Portrait of Pedagogical Content Knowledge (PCK) of Science Teachers in Global Islamic Boarding School Material Classification of Living Things

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Abstract: Pedagogical Content Knowledge (PCK) is a wedge between Content Knowledge and Pedagogical Knowledge, namely knowledge about the material being taught and how to teach it. The teacher's ability to understand the material and manage learning greatly determines the improvement of the quality of learning in the classroom in realizing meaningful learning for students. This study aims to describe the Pedagogical Content Knowledge (PCK) for science teachers at the Global Islamic Boarding School Middle School (GIBS) regarding the classification of living things. This type of research is descriptive qualitative. Data collection techniques using observation sheets, interviews and documentation. The results of the study show that teachers can balance between two competencies, namely knowledge of material classification of living things and how to teach it using 7 aspects of Pedagogical Content Knowledge (PCK), namely Content Knowledge, Knowledge of Specific Context, Knowledge of Learners and Learning, Pedagogical Knowledge, Curriculum Knowledge, Knowledge of General Education Context, Assessment Procedures, Evaluation of Outcomes – Educational Ends, Goals, Purposes, and Values.

Keywords: Classification of living things; Pedagogical content knowledge; Science teacher

Introduction

One of the determinants of the quality of national education is the quality of a teacher. Teachers are a factor in the quality of education (Canales et al., 2018; Harahap et al., 2020; Madani, 2019). According to Utami (2019), from UNESCO data the quality of teachers in Indonesia is ranked 14th out of 14 developing countries in the world. Meanwhile, the results of the Program for International Student Assessment (PISA) survey ranked the quality of education in Indonesia in the lowest order, which was ranked 72 out of 78 countries (Alifah, 2021).

Kaniyah et al. (2022) state that the quality of education in Indonesia can be answered by improving the quality of teachers. This is a challenge for educators

in an effort to improve the quality of education in Indonesia in strengthening students' interest in learning with the competence of a teacher. As is the case with science teachers who must have competence in understanding legal theory and science concepts and their application (Permendiknas, 2007). The success of science learning is not only supported by the teacher's expertise in presenting the material but the teacher can combine the material taught in the real life of students. The success of science learning that takes place in schools is closely related to teacher competence (Setiawan et al., 2018). This competency requires science teachers to have in-depth mastery and understanding of content and how to teach it (Carracedo et al., 2018; Ní

Ríordáin et al., 2019; Sorge et al., 2019; Tonova et al., 2021).

The ability to associate learning content with good teaching skills is called Pedagogical Content Knowledge (PCK) which is a concept in education that has the potential to improve the quality of education in Indonesia (Mulyadi et al., 2020; Prasojo et al., 2020; Rochintaniawati et al., 2018). PCK is a wedge between content knowledge and teacher pedagogic knowledge as special knowledge possessed by teachers about how strategies teach certain content which is the background for various decisions and responses to students' learning needs (Aminah et al., 2018; Dazrullisa, 2017; Kind et al., 2019; Zohar, 2023). In this case, Shulman said that Pedagogical Content Knowledge (PCK) is knowledge about the material being taught and how to teach it (Harahap et al., 2020).

Good Content Knowledge is mastery and in-depth understanding of the material on the subject as a whole. This must be balanced with Pedagogical Knowledge or the way of teaching and managing classes. Based on research from Purwaningsih (2015), Evens et al. (2018), and Gess-Newsome et al. (2019), most teachers experience difficulties in integrating Content Knowledge with Pedagogical Knowledge in learning. Lenhart (2010) argued that the better the teacher's Pedagogical Content Knowledge (PCK), the better the learning outcomes of students.

