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Article

Perceptions of Prospective Teachers on Basic Competencies in Science at Madrasah Ibtidaiyah

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ABSTRACT

Professional teachers have personality competencies, pedagogical, social and professional competencies. One indicator of a professional teacher is if the prospective teacher masters the basic competencies (BC) of the subject being taught. Mastery of BC in the curriculum is very important, so that prospective teachers can plan learning by describing BC into indicators and learning objectives. The depth and breadth of the material available determines the teacher's ability to understand these competencies. Quantitative descriptive research using survey techniques (46 respondents) was conducted to analyze prospective teachers' perceptions of BC which includes cognitive competence and skills competence. The research steps began with preparing a questionnaire in Google Forms (50 Questions) which had been validated by science education experts. Questionnaires were distributed to prospective teachers. Data was analyzed using percentages. The research results showed that prospective madrasa teachers stated that BC skills were more difficult to understand and teach than cognitive BC. The most difficult BC to understand and teach to students in class IV is material about life cycles. In class V, the most difficult are single substances and mixtures. The most challenging material for prospective teachers to understand and teach in class VI is electricity.

INTRODUCTION

A teacher is a type of profession important in increasing intelligence generation in a country. Teach is gloriously to educate all citizens, so a teacher should provide knowledge, skills, and attitudes to transmit the knowledge to students (Ledun et al., 2018; Tafonao, 2019). Besides having skills in field knowledge, the teacher should have many abilities to push students to develop cognitive aptitude, interest, and emotion (Irawatie et al., 2019). So that generates the perfect human after getting science on the bench school, so a teacher must be professional (Hartono, 2019). Professional teachers influence the learning process's success (Gess-Newsome et al., 2019; Makovec, 2018). Professional teachers must have many abilities

to manage the learning process. Professionalism is determined mainly by the teacher's previous education and experience while becoming a teacher. No one can be denied that background teacher education is very decisive in teacher teaching abilities and abilities the content it has (Sintawati & Indriani, 2019). Teacher professionalism is profitable in the process of learning and improving accreditation schools. One of the determining factors of a quality school is that professional teachers are in it, so the learning process walks well and produces graduates of superior.

A professional teacher is someone with expertise in the field of pedagogics and capable of teaching with Good (Hamid, 2017; Jarvis, 2018). The difference between professional and amateur teachers, including teaching, is not only just looking for a living but calling their soul to serve sustainability knowledge and devotion. The characteristics of a professional teacher are control knowledge in the field and extensive knowledge (Makovec, 2018; Omar et al., 2020; Purwanto, 2019). According to teacher and lecturer law, professional teachers have competent personalities, pedagogic, professional, and social (Darmadi, 2016; Idris, 2020). A teacher must have Competence Professional (Orishev & Burkhonov, 2021). Competence is a teacher's mastery of the material in his field in a manner broad and deep in a manner theoretical or practical (Wachidi et al., 2020). Madrasah ibtidaiyah class teacher must control structure science and methodology science (Delimanugari et al., 2022).

Student prospective school teacher foundation and madrasah ibtidaiyah must control professional competence so they can teach well. Mastery curriculum for a student is an absolute thing because the curriculum is based on teaching material at school (Palupi, 2018; Sudargini & Purwanto, 2020). Mastery student prospective teachers on competency base in curriculum absolute thing (Julia et al., 2020; Prasetyo et al., 2021), though results from interviews and results Study Student at the time follow basic science courses in categories medium. Core competencies outlined in competence-based load knowledge and skills following subjects. On competence base knowledge. There is complex material for understanding prospective teachers. Even teachers with many years of teaching experience need help with teaching material-specific (Wakhidah, 2016b; Wakhidah et al., 2016, 2020b).

Mastery competence basis (BC) is essential for teachers (Nengrum et al., 2021). For mastery of science, a teacher's competence base is needed so teachers can design teaching materials and sheets of work, select the appropriate strategy/model/method, and develop assessment instruments. Understanding that competence is a good foundation because the teacher can formulate indicators and goals for learning (Arifuddin et al., 2019; Palobo & Tembang, 2019). Competence base load material is following field studies, but the teacher must operationalize competency-based goals and indicators. Many prospective teachers still need help for lower or describing competence based on indicators and goals. Difficulties also occur during moment compile grid evaluation (Janati et al., 2018). This is related to hassle and complexity material contained within the Competence base, especially in science material.

