

LEARNING OUTCOMES IN CALCULATING THE QIBLA DIRECTION USING SPHERICAL TRIANGLES IN LAW CLASS

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Abstract

This article aims to analyse the learning outcomes in calculating the qibla direction using the cosine and sine formulas of spherical triangles in the Constitutional Law class of the Faculty of Sharia and Law at UIN Sunan Ampel Surabaya during the odd semester of the 2024/2025 academic year. This research employs a mixed-method approach, combining descriptive quantitative and qualitative methods through a case study conducted in the Law class. Data collection was conducted using a questionnaire with a dichotomous scale. The collected data includes information before and after the lecture on calculating the qibla direction, which utilises the cosine and sine formulas of spherical triangles. Furthermore, changes in data before and after the lecture are analysed based on the level of change in the responses to the questionnaires completed by students. Based on the results of the analysis conducted, it was found that many students lacked comprehensive knowledge about the direction of the qibla before the lectures, both from a fiqh and a mathematical perspective. Following the lectures, a significant change occurred in the understanding of this qibla direction, which, mathematically, increased by 65.77%. Meanwhile, in terms of calculation skills for determining the qibla direction, before the lectures were held, only a small fraction of the students stated they could calculate the qibla direction for both areas in Indonesia and outside Indonesia. After the lectures, there was a significant change of 74.32% expressing their ability to calculate the qibla direction for areas in Indonesia, as well as outside Indonesia.

Keywords

Law Class, Learning Outcomes Evaluation, the Direction of the Qibla.



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INTRODUCTION

The existence of courses closely related to calculations in law classes is a unique aspect, as most students who take or choose social sciences tend to avoid courses related to calculations (Suminta & Sayekti, 2018). This causes courses that are closely related to calculations in law students to present anxiety often. Even though anxiety does not affect learning outcomes (Ghouchani et al., 2019), the anxiety experienced by the students resulted in a defeatist attitude among them. This negative attitude arose from the belief and conviction that courses related to calculations are complicated and complex (Ulpah, 2009). Research has stated that law students who achieve good grades in advanced mathematics courses will experience faster and more successful outcomes at university (Kleemola & Hyytinen, 2019). This is because in mathematics, students have critical, creative, and literal thinking skills (Setiawan, 2017).

The uniqueness mentioned above is present in the Faculty of Sharia and Law at UIN Sunan Ampel Surabaya, specifically in the Law and Constitutional Law study program classroom in the odd semester of 2024/2025. The course that is closely related to calculations is the Islamic Astronomy course. In its study, Islamic Astronomy concerns issues such as determining the direction of the qibla, prayer times, the beginning of the month, and eclipses (Hambali, 2013). Meanwhile, the calculations related to the studies in Islamic Astronomy cannot be separated from mathematics, which is the science of measuring spheres that forms the basis of the (Hw, 2018). Therefore, a relationship can be established that law students who take the Islamic Astronomy course, a mandatory course in the Faculty of Sharia and Law at UIN Sunan Ampel Surabaya, are taking the course on spherical geometry in the study of mathematics.

The presence of the Islamic Astronomy course at the Faculty of Sharia and Law at UIN Sunan Ampel Surabaya often causes anxiety among students. This anxiety is evident every semester, with students repeating this subject. Three students from the Law study program are repeating the Falak Science course in the odd semester of 2024/2025. Four students repeat the Islamic Astronomy course while in the Constitutional Law study program. However, it is important to note that Islamic Astronomy is not only related to measuring spheres or mathematics. Instead, the topics discussed in this Islamic Astronomy course cannot be separated from the fields of fiqh, mathematics, and astronomy (Solikin, 2020). Fiqh in the study of Islamic Astronomy provides a position related to legal decisions based on Islamic teachings. Mathematics provides a position related to the calculation process. Meanwhile, astronomy provides a position related to data computation. The

implication is that students in the Law study program at the Faculty of Sharia and Law at UIN Sunan Ampel Surabaya, in their fifth semester, when taking the Islamic Astronomy course, will indirectly study these three fields: fiqh, mathematics, and astronomy. Similarly, students in the state Law Study Program who enroll in the Islamic Astronomy course in their third semester will have the same experience.

The presence of Islamic Astronomy in the Faculty of Sharia and Law at UIN Sunan Ampel Surabaya is one of the considerations as a distinguishing feature of the curriculum at the faculty level. This consideration is based on the belief that Islamic Astronomy is a real implementation of integrating knowledge between science and religion in higher education (Qulub, 2018). Although integrating science and religion is not limited to Islamic Astronomical issues, it also encompasses inheritance calculations (Diponegoro et al., 2024). However, applying this integration of science and religion has shortcomings, particularly in its implementation strategies (Qulub, 2018). These shortcomings arise because it is not uncommon for educators to feel confused about how to start teaching the relationship between Islamic values and mathematics learning in the classroom, and when this application should be (Inganah et al., 2023).

In line with this, many efforts have been made in mathematics to eliminate the belief that mathematics is complicated. Among the efforts made are teaching mathematics through poetry (Mumtazah & Asih, 2024), using numeric literacy (Zafrullah et al., 2024), and utilizing song lyrics (W. Damayanti, 2022). The same thing also happens in the Islamic Astronomy course related to qibla direction calculations. Among these efforts is using open-ended questions in the lectures (Solikin et al., 2023) and fostering enthusiasm for astronomy studies using GeoGebra (Azmi & Ukhti, 2023). It is different in mathematics, as there are already many studies discussing the evaluation of learning outcomes, while in the study related to the evaluation of learning outcomes in Islamic Astronomy, based on the author's research, there is only one, which is a study discussing the impact of the course on the calculation of direction to the qibla and prayer times in the religious life of students (Solikin, 2019).

In line with this, there has been considerable research in mathematics aimed at dispelling the notion that mathematics is complicated. Among the studies conducted is the research (Mumtazah & Asih, 2024), which teaches mathematics through poetry, and there is also research (Zafrullah et al., 2024) using numeric literacy. Additionally, research (N. W. Damayanti et al., 2024) has utilized song lyrics. These three studies focus on mathematics, whereas this researcher focuses on the problem of

qibla direction within Islamic Astronomy studies. