INSECTA **Vol. 7 No. 1, 2026, pp. 34 - 44**

Available online at
INSECTA
Integrative Science Education and Teaching Activity Journal
Newspaper homepage: https://jurnal.iainponorogo.ac.id/index.php/insecta

Article

Analysis of Epistemic Beliefs of Prospective Science Teachers in Carrying Out Practicum Activities Reviewed From Motivation

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Article Info
Article history:
Received: March 19, 2026
Accepted: April 25, 2026
Published: May 31, 2026

Keywords:

Epistemic Beliefs;
Motivation;
Practicum

ABSTRACT

Science education, especially in the field of Natural Sciences (IPA) plays an important role in shaping students' skills and understanding, especially through practicum activities as a means of applying theory in a real context. This study aims to analyze the influence of epistemic beliefs of prospective science teachers in practicum activities, identify the role of motivation on epistemic beliefs, and find out the relationship between the two. Based on the purpose of the study, this study was designed using a descriptive qualitative method with observation, interview, and questionnaire techniques on 30 prospective science teachers in the Tadris Science laboratory at IAIN Ponorogo. The use of questionnaires in this qualitative research serves as supporting data to strengthen the findings, with the main analysis still emphasizing qualitative descriptiveness. Then the data from the research results are compared with the existing research theory which will later provide research conclusions. The results of the study show that the majority of prospective science teachers have high epistemic beliefs, with a percentage of 80% in the high category. This belief includes four dimensions, namely, certainty of knowledge, simplicity, source of knowledge, and justification. In addition, 52% of respondents have the motivation to develop their potential through practicum activities. There is a positive relationship between epistemic beliefs and motivation, where strong beliefs can increase motivation to actively engage in practicums. This study concludes that the development of epistemic beliefs and good motivation is very important to improve the quality of science education in Indonesia.

INTRODUCTION

The era of globalization is growing in the 21st century, but Indonesia is still faced with various complex challenges, where the economy and access to education are uneven. Based on the results of a survey conducted by *International Programme for Student Assessment (PISA)* 2022, shows that Indonesian students are ranked 64th out of 81 countries and will be pursued by the Ministry of Education and Culture regarding curriculum changes so that science learning can realize an increase in understanding of epistemic beliefs and a spirit of literacy that is increased (Vasalampi, K.2023).

This epistemic belief is the main foundation for individual development in improving science because epistemic belief refers to a person's understanding of how a science is obtained and applied to life. However, education in Indonesia has not applied epistemic beliefs perfectly, so the quality of Human Resources (HR) and the quality of education in Indonesia are very low. Epistemic beliefs will change the way individuals perceive the world, gather information, and form opinions. In the context of education, understanding epistemic beliefs will be the same as understanding the basic principles of science because it affects the quality of learning and the development of each individual's critical thinking skills. Individuals who have understood how knowledge is obtained will allow the individual to think independently, reflectively, and be able to consider the information obtained critically (Noroozi, 2023). An individual's understanding of epistemic beliefs is an integral aspect in the world of education in order to create individuals who are adaptive, and able to solve complex problems that they are facing.

Teachers are an important profession in increasing the intellectual generation in a country, which must be able to provide knowledge, skills, and attitudes to convey knowledge to students. Professional teachers must have many abilities and know their beliefs, to be able to manage learning well, especially for science teachers (Wakhidah & Anugra, 2023). A prospective science teacher needs to know the epistemic beliefs he has, this is because through this belief prospective science teachers will be able to organize learning well that can encourage students to describe a broader perspective (Lunn et al., 2017). This will form the learning that is carried out will be able to connect with various things and provide a more meaningful understanding in learning. In learning activities, epistemic beliefs, teachers have an active role as a benchmark for students (Mumbai, 2023). The teacher's epistemic beliefs will influence the students' epistemic beliefs, so basically the teacher's epistemic beliefs contribute to the student's perception and provide a foundation for teaching and representing knowledge. Which means that students' epistemics are influenced by the surrounding environment and will affect their learning process (Lunn et al., 2017).