Many science materials are complex to study, although close science material with living humans and nature is surrounding because natural science materials are complex and abstract (Insani, 2017; Wakhidah, 2016a). Student moment follows studying feel difficulty moment learn materials certainly. Knowledge nature are clumps science consisting of physics, chemistry, and biology field knowledge. All field knowledge is very close to the life of humans. Phenomenon naturally happens every moment, even in our bodies. For example, when we feel hungry and have movement involving the body's work nerves. Everyone feels hungry. If no eat and taste sick moment pinched. However, the phenomenon involves difficult, abstract, and complex concepts seen with the eye so difficult studied by students, even prospective teachers. Clump, especially science, physics, and chemistry, loads lots of calculations, making learning difficult. Physics is challenging to study because it exists different formulas and representations (Ornek et al., 2007). Difficult science physics material including force, electricity (Guisasola

et al., 2004), and energy (Erinosho, 2013); motion, electricity, and magnetism (Şahin & Yağbasan, 2012). Material complicated biology is diverse creature life, reproduction, digestive system, circulatory system blood, respiration, excretion, and photosynthesis (Atilla, 2012; Bahar, 2002; C Tekkaya, 2002; Ceren Tekkaya et al., 2001). Challenging prospective teachers to understand basic competency in the curriculum will impact their abilities momentarily teach later. Identification of difficulty prospective teachers in understanding competence base can be as a ground for studying advanced necessary material studied in learning by using specific strategies and media so that complex material can be taught in a manner easily.

METHODS

This tudy using the mixed method with exploratory design (Creswell, 2007; Fetters et al., 2013; Ure et al., 2012). This method was used because previous research (Wakhidah, 2016) showed that there were difficulties for teachers in teaching science material at madrasah ibtidaiyah. These results are used as a basis for exploring prospective teachers' abilities based on prospective teachers' perceptions of BC in the curriculum. The study started with a discussion with the students, a purpose for identifying the problematic science material basic competence in the curriculum. Basic competence is the minimum required skill mastered, so teachers and prospective teachers must master it. Discussion results were analyzed and used to define the quantitative instruments method. The method used to know the prospective teacher's perception of BC in the curriculum. The survey results are analyzed to know the perception of prospective teachers. Perception shows a difficult BC understood by prospective teachers, including method designing learning. Kindly short-channel mixed methods research with the exploratory design presented in **Figure 1.**

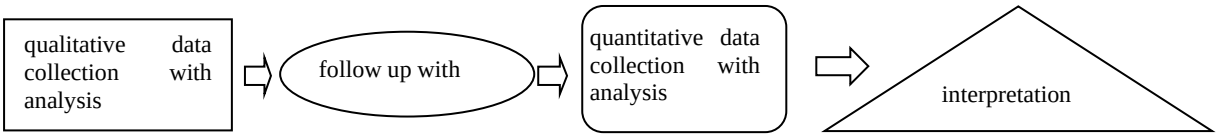

Figure 1. The Mixed Method with Exploratory Design

A study was conducted on students of the Madrasah Ibtidaiyah Teacher Education study program at UIN Sunan Ampel Surabaya. Respondents are students of the madrasah primary school teacher education study program who have taken basic science courses, lesson planning, and science learning courses so they can science content and pedagogic skills including compiling indicators based on basic competencies. The population consisted of all PGMI students total is 480 people, a sample of 46 people consisting of 6 men and 40 women with a purposive sampling technique. The demographics of the respondents are as follows in **Table 1**.

Table 1. Respondents Demographics

No		Percentage
1	Amount	
	Man	13 %
	Woman	87 %
2	Secondary School	
	Public School	35%
	Private School	48%
	Vocational School	17%
3	Departemen of Secondary School	
	Science	34%
	Social	67%
	Religion	9%

Questionnaires and interviews are deep data collection techniques to study this. The questionnaire was prepared according to the research objectives and referred to the basic competencies in the 2013 Curriculum. Each statement was followed by answers on Likert

scales. Respondents were not asked to write down their answers because this study only examined students' perceptions of difficult BC. Guidelines interviews were used to deepen the results questionnaire that has been analyzed descriptive quantitative. A questionnaire developed competence existing BC in the curriculum. The Basic Competency for every class is shown in **Table 2.**

Table 2. Science Topics in Madrasah Ibtidaiyah

Class	No	Material in Basic Competency
IV	1	Form and Function of Plant
	2	Life Cycle
	3	Force
	4	Force and motion
	5	Energy
	6	Sound
	7	Light
	8	Resource Natural
V	1	organs of movement and their functions
	2	Respiratory system
	3	Digestive system
	4	Circulation system blood
	5	Ecology
	6	Heat Transfer
	7	Heat and change
	8	water cycle
	9	Substance and mixed
VI	1	Reproduction
	2	Reproductive Health
	3	Adaptation
	4	Electricity
	5	Magnets
	6	Energy Saving
	7	Solar system
	8	Rotation and revolution of earth