One of the schools located in South Kalimantan requires and requires every teacher to master four competencies according to Permendiknas standards No.16 of 2007. Pedagogical Content Knowledge (PCK) is one of the four competencies that must be mastered by someone at Global Islamic Middle School-SMA Boarding School (GIBS) which stands under the auspices of the Hasnur Center Foundation with teacher quality criteria determined by mastery of Pedagogical Content Knowledge (PCK). There are 7 aspects in Pedagogical Content Knowledge that are used in GIBS including: 1) Content Knowledge, teacher's knowledge of the material being taught; 2) Knowledge of Specific Context, the teacher's knowledge in presenting the learning context; 3) Knowledge of Learners and Learning, teachers' knowledge of their students and teaching methods; 4) Pedagogical Knowledge, the language used by teachers in conveying instructions in class; 5) Curriculum Knowledge, teacher's knowledge of the connectedness of one content to other content; 6) General Education Context, the teacher's decision in deciding how much material to teach; 7) Assessment Procedures, Evaluation of Outcomes – Educational Ends, Goals, Purposes and Values, namely the teacher's knowledge of the procedure for assessing their students and the teacher's knowledge to evaluate the results of the learning process.

The teacher's ability to understand material and manage learning greatly determines the improvement of the quality of learning in the classroom, so that a teacher must have a qualified ability to implement Pedagogical Content Knowledge (PCK) in each teaching process, so that students do not only know knowledge in the material being taught, but also knowing every meaning contained in the learning process (Alimuddin et al., 2019). This study aims to describe the Pedagogical Content Knowledge (PCK) of science teachers at the Global Islamic Boarding School (GIBS) Middle School

Method

This research is qualitative with the method used descriptive qualitative to describe an incident (Sumadi, 1995). This research was conducted on the Pedagogical Content Knowledge (PCK) of science teachers at the Global Islamic Boarding School Middle School, Batola, South Kalimantan on class VII living things classification materials. The data collection techniques used in this study were initial observation, direct observation, interviews and documentation. Data analysis techniques using data reduction, data presentation and drawing conclusions.
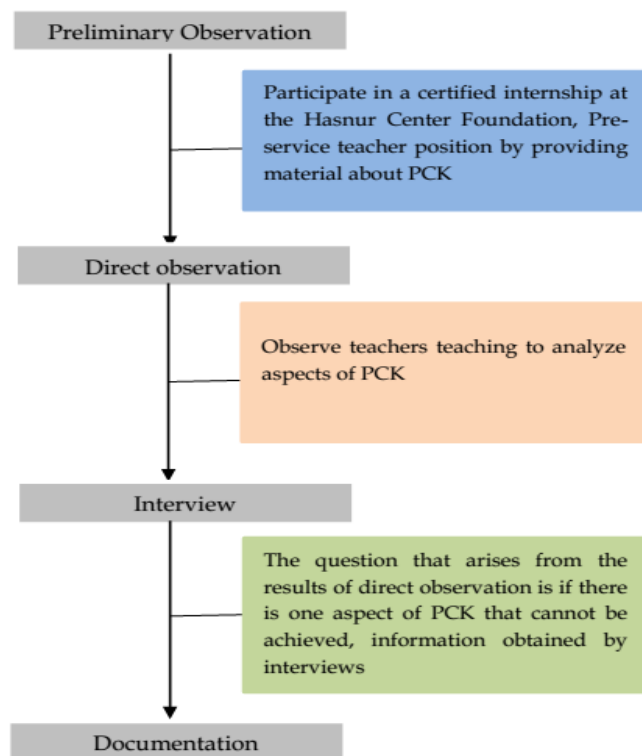

Figure 1. Data collection technique

Result and Discussion

The formal education institution for Middle-High School Global Islamic Boarding School (GIBS) was

established as a form of the Hasnur Center Foundation's dedication to human resource development in Banua. With the hope that the process of forming the character of the Indonesian generation will be more intensive, which is loaded with life values that the founder of the Hasnur Center Foundation, the late H. Abdussamad Sulaiman HB, strongly believes in. At GIBS the Learning Implementation Plan (RPP) is poured into teaching modules and practiced in the Pedagogical Content Knowledge (PCK) learning process. The following is a description of Pedagogical Content Knowledge (PCK) for science teachers using 7 aspects:

Content Knowledge

Content Knowledge is knowledge of the subject matter being taught. Researchers see that Content Knowledge is important which aims to provide an understanding of the subject matter in the learning process. Without good Content Knowledge, the process of transforming subject matter which aims to build students' knowledge does not go well. Content Knowledge in the form of knowledge content or what will be taught to students, namely the teacher's way of describing a material where the teacher's thoughts in developing learning material are related to one another.

