning for students with self-discovery, self- investment, so that the results obtained will last a long time in memory.

Characteristics of the discovery learning model according to Arika et al (2015) Characteristics of the discovery learning model. There are three characteristics of the Exploratory Learning model, namely:

- a. Explore and solve problems to create, combine, and generalize knowledge
- b. Student-centered
- c. Activities that combine new knowledge with existing knowledge.

Exploratory Learning Stages Learning Model According to Wulandari et al (2015) Discovery learning includes the following steps:

- a. Identify the problem
- b. Develop possible solutions (hypotheses)
- c. Data collection
- d. Data analysis and interpretation
- e. Check the conclusion

Hamalik (2009) "learning that corrects or strengthens behavior through experience (learning as modification or strengthening of behavior through experience)". This means that learning is a change in the individual, the result of the experience of interacting with the environment. Followed by Abdurrahman and Mulyono (2009) "learning is a form of development or change in a person which is expressed in new ways of behaving through experience and practice". Changes that occur in certain situations depend on the contents of memory, making the learning process an interaction of changes in behavior or appearance, with various kinds of activities. Meanwhile, Irwanto (2002) explains that "learning is just a process of change from impossible to possible and occurs over a certain period of time. These changes occur over a relatively long period of time and can be predicted.

2. Classification of Living Things

Classification of living things is a grouping of living things based on certain characteristics they have. Taxonomy itself is a branch of biology that studies the classification of living things. The basic classification of living things is:

- a. Organisms that have certain characteristics in common are included in the same group.
- b. From the members of the group, look for similarities and differences to classify them again into smaller groups.
- c. Organisms in one group have a close relationship.
- d. The more similarities in characteristics, the closer the relationship.
- e. example: humans are more closely related to monkeys than chickens.

Benefits of Classification of Living Things. Firstly, to simplify the diverse objects of biological study so that they are easier to study. Second, you can find out the relationship between one organism and another. (Iraningtyas.2013)

There are several experts in carrying out classification, including:

- a. Aristotle: Classification of Animalia
- b. Theophrastus: Plantae Classification
- c. John Ray: Classification of Plantae into smaller groups
- d. Carcius Linnaeus: Giving scientific names to each organism
- e. Georges Cuvier: Classification of Animalia into 4 branches
- f. Edward Chattan: Differences between Prokaryotes and Eukaryotes
- g. R. H. Whittaker: Classification of the 5 Kingdoms
- h. Cart Woese: Classification of 6 Kingdoms

The basics of classification can be done through: physical characteristics, morphology, reproductive methods, benefits, chromosome characteristics, chemical content (Widiyanti.2013)

Various Classification Systems

a. Classification of Natural Systems. Classification to form natural taxa (according to nature's wishes). Proposed by Aristotle. Organisms are grouped into 2 kingdoms, Animalia (based on habitat and behavior) and Plantae (based on size and structure)

b. Classification of Artificial Systems for practical purposes, for example based on their benefits. Examples: ornamental plants (rose, jasmine), medicinal plants (ginger, ginseng). Put forward by Carolus Linnaeus.

c. Classification of Phylogenetic Systems The kinship relationships of organisms are determined based on their evolutionary processes. Proposed by Charles Darwin. Example:

- o Chordata: backbone
 - o Echinoderms: have no backbones
 - o Arthropods: segmented, book-shaped legs
 - o Annelids: segmented worms
 - o Mollusca: tripoblastic stomata, soft-bodied invertebrates
 - o Nematelminthes: spinworms, tapeworms
 - o Planthyelminthes: flatworms, liver flukes
 - o Chiorophyta: green algae
 - o Other protozoa: rhizopods, flagellates
 - o Metazoa: multi-celled organisms
 - o Chiorophyta: green algae
- d. Modern System Classification

Based on the relationship between organisms, chromosomal and biochemical characteristics, as well as comparison of molecular structures. Based on the phylogenetic system. Levels in Taxon: levels of groups of living things from the highest level to the lowest level starting from Kingdom, Phylum/Division, Class, Order, Family, Genus, Species and Varieties. With the following meaning:

- o Kingdom: divided into animalia, plantae, fungi, protista, monera
- o Phylum: animal taxon, Division: plant taxon.
- o Class: plant class names use different endings, such as ~obsida for mosses and ~phyceae for algae.
- o Ordo: plant order names usually use the suffix ~ales, such as solanales, rosales.
- o Familia: grouped based on certain similarities in characteristics. Example: animals use the suffix ~idae such as felidae for cats, canidae for dogs.
- o Genus: grouped based on similarities in certain more specific characteristics. The condition for writing a genus name is that the first word is capitalized and italicized, for example sugar cane (*Sccharum*)
- o Species: have the most characteristics in common. Consists of 2 words, the first word shows the genus, the second word shows the specifications. Example: *Rosa alba*.
- o Varieties: writing plant varieties begins with an abbreviation that is italicized/underlined, for example *Oryza Sativa indica* (rice).