The research step started with drafting a questionnaire. Questionnaires in form google Forms furthermore shipped to prospective teachers for filling. Questionnaires were distributed to students while attending the "capita selecta of science" lecture so that students had enough time to work on the questionnaire. Before the Google form was distributed and filled in by students, the researcher explained the purpose of filling out the questionnaire. Respondents who filled in the questionnaire were analyzed with descriptive quantitative analysis. In-depth interviews were conducted to verify the respondents' answers about difficult BC by prospective teachers. The interview guidelines used as data to complete the questionnaire results are shown in **Figure 2.**

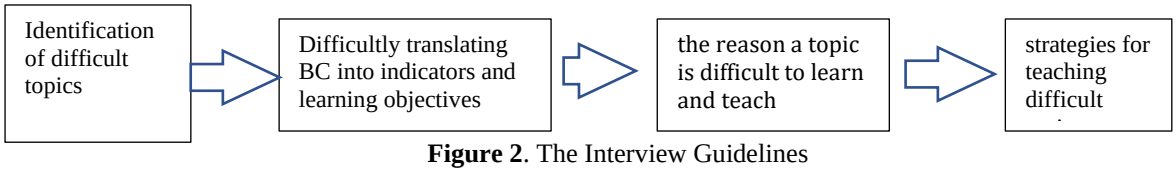

Figure 2. The Interview Guidelines

Respondents who filled in the questionnaire were analyzed with descriptive quantitative analysis (Carver, 2016). The tall percentage on each grain questionnaire indicates BC is having difficulty understanding and designing learning.

RESULTS AND DISCUSSION

Perception of prospective teachers about competence base is very diverse depending on the material in BC and the type of BC, what is BC knowledge or BC skills. As many as 42.5%

answered material form and function plant on basic competence difficult for taught. A total of 47.9% of candidates state easy to teach source energy, change form energy, and energy alternative and 32.6% of prospective teachers stated that serving reports about energy alternatives are easily done in the learning process. Sounds and senses of hearing with easily taught by prospective teachers. As many as 47.8% of prospective teachers stated that sounds easy for taught. Teach Skills For serve report about sound and senses hearing more difficult from teaching content material. As many as 39.1% of prospective teachers easily teach the material. properties light is a relatively difficult material Because only 43.5% of teacher candidates stated that material This easy to teach in class. As many as 32.6% of prospective teachers feel easy to teach tests about the properties of light. As many as 15.2% of prospective teachers stated that material resources are naturally difficult to teach. As many as 18.5% of students consider that material resources naturally difficult moment held activity together society.

Science material in class IV contains material about the form and function of creature life, cycle life, force and motion, source energy, sound, light, and sources of power in nature. Difficulty-level students understand competence basic skills are presented in **Figure 3.**

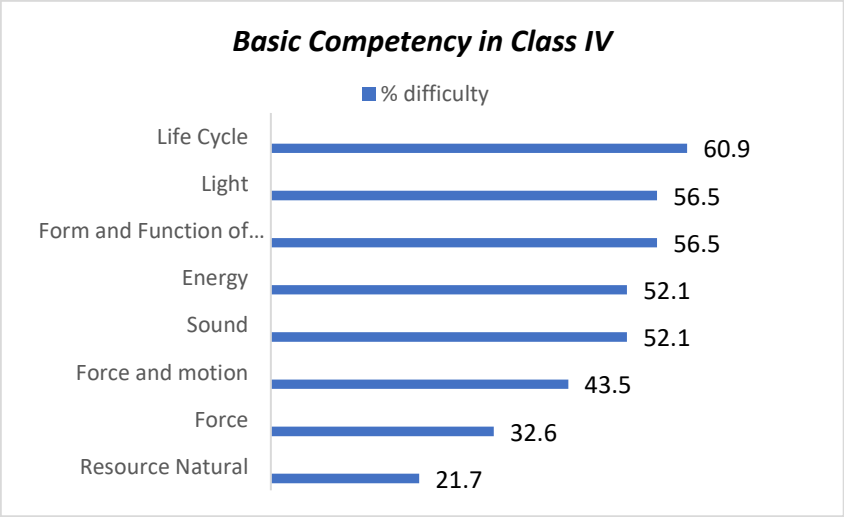

Figure 3. Percentage Difficulty Teacher Prospective Students in Understand Basic Competency (BC) in Class IV

From the results, the study appears that all demanding BC 4 skills are more difficult than BC 3 who wants to understand the material. kindly complete the difference percentage level difficulty student internal teacher candidates understand basic science material BC in class IV such as **Figure 4.**

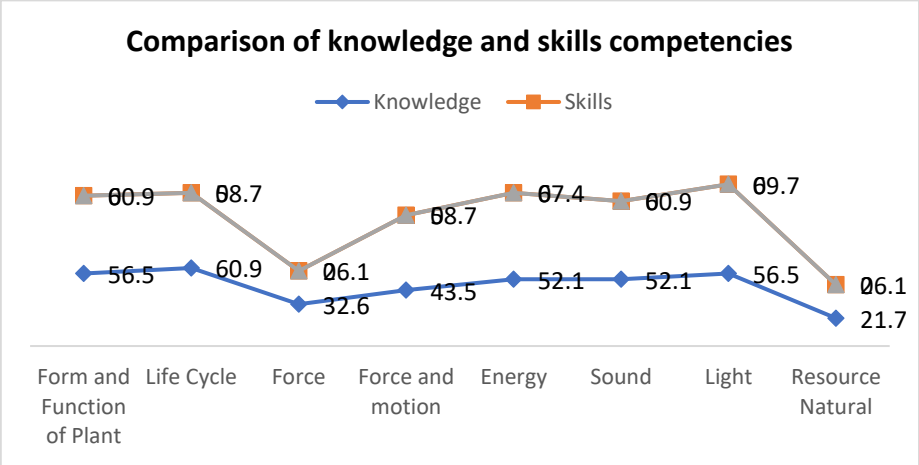

Figure 4. Comparison Percentage difficulties in knowledge and skills Competencies in Class IV

Science material taught in class V is tool movement and function, respiratory system, digestive system, circulatory system blood, displacement heat, heat and change existence, relationship creature life, substance single and mixed, and the environment, and the water cycle. The level of difficulty of BC science according to the view student prospective teachers in class V madrasah ibtidaiyah is listed in **Figure 5.**

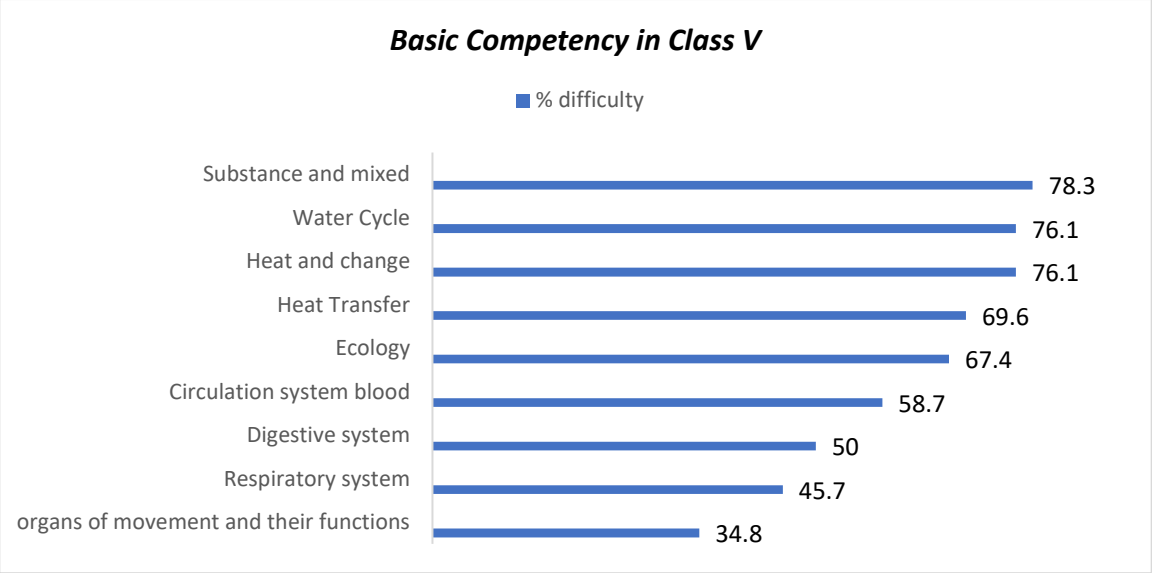

Figure 5. Percentage Difficulty Teacher Prospective Students in Understand Basic Competency in Class V

Competence the basis in class V is the same with class IV, competency skills felt more difficult than competence knowledge. Kindly complete the percentage comparison of BC knowledge and BC skills in class V is seen in **Figure 6.**