Before entering class to teach a teacher must prepare aspects of Content Knowledge, namely what material will be taught by the teacher. In this aspect the teacher determines the topic to be taught, namely the classification of living things. In the learning process, the topic is conveyed after the learning context, namely the grouping of living things. After that the teacher also analyzes the keywords and concepts of material classification of living things. The keywords used are the characteristics of living things. While the concepts written in the teaching module are in the concept & meaningful understanding section as follows.

2. KONSEP & PEMAHAMAN BERMAKNA

Konsep   : Klasifikasi
               Kemampuan mengelompokkan sesuatu berdasarkan ciri-ciri khusus yang dimiliki.

Figure 2. Module teaching meaningful concepts & understanding

In the Content Knowledge aspect, one of them is creating a thinking flow or the flow of the teacher's thinking on the material to be taught. In the material for the classification of living things, the teacher does not make thinking flow because the flow of thinking is poured directly into the teaching module as a guide for the activities carried out by the teacher while teaching in class as follows.

Key Instructions and activity:

1. Guru menyiapkan perangkat pembelajaran dan worksheet yang diperlukan dalam proses pembelajaran dan membuka kelas dengan salam.
2. Anak-anak hari ini kita mau belajar tentang benda-benda yang ada kita. Pertama-tama amatilah benda-benda yang ada disekitar kalian, tulislah minimal 25 benda-benda yang terlihat oleh mata kalian ke dalam worksheet yang sudah dibagikan.

No.	Nama benda yang terlihat	Makhluk hidup	Benda Tak Hidup
1	Meja		
2	Pohon		
3	Pulpen		
4	Batu		
5	Bunga		
dst			

3. Setelah kalian selesai menuliskan benda-benda tersebut, coba kalian beri tanda (√) apakah benda-benda tersebut merupakan makhluk hidup atau benda tak hidup.

No.	Nama benda yang terlihat	Makhluk hidup	Benda Tak Hidup
1	Meja		√
2	Pohon	√	
3	Pulpen		√
4	Batu		√
5	Burung	√	
dst			

4. Setelah siswa menandai benda-benda tersebut langkah selanjutnya adalah tuliskan dibuku tulis kalian ciri-ciri yang terlihat dari setiap benda-benda yang kalian tuliskan tadi (minimal 10 benda).

Meja	Bentuknya kotak, keras dan padat, tidak bisa bergerak sendiri
Pohon	Dapat tumbuh dan berkembang, butuh air, berwarna hijau, tidak bisa bergerak
dst.	

5. Kemudian setelah siswa menuliskan semua ciri-ciri yang mereka ketahui maka bisa dilanjutkan dengan diskusi hasil worksheet.
   a. Berapa banyak benda yang kalian temui yang masuk ke dalam kelompok makhluk hidup? Berapa banyak benda yang termasuk ke dalam benda tak hidup? (FC1)
   b. Dari semua benda yang termasuk ke dalam kelompok yang sama, apakah mereka memiliki kesamaan ciri-ciri? (FC2)
   c. Menurut kalian dari semua ciri-ciri yang kalian temui dari benda-benda tersebut mana sajakah yang menunjukkan ciri-ciri makhluk hidup? (CC1)
   d. Sekarang coba kalian simpulkan dari hasil diskusi kalian, jadi syarat suatu benda untuk bisa dikatakan makhluk hidup harus mempunyai berapa ciri-ciri? Apakah harus memiliki semua ciri-ciri tersebut baru bisa dikatakan makhluk hidup? (CC2)
6. Selanjutnya guru akan menjelaskan 7 ciri-ciri khusus yang biasanya dimiliki oleh suatu makhluk hidup.
7. Setelah siswa mengetahui dan mempelajari ciri-ciri tersebut, guru menampilkan beberapa gambar di slide ppt. Siswa diminta untuk mengelompokkan gambar-gambar tersebut ke dalam makhluk hidup dan tak hidup berdasarkan 7 ciri-ciri yang sudah dipelajari. *(assessment)*
8. Siswa dibagi menjadi 4 kelompok untuk melakukan games singkat. Masing – masing kelompok mendapatkan 1 set gambar (gambar yang sebagian besar tidak pernah mereka lihat dan temui secara langsung).

Siswa diberikan instruksi bahwa dalam waktu 1 menit silahkan mengelompokkan gambar-gambar tersebut ke dalam 2 kelompok yaitu makhluk hidup dan benda tak hidup. Kegiatan games diulang beberapa kali sampai siswa bisa mengelompokkan dengan benar. *(assessment)*
9. Berdasarkan kegiatan games tersebut, siswa diminta untuk menjelaskan mengapa gambar-gambar tersebut mereka kelompokkan kedalam makhluk hidup atau benda tak hidup. Ciri-ciri apa saja yang menjadikan benda-benda pada gambar tersebut merupakan makhluk hidup? Ciri-ciri apa saja yang membuat benda tersebut merupakan benda tak hidup? (CC3)
10. Guru menampilkan 2 gambar yang memiliki bentuk dan kenampakan yang mirip tetapi satu merupakan makhluk hidup dan yang satu lagi merupakan benda tak hidup. Siswa diminta untuk membandingkan dan membedakan makhluk/benda yang terlihat hidup padahal tak hidup ataupun sebaliknya berdasarkan keseluruhan ciri-ciri yang dimiliki. (CC4)

Figure 3. Teaching module key instructions and activity

This is in line with Purwoko's research (2017) that the teacher's ability to understand material and manage learning greatly determines the improvement of the quality of learning in the classroom.

Knowledge of Specific Context

Knowledge of specific context is an experience that students have or phenomena that are often experienced by students related to the material to be discussed by the teacher, so that students feel involved in the learning process and can attract students' interest during learning. The importance of context because if the teacher gives examples of situations that are directly related to the material the students will easily remember the material presented can bridge the material with the perceptions of the students.

In the learning process the teacher brings the context according to the teaching module, namely using several objects around the students.

"Take a look, what objects are around you?"
"What's the difference between the study table and us?"
"Does the study table include living things?"
"Which things include living things and non-living things?"
"What are the characteristics that determine that something we encounter around us is a living thing or an inanimate object?"

After opening with the context the teacher enters learning by distributing worksheets.

"Today's children, we want to learn about the things we have. First of all observe the objects that are around you, write at least 25 objects that are visible to your eyes into the worksheets that have been distributed."

Knowledge of Learners and Learning

Knowledge of Learners related to students. The extent to which the teacher understands students so that learning is more effective. This means that the teacher must be sensitive in reading the situations and conditions of the students so that the teacher can provide effective methods or steps so that the transfer of knowledge is maximized. Knowledge of the learner regarding the situation and environmental conditions and even the characteristics of the students so that the lessons prepared by the teacher can suit the students. Teachers know the characteristics of their students, learning activities are more meaningful and enjoyable by knowing the strengths and weaknesses of each student in their class (Caulfield, 2023; Malone et al., 2021; Setiawan et al., 2018).

The teacher must consider a number of things related to this aspect for students, namely prior knowledge or initial knowledge that students must master before studying the material for the classification of living things, namely students can identify and show

which objects include living things and non-living things.

One of the student learning styles is auditory which tends to listen to the teacher's explanation, in this case the teacher uses objects in the surrounding environment as material for discussion.

a) How many things did you encounter that belong to the category of living things? How many things are included in non-living things?
b) Of all the things that belong to the same group, do they have the same characteristics?
c) In your opinion, which of all the characteristics that you found from these objects show the characteristics of living things?
d) Now try to conclude from the results of your discussion, so what are the requirements for an object to be said to be a living being?
e) Does it have to have all these characteristics to be said to be living things?

Furthermore, the teacher explains the 7 special characteristics that are usually possessed by a living thing, namely breathing, moving, needing to eat and drink, responding to stimuli, multiplying, growing and developing and removing waste substances.

The visual learning style uses pictures that students do not encounter in everyday life. The teacher shows 2 pictures that have a similar shape and appearance but one is a living thing and the other is an inanimate object. Students are asked to compare and differentiate creatures/objects that look alive when they are not alive or vice versa based on their overall characteristics.

The teacher also uses a kinesthetic learning style by using game activities to understand learning as follows.

Figure 4. Card games

Students are divided into 4 groups to do short games. Each group gets 1 set of pictures (pictures that most of them have never seen or encountered in person). Students are given instructions that within 1 minute please group the pictures into 2 groups, namely living

things and non-living things. Game activities are repeated several times until students can group them correctly. Based on these game activities, students were asked to explain why they grouped these pictures into living things or non-living things. What characteristics make the objects in the picture living things? What characteristics make it an inanimate object?

The knowledge of learner's aspect is then part of the learning outcomes of students in the Low Achiever (LA), Middle Achiever (MA) and High Achiever (HA) groups. In the Low Achiever (LA) group, students were able to complete questions and discuss at the CC2 level, namely concluding how many characteristics an object must have in order to be grouped into living things. Meanwhile, in the Middle Achiever (MA) group, students were able to complete questions and discuss at the CC3 level, namely classifying something they encountered in the environment/pictures of other objects into groups of living and non-living things based on their characteristics. The High Achiever (HA) group of students is able to solve questions and discuss at the CC4 level, comparing and differentiating creatures/objects that look alive but not alive or vice versa based on their overall characteristics.

Knowledge of Learning is a teacher's trick or method used in providing teaching by considering the characteristics of students in the learning process in the classroom. Teachers can prepare appropriate learning

activities, can design and determine the media used, and assistance provided to students, making it easier for students to understand the content because the way it is delivered is in accordance with the level of learning of students. This is in line with research from Setiawan et al. (2018), Lau et al. (2018), Eze et al. (2018), and (Widodo et al. (2018) that the learning media used by teachers adapts to the facilities provided by the school and learning resources.

Teaching aids used to support learning are in the form of worksheets, objects in the surrounding environment (that are visible to the eye), images displayed through a projector and game cards. In addition, the activities carried out were in the form of discussions, question and answer, doing exercises and conducting card games and presentations of card game activities. This is in accordance with the research of Wentzel (2014), Bakar (2018), Lawrence et al. (2018) that the teacher's activity in the classroom greatly influences student learning success.

The learning model used in the classification of living things is the 5Es Teaching and Learning Model. This is in accordance with research from Suryana (2013), Amtu et al. (2020), and Fauth et al. (2019) that teachers' teaching knowledge includes learning strategies, attitudes and motivation that influence student learning outcomes.

Table 1. 5Es Teaching and Learning Model

Phase	Focus	Assessment Focus
Engage	Engage student and elicit prior knowledge	Diagnostic assessment
Explore	Provide hands-on experience of the phenomenon	Formative assessment
Explain	Develop scientific explanations for observations and represent developing conceptual understanding consider current scientific explanations	Formative assessment
Elaborate	Extend understanding to a new context or make connections to additional concepts through a student-planned investigation	Summative assessment of the science inquiry skills
Evaluate	Students re-represent their understanding and reflect on their learning journey, and teachers collect evidence about the achievement of outcomes	Summative assessment of the science understanding

This can be seen in the learning process, namely at the beginning of learning the teacher involves students with their initial knowledge by asking students to write the names of objects around them. Then provide direct experience of the object by seeing it directly. From the results of these observations, discussions and teacher explanations were carried out. Followed by expanding understanding by displaying pictures and students are asked to group them. Besides that, with a card game that contains pictures of living and non-living things, students are divided into groups with the task of grouping pictures that include living and non-living things. Based on these games, students were asked to explain why they grouped these pictures into living and non-living things. The learning method used by the

teacher has a direct effect on student learning outcomes so that it is used in educational research (Fischer et al., 2019; Lotulung et al., 2018; Solihin et al., 2021).