Hofer and Pintrich (1997) stated that epistemic beliefs consist of four dimensions, namely, certainty, simplicity, source, and justification. justified through strong evidence and arguments. The first dimension of certainty, this dimension is described in theory *Natural of Scince* (*ABOUT*) which explains that scientific knowledge is something that cannot be changed and is certain, but the modern understanding explains that scientific knowledge can develop or change with time and the development of the times or technology. The second and third dimensions of development and sourcing. This can be done by analyzing and observing individual efforts to interact through sources of knowledge, justification, certainty, and development, and justification. The fourth dimension is justification, where this dimension includes how individuals analyze the truth of science through the presentation of evidence, evaluation from experts who then obtain scientific results that are certain to be true and can be scientifically proven (Karimatus Saidah, 2023).

Research conducted by Hsin-Ning Jessie Ho & Jhy-Chong Liang (2015) on the relationship between epistemic beliefs, learning concepts and motivation to learn science in high school students in Taiwan, suggests that students who view scientific science as something uncertain tend to have motives raised in studying science (Ho & Liang, 2015) . These findings also state that the application of standardized tests reduces students' curiosity and interest in learning science. Research conducted by Sitti Rahma (2021) regarding the analysis of the relationship between science process skills, motivation, and science learning outcomes (Yunus et al., 2021). It shows that the correlation between motivation and learning outcomes affects each other but in low results, and there are other factors that affect learning outcomes. According to Andreani B.'s (2020) research, his work states that epistemic beliefs contain various arguments built by students. Based on the results of his research, it is shown that epistemic beliefs are able to describe the relationship between epistemic beliefs and ways of learning or understanding the science of knowledge. In this study, they tried to reveal about

epistemic beliefs and the concept of science learning is related to each other (Baytelman, et. al., 2020)

After looking at the perspective of experts and previous research, revealing the fact that there is an attachment between epistemic beliefs, motivation, and learning of Natural Sciences (IPA), both of which have an attachment in developing students' understanding of scientific learning concepts and processes. Natural Sciences (IPA) plays an important role in shaping students' character, skills, and understanding in facing challenges in the modern era. One of them is practicum activities, where practicum activities play a role as the main component in science education which has the purpose of being a means to apply the theories that have been learned in a real context (Nisa, 2017). Through practicum prospective teachers can be exposed to the basics of the scientific process through investigation-based activities and help foster scientific attitudes, this affects personal behavior in the practicum they do (Chheun & Kong, 2023). Practicum activities help students in understanding science concepts, developing critical and analytical thinking skills. However, the success of this practicum activity is influenced by epistemic beliefs.

Epistemic beliefs can help prospective science teachers in preparing learning activities, this makes epistemic beliefs important for prospective science teachers to know. The epistemics will support practicum activities that play an important role in honing the science skills of prospective science teachers. Practicum activities are able to improve in-depth content knowledge, special experimental skills such as critical thinking, and report writing skills (Yani et al., 2021). Practicum skills are one of the skills that must be possessed by prospective science teachers. Science learning so far tends to only study the essence without reflecting on the essence of the activity (Hoffa & Freeman, 2007). A good understanding of epistemics for prospective science teachers is the main capital in teaching practicum activities. Good practicum activities are also recognized as able to encourage the involvement of prospective science teachers and can develop various skills, knowledge and conceptual understanding. In addition, practicum activities can train prospective science teachers in their ability to prepare and carry out practicums. On the other hand, practicum activities will be carried out if prospective science teachers have a high level of motivation in learning. High motivation is able to provide encouragement to prospective science teachers to continue to develop science skills, including practicum activities.

Motivation is an important foundation to increase interest in teaching and learning (Fahrudin & Ulfah, 2023). Motivation is one of the factors that affect the success of students, in this case a person will get the desired learning results if there is a desire in him (Rahman, 2022). Motivation is related to the learning outcomes of a prospective science teacher, such as goals, what is desired and how to achieve these goals, especially in the context of practicum. Motivation is an absolute requirement in learning, if in the context of learning motivation is low, it will affect the results of the practicum. Motivation is divided into intrinsic and extrinsic motivation, each of which has a different impact on prospective science teachers in carrying out practicum activities. Intrinsic motivation that comes from within the prospective science teacher such as encouragement by desire, self-satisfaction, meeting needs and others. Meanwhile, extrinsic motivation comes from outside the self such as academic demands, family demands, and other sources. Prospective science teachers who have intrinsic motivation tend to enjoy the activities carried out in contrast to prospective science teachers who have extrinsic motivation. Therefore, it is important to understand how motivation interacts with the epistemic beliefs of prospective science teachers in carrying out practicum activities.

Based on the results of the pre-research and previous research studies, it is able to illustrate that there is a relationship between motivation and epistemic beliefs for practicum activities. Although there is a general understanding of epistemic beliefs and motivation, there is still a lack of research that specifically addresses the relationship between these two factors and practicum activities for prospective science teachers. The difference between this study

and the previous research is that in the previous study it emphasized more on students as the main subject, but in this study it was more about the subject, namely prospective science teachers who carried out practicum activities. In the process of discussing this research, it offers novelty by using more descriptive discussions. This study was made with the aim of analyzing the epistemic beliefs of prospective science teachers in carrying out practicum activities, and how motivation affects these beliefs. By understanding the relationship between the two, it is hoped that effective strategies can be found to improve the quality of Indonesian education, especially in the field of science through the development of epistemic beliefs and motivation of prospective science teachers.

METHODS

This study uses a qualitative research method with a descriptive approach, which aims to describe a phenomenon that occurs in the field without having to change and reduce or add to its variables (Scott, 2016). The subjects of this study are 30 prospective science teachers in the second semester of biology specialization who are carrying out practicum activities in the Tadris Science laboratory. Data collection techniques used observation, documentation interviews, and questionnaires. The use of questionnaires in this qualitative research serves as supporting data to strengthen the findings, with the main analysis still emphasizing qualitative descriptiveness. It is important to ensure the validity of the data obtained so that it is credible and valid, so the researcher uses the data triangulation method, this technique is used in research by utilizing various different data sources, methods, theories or research with the aim of obtaining a more comprehensive picture and reducing the bias that may arise if only one source or method is used (Nurfajriani, Wiyanda Vera, 2024).

Data analysis procedures and techniques utilize the Miles, Huberman, & Saldana model, with four stages, namely data collection, data reduction, data presentation and conclusion drawn. The research conducted includes several types of questions related to epistemic beliefs and motivation of prospective science teachers. The questionnaire survey, in the survey process, provides questions to prospective science teachers in the form of a questionnaire adapted from the five motivation hierarchies in Abraham H. Maslow's research to examine the motivation of prospective science teachers in carrying out practicum activities, then the questionnaire survey also provides questions to prospective science teachers about the four dimensions of epistemic beliefs in the research of Hoffer and Pintrinch (1997) to see how epistemic beliefs the prospective science teacher has. The questionnaire used in this qualitative research has been tested for validity and reliability through the assessment of several experts, so it is suitable for use as a data collection instrument in accordance with research procedures. The interview activity began with a question about self-identity, then the motivation of prospective science teachers in carrying out practicum activities. Then continued by asking questions about beliefs epistemic science teacher candidates. In the questionnaire survey data analysis process, an interval is needed to determine the categories in the data analysis results which can be seen in table 1.

Table 1. Epistemic Belief Intervals

No.	Interval	Categories
1	51-100%	Height
2	0-50%	Low

Based on the process, this research was carried out by exploring various information about epistemic beliefs and motivation of prospective science teachers in carrying out practicum activities. In order to reveal in depth the epistemic beliefs of prospective science teachers from the data that has been analyzed, the researcher will reveal three main points that will be discussed, namely, the first point is to determine the epistemic beliefs of prospective science teachers, the second point is to identify how motivation affects the epistemic beliefs of prospective science teachers, the third point is to find out how the relationship between

epistemic beliefs and the motivation of prospective science teachers in carrying out activities practicum.

RESULTS AND DISCUSSION

Based on the analysis of the data that has been carried out, an explanation was obtained regarding the epistemic beliefs of prospective science teachers reviewed from the motivation as described below:

Analysis of Epistemic Beliefs of Science Teacher Candidates

The researcher's process of information begins with curiosity to explore a problem. This epistemic belief was measured using a questionnaire adapted from the four dimensions of Hoffer & Pintrich's epistemic beliefs which were then disseminated to 30 prospective science teachers who were conducting practicum activities, where each dimension of epistemic beliefs had 4 questions. The percentage results of the questionnaire are then entered into the initial table which will later show an overview of each dimension of epistemic beliefs as stated in the table below.