Example of Plantae classification: Maize Taxon Maize g (Gets UP. 2004)

Maize taxon

Kingdom	: Plantae
Divisi	: Magnoliophyta
Kelas	: Liliopsida
Ordo	: Poales
Famili	: Poaceae
Genus	: Zea
Spesies	: Zea mays



Figure 1. Example of classification of Plantae Zea mays

Example of Animalia classification: Cow (Bojanus, L.H. 1827)

Kingdom	: Animalia
Divisi	: Chordata
Kelas	: Mammalia
Ordo	: Artiodactyla
Famili	: Bovidae
Genus	: Bos
Spesies	: Bos Taurus



Figure 1. Example of classification of Plantae Zea mays

The classification of the two examples above cannot be known if you do not make observations and also match them with existing theories, so of course the material on the classification of living things that is very suitable as a learning method is Discovery Learning. By using this method where students carry out exploration that is adapted to the material, it makes students more confident in the knowledge they have, so that the teacher only has the task of being a facilitator in the process of justifying the knowledge they have.

4. Conclusion

Discovery-inquiry is a learning process where a concept is not presented in its complete (final) form, but students must organize their own learning by finding out these concepts. Meanwhile, the classification of living things groups living things based on certain characteristics they have. So, of course it is closely related to the discovery-inquiry method which requires students to play a bigger role than the teacher by searching for and ensuring whether the object under study is in accordance with theory or discovers something new.

Author Contributions

All the authors contributed to the study.

Funding

The current study is not funded by any institution.

Declaration of Conflicting Interests

The current study do not comply to any conflict of interest.