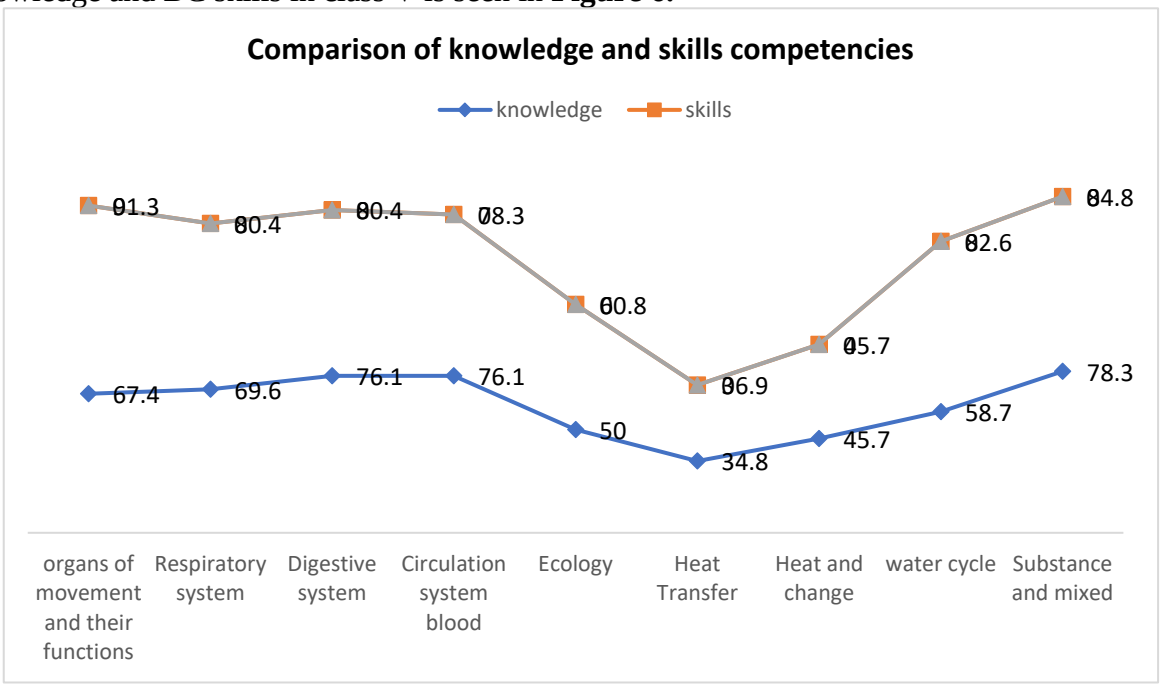

Figure 6. Comparison Percentage difficulties in BC knowledge and skills in Class V

Competence base knowledge in madrasah ibtidaiyah class VI concerns material electricity, magnetism, reproduction, adaptation, rotation, and revolution as well as a solar system. The material of BC knowledge which is considered the most difficult by students is electricity kindly complete the percentage difficulties in BC knowledge shown in **Figure 7.**

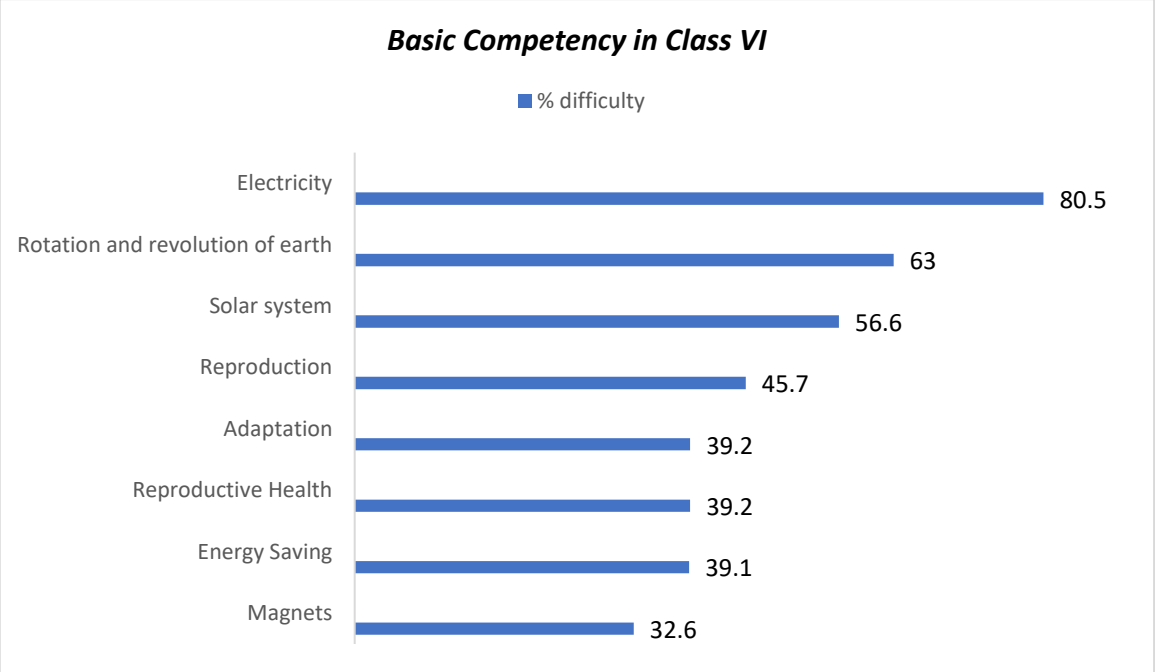

Figure 7. Percentage Difficulty Students Understand Basic Competency in Class VI

According to student teachers, basic competencies that teach skills are more complex than basic competencies that teach knowledge. Basic competencies that require students to be able to carry out investigations, create work, and design products are more complicated than knowledge competencies. Learning that relies on skill competency further activates students through activities inside and outside the classroom. This also relates to a management strategy class (Keddie, 2019). Comparison percentage difficulty fully understanding knowledge competency and skills in class V science material listed in Figure 8.