Pedagogical Knowledge

Pedagogical knowledge is the teacher's knowledge in giving instructions clearly, using a choice of words that are easy for students to understand in their daily language and when delivering instructions there are pauses or fragments of words so that students more easily understand the directions given. A teacher must have pedagogical knowledge because in the teaching process the teacher must be able to communicate effectively in giving instructions to students, for example when giving questions in stages, without good

pedagogical knowledge, the process of transforming the subject matter will not take place properly so that a process is not created effective teaching and learning as follows.

> *"Children, today we are learning about objects around us. First of all, observe the objects around you."*

Students observe the objects around them, then the teacher continues the next instruction.

> *"Then, write at least 25 objects that are visible to your eyes, onto the worksheets that have been distributed."*

Students carry out the instructions given, the teacher stops giving instructions and after seeing that the students have started to finish working, then the teacher gives further instructions.

> "*After you write down these objects, try to put a check mark, whether these objects are living or non-living things.*"

Students carry out the second instruction, the teacher stops giving instructions and after seeing that the students have started to finish working, then the teacher gives further instructions. Similarly, when discussing worksheet results, the teacher asks questions, after students answer questions and discuss, then the teacher gives the next question.

> "*How many objects did you encounter that belong to the category of living things?*" (*Students answer and discuss*)
> "*How many objects did you encounter that belong to the category of living things?*" (*Students answer and discuss*)

In this case the teacher gives gradual instructions until the discussion is complete. The teacher must have pedagogical knowledge because the level of language or diction possessed by the teacher is different from the students and to attract students' interest in learning. With pedagogical knowledge, it is easier for teachers to establish communication with students so that the transfer of knowledge becomes effective because the teacher has succeeded in simplifying the language. Pedagogical knowledge can be said to be the language used by the teacher when teaching which aims to attract students' interest in learning by providing foreign terms to add to students' new vocabulary.

Curriculum Knowledge

Curriculum knowledge is the linkage of the material being taught with subsequent material or other subjects. There are three steps in compiling a curriculum knowledge, namely considering prior knowledge of the material being taught, determining the distribution of the material being taught, and selecting material from other related subjects and having the same concept. Here the teacher connects the material on the classification of living things with other lessons, namely Social Sciences (IPS) that living things are interrelated with one another.

This can also be seen in the questions presented as follows.
a) Although divided into groups of living things and non-living things, can all these things coexist together?
b) Imagine if you lived in a place where only living things existed, what would happen?
c) On the other hand, if we live in a place where there are only non-living things, what will happen?
d) What can we do so that the two groups can live side by side without harming each other?

From the question it leads to living and non-living things side by side and this can also be seen from the students' answers that living things and non-living things coexist together. Shows living things that need other creatures to support life.

Curriculum knowledge is important because it can be used as a material map so that the learning flow becomes more directed, and as input to find out what material students have not mastered so that before continuing the material the teacher can repeat material or teach again previous material related to the material being taught.

Knowledge of General Education Context

The general educational context is an important aspect that can make learning effective, aspects that need to be considered or the teacher's decision in deciding how deep and broad the material is taught. The depth of content is how complex the subtopics are discussed in class and the breadth of content is how many subtopics are discussed in class. The amount of material presented is adjusted to the learning outcomes (CP) intended for the teaching module as follows.

Capaian Pembelajaran IPA :

Pada akhir fase D, peserta didik mampu melakukan klasifikasi makhluk hidup dan benda berdasarkan karakteristik yang diamati.