References

- Ahmadi, A. & Widodo, S. (2004). Psikologi Belajar. Cetakan ke-2. Jakarta: Rineka Cipta.
- Arifin, Z. (2009). Evaluasi Pembelajaran Prinsip Teknik Prosedur. Bandung: PT. Remaja Rosdakarya.
- Arika, I., Galuh, A. N., & Sukardjo, J. S. (2015). Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Aktivitas Dan Prestasi Belajar Pokok Bahasan Larutan Penyangga Pada Siswa Kelas Xi Ipa Semester II Sma Negeri 1 Ngemplak Tahun Pelajaran 2013/2014. Jurnal Pendidikan Kimia, Universitas Sebelas Maret. Volume 4, Nomor 2, hal.67.
- Bojanus, L. H. (1827). "De Uro nostrate ejusque scelecto Commentatio: Scripsit et bovis primigenii scelecto auxit". Nova Acta Academiae Caesareae Leopoldino Carolinae Germanicae Naturae Curiosorum. 13 (2): 413–478.
- Cintia, N. I., Firosalia, K., & Indri, A. (2018). The Implementation of Discovery Learning Model in Increasing Students Thinking Creative Ability And Students Learning Outcome. Jurnal Perspektif Ilmu. Pendidikan Guru Sekolah Dasar, Universitas Kristen Satya Wacana. Volume 32, Nomor 1, April 2018 Halaman 69-77.
- Dimiyati & Mudjiono. (2009). Belajar dan Pembelajaran. Jakarta: Rineka Cipta.
- Gepts P. (2004). Crop Domestication as a Long-term Selection Experiment. In: Janick J. Plant Breeding Reviews, Vol. 24, Part 2, ISBN 0-471-46892-4. John Wiley & Sons, Inc. hal. 6
- Hamalik, O. (2009). Psikologi Belajar dan Mengajar. Bandung: PT Sinar Baru Algensindo.
- Hardini, I, & Puspita D. (2012). Strategi Pembelajaran Terpadu. Yogyakarta: Familia (Group Relasi Inti Media).
- Hosnan, M. (2014). Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21. Bogor: Ghalia Indonesia
- Iraningtyas. (2013). Biologi untuk SMA/MA Kelas X. Jakarta: Erlangga
- Irwanto. (2002). Psikologi Umum. Jakarta: Prenhallindo
- Iswati, D. A. & Dwikoranto. (2015). Penerapan Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Siswa Pada Materi Fluida Statis Di Sman 1 Mojosari. Jurnal Inovasi Pendidikan Fisika (JIPF), 83-87.
- Kadri, M, & Rahmawati, M. (2015). Pengaruh Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Siswa pada Materi Pokok Suhu dan Kalor. Jurnal Ikatan Alumni Fisika Universitas Negeri Medan, 2461-1247.
- Kristin, F. (2016). Analisis Model Pembelajaran Discovery Learning dalam Meningkatkan Hasil Belajar Siswa SD. Jurnal Pendidikan Dasar PerKhasa. Pendidikan Guru Sekolah Dasar, Universitas Kristen Satya Wacana. Volume 2, Nomor 1, April 2016 Halaman 90-98.
- Kumalasari, D., Sudarti., & Lesmono, A. D. (2015). Dampak Model Discovery Learning Terhadap Keterampilan Proses Sains Dan Hasil Belajar Ipa-Fisika Siswa Di Mts Negeri Jember 1. Jurnal Pendidikan Fisika, 80-86.
- Mubarok, C. & Sulisty, E. (2014). Penerapan Model Pembelajaran Discovey Learning Terhadap Hasil Belajar Siswa Kelas X TAV Pada Standar Kompetensi Melakukan Instalasi Sound System Di SMK Negeri 2 Surabaya. Jurnal Pendidikan Teknik Elektro, 3, 215 – 221.
- Puspita, D. R., Saputro, A. N. C., & Ashadi. (2016). Penerapan Model Pembelajaran Discovery Learning untuk Meningkatkan Minat dan Prestasi Belajar Siswa Pada Materi Kelarutan dan Hasil Kali Kelarutan Kelas XI Mia 3 Semester Genap SMA N 1 Teras Tahun Pelajaran 2015/2016. Jurnal Pendidikan Kimia, Universitas Sebelas Maret. Volume 5, No 4, hal.115
- Rosarina, G., Ali, S., & Atep, S. (2016). Penerapan Model Discovery Learning Untuk

- Meningkatkan Hasil Belajar Siswa Pada Materi Perubahan Wujud Benda. Jurnal Pena Ilmiah. Program Studi PGSD Kelas UPI Kampus Sumedang. Volume 1, No.1 hal 371-380
- Sanjaya, W. (2011). Strategi Pembelajaran Berorientasi Standar Proses Pendidikan. Jakarta: Kencana Prenada Media.
- Susanti, E., Jamhari, M., & Seleman, M., (2016). Pengaruh Model Pembelajaran Discovery Learning Terhadap Keterampilan Sains Dan Hasil Belajar Siswa Kelas VIII Tentang Ipa Smp Advent Palu. Jurnal Sains dan Teknologi Tadulako, 36-41.
- Suyono. (2011). Belajar dan Pembelajaran. Bandung: Renika Cipta
- Trianto. (2014). Mendesain Model Pembelajaran Inovatif-Progresif. Jakarta: Kencana.
- Wahab, A. A. (2007). Metode dan Model- Model Mengajar. Bandung: CV Alfabeta.
- Widiyanti, F., Purwantoyo, E., & Irsadi, A. (2013). Efektivitas Metode Observasi dengan LKS Word Square Terhadap Aktivitas dan Hasil Belajar Siswa. Lembaran Ilmu Kependidikan, 42(2), 84-92.
- Widyastuti, E. S. (2015). Penerapan Model Pembelajaran Discovery Learning Pada Materi Konsep Ilmu Ekonomi. Prosiding Seminar Nasional 9 Mei 2015, Universitas Negeri Surabaya, hal.34.
- Wulandari, Y. I., Sunarto, & Totalia, S. A. (2015). Implementasi Model Discovery Learning Dengan Pendekatan Saintifik Untuk Meningkatkan Kemampuan Berfikir Kritis dan Hasil Belajar Siswa Mata Pelajaran Ekonomi Kelas XI IIS I Sma Negeri 6 Surakarta Tahun Pelajaran 2014/2015. FKIP Universitas Sebelas Maret Surakarta, hal.8.