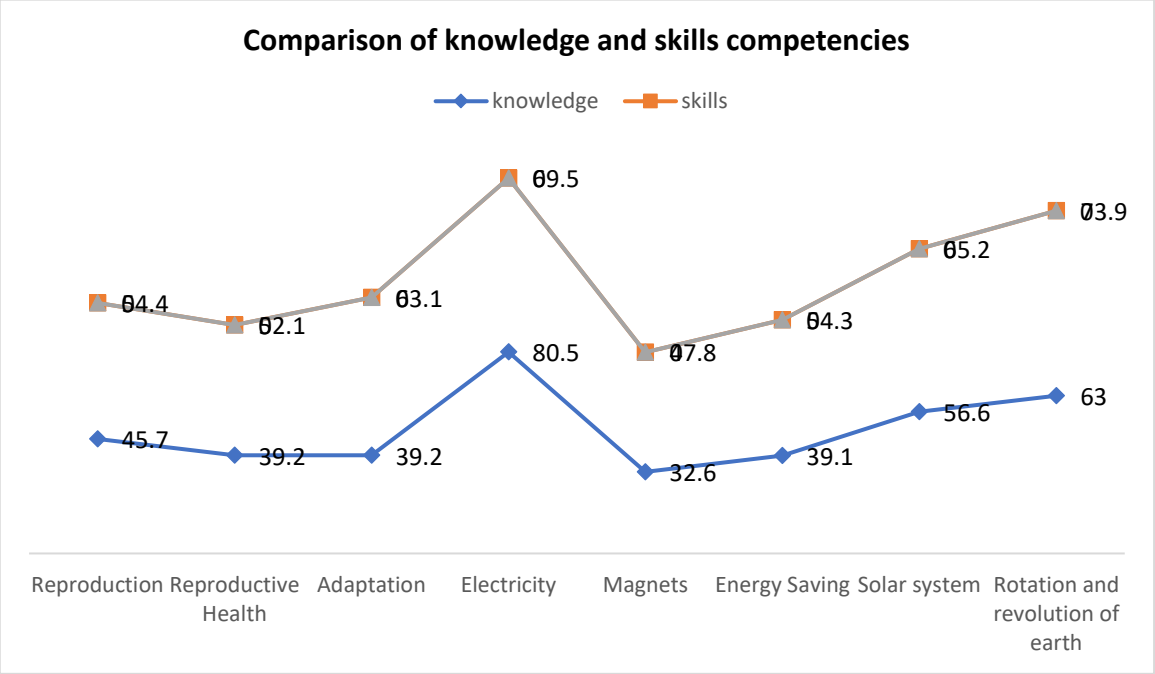

Figure 8. Comparison Percentage difficulties in knowledge and skills competencies in Class VI

Basic competence in Class IV, material form and function plants are loading material many concepts. Students must memorize parts of plants and their functions, so elementary school students still need help memorizing new terms they know. In addition, ibtidaiyah madrasah students still have a concrete mindset. If learning is not supported with practice by showing part plants and animals, students will have difficulty understanding it, and the teacher

will feel difficulty making students understand the material. Otherwise, the object in a manner concrete teacher can use visualizations such as pictures or videos. A lack of visualizations and concrete examples causes a student to experience difficulty in understanding the material (Erinosho, 2013).

Difficulty For serve report results from observation more difficult felt prospective teachers. Most students still need to be capable of drawing parts of plants and animals from their observations, and skills written by scientific students need to be higher. Low teacher abilities support this in scaffolding students to report the results of their observations. Agustina research shows that the ability of internal teacher candidates guides the lowest practice. Suppose compared to other indicators in learning-based practice (Agustina et al., 2016).

Teach cycle life creature life Enough hard. As many as 60.9% of prospective teachers consider material this hard. Difficulty This caused a correlation cycle of life and effort for its preservation. Teach material cycle life must be started with the animals around students to make it easier for teachers to teach the material. Same thing to competence a must skill mastered by students. A teacher doesn't have easy teaching material to make scheme cycle life to students. Teacher's help is needed to teach student school base for make scheme. An example from the teacher is required so that students imitate the teacher to make a scheme. Modeling or teacher example is very important in the science learning process (Wakhidah et al., 2020a). Besides help suitable medium is required so that students can make a good and correct scheme. Audiovisual media is very helpful to students in understanding cycle life animals (Vikiantika et al., 2021).