Table 2. Total Responses of Questionnaire Respondents Related to the Epistemic Beliefs of Science Teacher Candidates Based on Four Dimensions

Dimensions	Categories	Yes/Appropriate	No/Not Suitable
1	Certainty of Knowledge	61,67%	38,33%
2	Simplicity of Knowledge	61,67%	38,33%
3	Knowledge Resources	58,33%	41,67%
4	Justification	66,67%	33,33%

Based on the results of the research data in Table 2, it can be explained regarding the total respondents that in the first dimension, namely certainty of knowledge. In this dimension, an average of 61.67% of prospective science teacher respondents stated that knowledge has certainty. This shows that the majority of prospective science teachers believe that knowledge can be considered something definite and reliable. Meanwhile, 38.33% of respondents stated that the statement was not in accordance which shows that there is doubt about the certainty of knowledge, which may be caused by their experience, so that it can be categorized that the certainty of knowledge is in the high category with a corresponding statement of 61.67%. In the second dimension, namely the development or simplicity of knowledge, an average of 61.67% of prospective science teachers chose the appropriate statement that knowledge can be simplified and believed that knowledge could be understood in a simple way. And another 38.33% answered the statement that it was not appropriate, they believed that some science concepts were too complex to understand, with this the dimension of knowledge development was categorized in the high category with a corresponding statement of 61.67%. In the third dimension, namely the source of knowledge obtained, an average of 58.33% of the statements of prospective science teachers stated that the knowledge they obtained was not doubted about the validity, they believed that knowledge derived from personal experience or experiments could contribute to science if verified by scientific research and supported by experts and the other 41.67% chose statements that were not suitable, this shows that there is still a majority of prospective science teachers doubting the validity of the sources of knowledge they receive both from books, the internet, and other sources. Doubts about this source of knowledge may indicate the need for further training in evaluating sources of information and developing skills in selecting the right sources in learning. In this case, the third dimension of epistemic beliefs is categorized in the high category with a percentage of 58.33%. In the fourth dimension, namely justification, an average of 66.67% of prospective science teachers stated that it was appropriate, which means that prospective science teachers understood the importance of arguments and evidence in supporting scientific claims, especially in practicum activities. And 33.33% of prospective science teachers chose inappropriate answers, showing that there are still challenges in understanding how knowledge can be scientifically justified. In this case, it

is necessary to emphasize the strengthening in teaching about the scientific method and the importance of justification in the learning process, in this fourth dimension it is categorized into the high category.

Based on the results of interviews and observations that have been carried out, it is found that some prospective science teachers still do not understand what epistemic beliefs are. But unknowingly in Table 4.2 stated that the analysis of survey data regarding epistemic beliefs is in the high category, namely in justification with the highest average percentage of 66.67%, the dimension of knowledge development 61.67%, certainty of knowledge 61.67%, and the source of knowledge in the low position of 58.33%, the dimension of knowledge sources is in the last position because some prospective science teachers still consider that the source of knowledge is only from books or experts, which in fact knowledge can be obtained from various aspects. In addition, there are also many digital media as one of the sources of information, but the spirit of exploration and scientific listeration plays an important role in increasing epistemic beliefs (Hasnawati et al., 2023).

Epistemic beliefs are beliefs that each individual has about how knowledge is acquired, organized, stored and applied in daily life. Epistemic beliefs have an indirect effect on academic performance, as these beliefs can only influence academic strategies to obtain the learning goals that have been set by each student (Guilfoyle, et al., 2020) . This belief is quite difficult to detect even many individuals who are not aware of the beliefs that exist in themselves, but researchers use four dimensions according to Hofer and Pintrich (1997) as indicators in obtaining research data to determine the epistemic beliefs of prospective teachers. The dimension of epistemic beliefs has an important role in shaping the way individuals, especially prospective science teachers, understand and interact with the students, understanding how these dimensions can help them in the learning process, especially practicum. Epistemic beliefs can be influenced by a variety of factors. The character of the learning environment is also one of the factors regarding the epistemic beliefs they believe. The epistemic belief in Bernhholt, list states that students describe knowledge, truth, information and define knowledge as synonyms. Then similarities and differences regarding educational background are considered in instructional implications, which means that different cultural backgrounds can affect the epistemic beliefs that a person has (Bernholt et al., 2021).