Figure 5. Teaching module science learning outcomes

The description of the contents is shown in Figure 6. The aspects underlying the teacher's decision in deciding how much material to teach from the number of hours of lessons (JP) in 1 meeting so that the teacher must be able to allocate time in teaching. At the Global Islamic Boarding School Middle School, one hour of study is only 35 minutes and for science subjects each class only meets once a week with an allotted time of two hours of study, namely 2 x 35 minutes or 70 minutes per week.

The number of students in 1 class greatly influences the effectiveness in delivering the material being taught. At SMP Global Islamic Boarding School the number of

students tends to be conducive where each class has around 12-15 students.

Figure 6. Content explanation teaching module

The condition of students in capturing material needs to be considered because students who have high achievers will more easily understand the material being taught than students who are middle achievers, and students who are low achievers will find it more difficult to understand the material being taught, so it is necessary to consider the amount of material composition taught. At SMP Global Islamic Boarding School it is not how much material has been taught but how much students understand the material being taught. Schools do not demand that in one semester how many chapters have been completed, but how well students have mastered the material being taught.

Class facilities such as labs, teaching aids, media and others are aspects that also need to be considered because nature makes it easier to convey material. Where in SMP Global Islamic Boarding School has complete facilities to support the learning process.

Assessment Procedures, Evaluation of Outcomes–Educational Ends, Goals, Purposes, and Values

Assessment Procedures, Evaluation of Outcomes – Educational Ends, Goals, Purposes and Values, namely the teacher's knowledge of the procedure for assessing their students and the teacher's knowledge to evaluate the results of the learning process. In the Assessment procedures section it is important because teachers also have to carry out assessments to evaluate student progress whether the content we provide is understandable to students and the learning process is effective. If a teacher only thinks about content related to teaching material, its relation to other material without thinking about aspects that need to be considered such as the duration of time and the depth of the material or the breadth of the material where for example the material delivered is not delivered even it is still lacking from basic competence.

From the results of observations for the material for the classification of living things, the teacher uses a written, individual and group assessment pattern that is carried out throughout the learning process, namely the teacher distributes worksheets and asks students to write at least 25 objects visible to the eye into the worksheet. After students know and learn the characteristics of living and non-living things, the teacher displays several pictures on the projector. Students are asked to group the pictures into living and non-living things based on the 7 characteristics that have been studied individually. Followed by a group assessment on card games by grouping the pictures into 2 groups, namely living things and non-living things. As for student assessment, it can be seen from how complete the student's notes and answers are on the worksheet.

Before making an assessment sentence, the teacher must first have learning objectives using the AKT (Anderson Krathwohl Taxonomy) along with the flow of learning objectives. The following are the learning objectives for the classification of living things.

Figure 7. Teaching module formulating learning objectives

The flow of learning objectives is shown in Figure 8. The following is an assessment sentence using AKT (Anderson Krathwohl Taxonomy).

FC1: How many things did you find that belong to the category of living things?
How many things are included in non-living things?

FC2: Of all the things that belong to the same group, do they have the same characteristics?

CC1: In your opinion, which of all the characteristics that you found from these objects show the characteristics of living things?

CC2: Now try to conclude from the results of your discussion, so how many characteristics must an object have to be considered a living being?

Does it have to have all these characteristics to be said to be living things?