Prospective teachers stated that teaching the material style Enough easy. As many as 67.4% of prospective teachers agreed that material identification style is easily taught to the student. Competence base This can teach with ease because the student can feel existing forces (muscles, electricity, magnetism, gravity, and force swipe) can felt student when the teacher demonstrates them in front class. As many as 73.9% of prospective teachers stated that demonstrating student styles eassy done and students can imitate with the right. Prospective teachers stated that BC material connecting style and motion Enough easily proved 56.5% of prospective teachers consider that the BC easily taught, though the moment has done BC practicum more difficult for understood student. BC learning must wary of prospective teachers because potentially for raises misconception (Nasution et al., 2021; Resbiantoro & Nugraha, 2017; Taqwa et al., 2020). Difficulty teach style and motion This felt clone teacher when students expected to control or be skilled in serving the results experiment. During become, student prospective teachers also have difficulty understanding style and motion. Taqwa and friends report exists difficulty describe direction normal style, Falling motion freedom, and Newton II law (Taqwa et al., 2020). According to student prospective teachers of madrasah ibtidaiyah competence, the easiest base is natural resource balance. The material it's very easily understood by students. Students more easily for lower competence based on indicators and objectives learning. Students also stated easier for designing activity appraisal. Material This is material nature more concrete. Students can see and observe source Power nature can be updated or not can refurbish. Learning media support on the YouTube platform and other media. Delivery of material resources neither does nature hard. Students do not have enough demand for thinking levels high. The material form draft is simple as it should be memorized by students. Learning with an example non-example strategy can increase results study (Suryani et al., 2018). Learning material This can increase independence in a study with the use of the media because the media contains resource natural Already Enough help student understand material about balance resource nature. The media is also improving the results of study students (Novita et al., 2023; Oktavera, 2015; Zyahrok et al., 2020).

Material cycle life is material class IV is the most difficult according to view student. Material This load cycles the living animal. Various animals studied the cycle of his life.

Material cycle life is more complex than material resource nature. Students demanded think level high. Students must analyzed the difference between complete and incomplete metamorphosis perfect (Ningsih & Rusdiana, 2019; Sulistiyowati et al., 2020). The amount of cycle life a must-animal understood student makes students confused. At the level of school base cycle life, a must animal studied is cockroaches, mosquitoes, grasshoppers, butterflies, frogs, flies, chickens, and cats. The amount a must animal is known to cycle his life makes student class IV madrasah ibtidaiyah feel difficulty for understand the concept. The same thing is also felt by internal teacher candidates designing learning. Student prospective teachers must pack interesting learning so that students are motivated to learn.

Elementary school students are more Like Study concrete matters (Susanti, 2019). Studying cycle life for students living in the village is easier because students have experienced previously about chickens and cats in their house. Experience is knowledge beginning with students before the learning process (Wakhidah & Erman, 2021). Cycle other animals can too be encountered in his environment, though the cycle life of various insects is matter abstract to students because students no see the stages of cycle life in a manner sequentially, however, students in villages that have experience at home There is a cockroach, look grasshoppers in the fields and frogs in the swamps will more easily understand material cycle live. Students living in cities and not having an animal pet will difficult imagine how frog breed. Prospective teachers must capably adapt to the different characteristics of students (Ahmadi, 2017). The difficulty for understand competence is the basis for prospective madrasa teachers is very basic to remember how difficult must material is designed in the learning process. Learning concrete media in accordance context of life students expected can increase their understanding.

Study results indeed are an accumulation of knowledge, skill, and attitude. Competence the basis in the 2013 curriculum shows that for code 3 (eg. 3.1) is BC knowledge and code 4 (eg. 4.1) concerns skill. For examples competence basic science class IV madrasah ibtidaiyah 3.2. Compare the cycle life of any type of creature life as well as a hook with effort preservation, BC skills 4.2. Make scheme cycle life many type creatures living in the environmental surroundings, and the slogan of the effort its preservation. Basic competence cognitive (3.2) demands must ability owned student is comparing cycle life animal before the student capable compare must capable for understand each cycle life animal. On BC skills students must capable of making schemes to cycle life animals and posters for conserving animals. At all materials, student prospective teachers view learning drafts more easily than teaching skills to students. This is proven by the percentage difficulty understanding competence base field knowledge lower than skill. Understanding, designing, and teaching more skills is difficult compared with understanding concepts. Student prospective teachers stated that teaching skills are more difficult than understanding a concept.