Based on the findings of the data obtained, it shows more attention in the education of prospective science teachers in developing stronger epistemic beliefs, especially in terms of evaluating sources of information or knowledge. Thus, later you will get prospective science teachers who are better prepared to face challenges in teaching and learning. It should be remembered that this research was conducted on prospective science teachers in the 2nd semester which is most likely related to the epistemic beliefs they have changed over time, increasing experience, and the development of the times. The results of the study show that prospective science teachers today refer more to their lack of discipline in learning, even though they believe that effort and effort in learning are more important than innate ability. This also shows that innate abilities from birth will be beneficial for individuals but if not honed they will be eroded by the development of increasingly advanced science, so that prospective science teachers who are disciplined and have good science literacy will be superior (Sayekti, et al., 2024)

Motivation of Prospective Science Teachers in Carrying Out Practical Activities

Based on the analysis of epistemic belief data, it is known that each prospective teacher has a different level of belief. There are several factors that can affect the level of epistemic belief, one of which is motivation. Motivation is the drive that encourages individuals to perform an action with a clear goal. Motivation is the encouragement in each individual to do something with a clear goal. Motivation has an important role in teaching and learning activities. The motivation of prospective science teachers is closely related to the learning outcomes obtained. Motivation will affect how prospective science teachers carry out practicum activities,

besides that motivation is also influenced by goals. If the goal to be achieved is high, the motivation will also be greater, this will later strengthen activities in practicum activities.

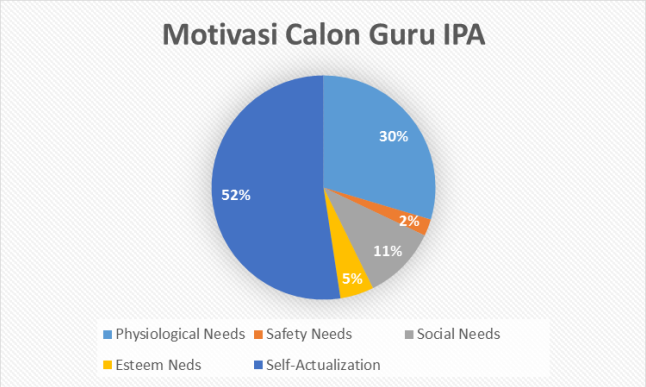

Figure1. Science Teacher Candidate's Motivation

Based on the interval data that has been obtained above, it can be seen that *Self-Actualization* is at a high percentage, which is 52%, which means that the average prospective science teacher participates in practicum activities because they are motivated to develop the potential that exists in them. Prospective science teachers who have the desire to reach their potential and develop their potential teaching skills will be more motivated to be involved in practicums. In addition, those who strive to be good science teachers will be more open to new ideas and the development of deeper epistemic beliefs. In addition, this need will provide a positive stimulus to belief in science. Then in the second position, namely *Physiological Needs* (physiological) with an average of 30%, prospective science teachers are partly motivated to do practicum because it is based on interest in the facilities and infrastructure available In the context of practicum Prospective science teachers who have physiological needs met, they will tend to be more focused and involved in the learning process, on the other hand, if these needs have not been met they tend to be more easily distracted from activities practicum. This has an impact on their lack of confidence in the knowledge gained. Therefore, it is important for educational institutions to create a laboratory environment that supports the physiological support of prospective science teachers. *Social Needs* (social) with an average of 11%, the average science teacher candidate is motivated to take part in practicum because of the existence of social relationships both from lecturers and group friends. This need is also able to strengthen their soul and belief so that it will make prospective science teachers more confident. In addition, the observations that have been made also show that prospective science teachers are active in carrying out interaction activities either with friends or lecturers.