ALUR TUJUAN PEMBELAJARAN

Alur Pembelajaran menuju TP 1 (CC2) dan TP 2 (CC4)
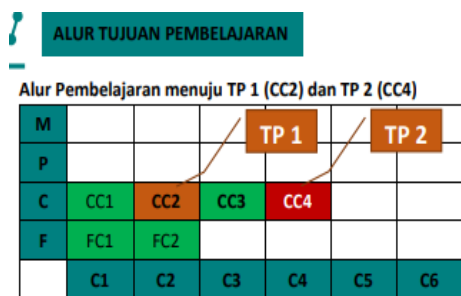
Langkah – langkah Alur Tujuan Pembelajaran (ATP) :

1. FC1 : Menyebutkan semua benda yang ada di lingkungan sekitar (Intro & Bridging).
   Mengidentifikasi dan menunjukkan benda-benda mana saja yang termasuk makhluk hidup dan makhluk tak hidup (Prior Knowledge Test).
2. FC2 : Menunjukkan dan menuliskan ciri-ciri umum yang terlihat dan diketahui secara langsung dari masing-masing benda yang ditemui.
3. CC1 : Menentukan ciri-ciri mana saja yang menunjukkan ciri-ciri makhluk hidup dan tak hidup.
4. CC2 : Menyimpulkan berapa banyak ciri-ciri yang harus dimiliki oleh suatu benda supaya bisa dikelompokkan menjadi makhluk hidup.
5. CC3 : Mengklasifikasikan sesuatu yang mereka temui di lingkungan/ gambar-gambar benda lain ke dalam kelompok makhluk hidup dan tak hidup berdasarkan ciri-cirinya.
6. CC4 : Membandingkan dan membedakan makhluk/benda yang terlihat hidup padahal tak hidup ataupun sebaliknya berdasarkan keseluruhan ciri-ciri yang dimiliki.

Figure 8. Teaching module flow of learning objectives

In the evaluation of outcomes section, the educational goals and end stage is usually known as basic competencies, namely competencies that are formed in students after studying material on the classification of living things. The educational goals and end section shows that after the learning process of classifying living things students can explain and determine the characteristics of something they encounter in their surroundings. Furthermore, students can compare/distinguish an object/creature that is similar whether it includes living things or non-living things based on the characteristics they have.

In the Educational Purposes section, namely changes in knowledge/attitude/skills obtained after studying the classification of living things, namely after students understand well the concept of classification of living things, students more easily understand the next material, namely material classification. The ability of students to classify living and non-living things based on their characteristics. In addition, the Educational Value section is the essence of the classification of living things in the form of characters that can be instilled in students. The achievements of Character Learning

include students being able to be responsible for the whole process and learning outcomes for themselves, friends and teachers. Students are able to foster a sense of mutual respect and respect in the learning process and apply it in an environment outside the classroom. Students are expected to grow and strengthen a sense of caring for others and all those involved in the learning process. This is in line with the research of Abi et al. (2020) where teachers pay attention to the logical order of learning materials and understand each learning objective they make and their application in everyday life.

Conclusion

The results of this study describe the achievements of the seven indicators of Pedagogical Content Knowledge with the following details. Content Knowledge: compiling material for the classification of living things by analyzing keywords and concepts of the material to be taught. The teacher does not use Thinking flow material for classification of living things, but uses guidelines for learning activities. Knowledge of Specific Context: the context used is in the form of objects around students that are associated with the characteristics of living things. Knowledge of Learners and Learning: teach using prior knowledge, learning styles, and CP in the HA, MA and LA groups with the 5E learning model. Pedagogical Knowledge: convey instructions clearly and break each instruction given using students' everyday language. Curriculum Knowledge: the teacher connects material on the classification of living things with social studies lessons that living things are interrelated with one another. General Education Context: the teacher limits material to classification and distinguishes between living and non-living things based on their special characteristics based on considerations of duration, number of students, condition of students and school facilities. Assessment Procedures, Evaluation of Outcomes – Educational Ends, Goals, Purposes and Values: assessing students individually, in groups, debriefing and writing throughout the lesson with assessments from FC1 to CC4. So that Educational Ends, Goals, Purposes and Values can be achieved. Overall, it shows that teachers can balance between the two competencies, namely knowledge of material classification of living things and how to teach it using the 7 aspects of PCK. As a teacher it is expected to be able to use PCK in learning.

Author Contributions

The authors in this research are divided into executor and advisor.

Conflicts of Interest

The authors declare no conflict of interest in this research.

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