From **Figure 6.** It can be seen that the easiest material is material about motion organs and function. Islamic elementary school students who still have pattern thinking concrete will easier to understand tool movements and functions, especially in humans because a student can feel alone tool the motion it has. Material easy understood by students' prospective teachers and ways to teach it. The hardest material according to the student prospective teacher is substance single and mixed. In this world, many very the ingredients in the form substance single and mixed. Students must compare between substance solid, substance liquid, and gaseous substances (Ngai et al., 2014). The student will experience confusion to determine its surrounding objects including substances single or mixed. A student still has difficulty determining is the results identification of the objects around it is substance single or mixed. The water cycle, heat, and changes are also enough material difficult according to view students, include method teach it. Basic competence for the water cycle is very complex and water-related to life. BC of knowledge reads 3.8 Analyze the water cycle and its impact on events on earth as well as the continuity of the creature's life. The material is very complex, although

water can be sensed However impact on life includes thinking level tall for madrasah ibtidaiyah student prospective teachers also feel difficulty in designing learning.

In V class, understanding to draft or knowledge easy if compared to with skill understand material about cycle life with method compare various cycle life animals. If studied with use realm cognitive Revised Bloom's Taxonomy maximum enter C4 (Febrina et al., 2019). However, the bill curriculum in the form of skills for BC makes the scheme about cycle life more difficult If compared to the analysis of cycle life. Make scheme cycle life must understand cycle live any way draw it. This is what students feel prospective teachers so they looked at all skills as more difficult to understand or method teach it. Teaching skills is more difficult than teaching of knowledge. BC 4 (skills) is more difficult than BC 3 (knowledge) with level various difficulties.

Electricity is considered the hardest material because electricity is a very abstract and dangerous material for madrasah ibtidaiyah students and prospective madrasah ibtidaiyah teachers. Although already there is an application that can be worn to teach electricity to madrasah ibtidaiyah students (Masruroh et al., 2020). According to student prospective madrasa teachers, BC skills are more difficult than BC knowledge. In almost every material in class V, BC skills are more difficult compared to BC knowledge except for the material electricity. BC skills for material electricity is stringing electricity in a manner series and parallel. Skills This is the BC bill of skills and is easily planned by the teacher and easily implemented by madrasah ibtidaiyah students. Basic competence related to object sky is also a difficult BC for a prospective teacher. BC concerns concrete objects, however, the distance is very far so that becomes object abstract for a student, as a result prospective teachers also experience difficulty in interpreting this BC.

Attempts made to make it easy to learn knowledge and skills in a manner simultaneous use learning backward (Erman & Wakhidah, 2020, 2023; Murillo-Zamorano et al., 2019). Learning Skills need inner teacher energy prepare sheet work participant to teach, prepare rubric evaluation performance nor rubric evaluation product. Draft learning in plan learning-based practice nor teaching project skills think nor procedural skills are also required thinking deeply to adapt to the material being taught. This proves that student prospective teachers have a view that BC skills (BC 4) are more difficult in planning than his teaching. This happens to all classes that are classes IV, V, and VI.

Prospective teachers must understand the material in BC contained in the curriculum. This understanding is vital because teachers who need help understanding the material well have the potential to give rise to misconceptions. Teachers who understand BC (cognitive and skills) find it easier to design learning for students. Cognitive competencies must be well understood by teachers so that teachers can present lesson material. BC skills allow teachers to create student creativity through work or presenting information (products, practical reports, posters) or oral presentations. Prospective teachers who need help understanding BC skills cause teachers to fail to design practicums or creative learning that produces student work. Identifying difficulties in understanding BC among prospective teachers provides information to students and administrators of madrasah basic education study programs to conduct curriculum studies and lecture designs that equip prospective teachers to be competent in implementing a curriculum including BC.

CONCLUSION

Perception student prospective teachers of madrasah ibtidaiyah about competence basic (BC) skills more difficult to understand and taught compared to BC knowledge. This happens to all material in grades IV, V, and VI. Competence base hardest knowledge for understood and taught to students in class IV is material about cycle live. In class V material or the most difficult BC of knowledge is substance single and mixed, while the most difficult material for

understood and taught by student's teacher candidate in class VI is electricity. The results of the research become a basis for further research in choosing basic competencies that are difficult to study by providing appropriate strategies or media so that they become easier to teach. The limitation of this research is that the perceptions given by prospective teacher students need to provide a complete picture of their ability to understand the basic competencies in the curriculum. However, this research provides information about basic competencies that are difficult in the 2013 curriculum in Indonesia so that it can be used as a reference. In further research, especially in selecting the material that will be used as research material. Difficult BC contains complex material, so it is necessary to research and improve students' ability to understand the material by using various learning models and suitable learning media. Further research on the difficulties of prospective teachers in understanding BC needs to be carried out by analyzing the learning implementation designs designed by prospective teachers so that it completes the information from this research that BC is indeed rugged to understand and reduced to learning objectives.

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