Esteem Neds (award) with an average of 5%, which means that the average prospective science teacher who chooses this hierarchy they take the practicum because they just want to get recognition either from lecturers or friends. Prospective science teachers who get *positive feedback* and recognition for their efforts during the practicum are more likely to increase their confidence. This award can be in the form of praise, grades, recognition from friends or lecturers, which stimulates their confidence in the knowledge obtained. Fulfilling this need is also important in developing strong epistemic beliefs. *Safety Needs* (safety) with the lowest acquisition of 2%, prospective science teachers who choose this hierarchy tend to assume that they are participating in practicum activities because they want to meet the demands of academics and get good grades. This need also includes a sense of physical and psychological security, prospective teachers who meet this need tend to feel psychologically burdened by the demands of academics or courses. They will tend to be indifferent in understanding the concepts behind the practicum and will later have an impact on their belief in knowledge. However, if this need is based on the academic stability of the lecturer or institution, it allows them to strengthen their epistemic beliefs

Motivation has a very important function in a learning activity. Motivation will affect practicum activities, but motivation is also influenced by goals. If the goal to be achieved is higher, the motivation is also stronger so that it will have an impact on the process of practicum activities carried out. This is in line with Susanto's statement that learning motivation is something that encourages students to be able to do learning activities (Fajarianingtyas & Hidayat, 2021). The higher the motivation in learning, the achievement in learning will also increase. The success of prospective teachers in their education is also influenced by the motivation for achievement. Achievement motivation is the driving force that allows a person to successfully achieve what he or she wants. A person who has high achievement motivation tends to always try to achieve what he or she wants despite obstacles and difficulties in achieving it. Learning success cannot be separated from the motivation of the person concerned, therefore motivation is a factor that greatly affects a person's learning success (Sumantri & Wibowo, 2023).

The Relationship Between Epistemic Beliefs and the Motivation of Prospective Science Teachers in Conducting Practicum Activities

The ability of prospective science teachers is influenced by various internal factors, one of which is motivation and epistemic beliefs. Epistemic beliefs refer to individual beliefs about the nature, origin, and validity of knowledge. Epistemic beliefs include four dimensions, namely, certainty of knowledge, simplicity, source of knowledge, and justification. This belief influences the way prospective science teachers understand and implement the knowledge gained, as well as understand how they interact with new knowledge. Prospective science teachers who have strong epistemic beliefs tend to be more open to learning and exploration of scientific ideas or concepts. Meanwhile, motivation is an impulse that encourages individuals to do something with a clear goal. Motivation can come from internal or external sources which can play a role in encouraging prospective science teachers to conduct practicum and develop better epistemic beliefs.

Based on the results of research that has been conducted on prospective science teachers, it is found that there is a relationship between epistemic beliefs and motivation, the relationship between these two indicators has a positive influence on prospective science teachers when conducting practicums. Prospective science teachers also believe that if they have high epistemic beliefs, they will also be more motivated to do practicums, and vice versa if their motivation is high, it will affect their epistemic beliefs when doing practicums. In addition, prospective science teachers who have high epistemic beliefs turn out to be motivated in a category or level of self-actualization. This self-actualization is the hierarchy of the fulfillment of the highest needs according to Abraham H. Maslow, this need for self-actualization is a need at the peak level where this need will be fulfilled when the needs below it are fulfilled(Muhfizar et al., 2020). In this need, prospective teachers will develop their potential, the need to improve their abilities, the need to improve themselves often and improve their abilities. In addition, it was also found that prospective teachers who have low epistemic beliefs have motivation in the physiological category, prospective teachers who are at this level of motivation affect their way of doing practicum activities. In addition, prospective science teachers who are at this level are more focused on fulfilling basic needs such as comfort, safety and fulfilling other physical needs. Later it will affect their effectiveness in practicum activities

Understanding the relationship between epistemic beliefs and motivation is essential, as this will create an effective learning environment and support the professional development of prospective science teachers. The relationship between epistemic beliefs and motivation can be seen from several aspects:

1. The influence of epistemic beliefs on motivation

   Prospective science teachers who have strong epistemic beliefs tend to be open to learning and exploration of knowledge. They are also more motivated to seek out new information and understand complex concepts. In addition, positive epistemic beliefs

can increase the confidence of prospective science teachers in facing academic challenges. When prospective science teachers feel confident in their ability to understand and implement, their motivation to learn and understand in practicum activities will increase.

2. The influence of motivation on epistemic beliefs

   High motivation, both intrinsic and extrinsic, can encourage prospective science teachers to be more active in seeking knowledge, they will be more deeply involved in learning activities which will later provide a positive impact on the development of epistemic beliefs along with the experience and knowledge gained. The motivation to continue learning and growing can encourage aspiring science teachers to reflect on their experiences. This process of reflection is important in building epistemic beliefs, and helps them relate the practicum experience to the theory they have learned.

The relationship between epistemic beliefs and motivation has a complex relationship, a positive belief in certainty, simplicity and justification of knowledge can increase their motivation to engage in practicum activities. However, doubts about the source of knowledge and low motivation in the aspects of security, social, and reward are feared to hinder the development of their epistemic beliefs. It is important for an educational institution to create an environment that is able to support prospective science teachers to feel safe, appreciated and motivated to achieve self-actualization so that they will later be able to develop stronger and more effective epistemic beliefs.

Prospective science teachers with high epitopic beliefs understand that knowledge is dynamic and not fixed. They also recognize that knowledge can evolve through further research and new discoveries. This encourages them to always seek information from various up-to-date and relevant sources. This will have an impact when they do a practicum where they will emphasize justification and evidence in each activity. In addition, prospective science teachers with high epistemic beliefs are also able to believe that knowledge is the result of a process that involves experimentation, research, observation and analysis. And knowledge can change over time and the development of the times. Prospective science teachers with high epistemic beliefs and motivation at the level of self-actualization consider that the potential that exists in them is an encouragement to continue learning and developing. They have a strong desire to be actively involved in practicum activities. Prospective science teachers who have motivation to actualize themselves tend to innovate in practicum activities, they will make more effort to design activities as best as possible.

Meanwhile, prospective science teachers who have low epistemic beliefs and are motivated at the physiological level, they face more complex challenges in the learning process. Low epistemic belief refers to the view that knowledge is absolute, in this view it also provides the thought of doubts about the accuracy and certainty obtained. Low epistemic confidence makes it difficult for prospective science teachers to understand how important justification is in knowledge. Motivation at the physiological level is closely related to the basic needs necessary for survival. In the context of prospective science teachers, this physiological motivation can influence their perspective in conducting practicum activities. If these basic physiological needs are not met properly, it will have an impact on the focus and performance of the practicum, this is in line with the theory put forward by Maslow that the most basic needs that must be met by everyone are physiological needs, if these needs have been met, they can meet the needs at the next level (Trived & Metha, 2019).

Overall, these four dimensions show a close relationship with their physiological motivation. Uncertainty of knowledge and inaccurate sources of information can cause tension or nervousness, while simplicity and positive justification will help meet basic physiological needs so that prospective science teachers remain motivated to undergo practicum optimally. Therefore, the provision of reliable learning resources, intensive guidance from lecturers, and

a conducive and good practicum environment are essential to support the physiological motivation and learning success of prospective science teachers

CONCLUSION

This study shows that epistemic beliefs and motivation have a positive relationship. Prospective teachers with high epistemic beliefs tend to be more capable in understanding, processing, and believing in scientific knowledge, which is supported by a level of motivation at the level of self-actualization to develop their potential. Highly motivated teacher candidates tend to have the view that knowledge is developed, complex, and obtained through scientific processes, thus making them more active, critical, and reflective in practicum activities. In contrast, prospective teachers with low epistemic acumen and motivational levels at the physiological level tend to view knowledge as something definite and static, as well as lack of active involvement in practicum and focus more on meeting basic needs. Thus, positive epistemic beliefs can increase motivation in practicums, while low motivation can reinforce doubts about scientific knowledge.

This research implies that strengthening epistemic beliefs and motivation needs to be integrated in practicum learning through inquiry-based strategies, reflection, and the provision of a supportive learning environment to improve the quality of prospective science teachers. However, this study has limitations in the number and scope of subjects that are limited to one institution, a qualitative descriptive approach that is interpretive, and the character of respondents who are still in the early semester so that it allows changes over time. Therefore, further research is recommended to involve a wider and more diverse sample, using a mixed-method approach or similar, and examining learning interventions with other variables in order to obtain a more comprehensive understanding later

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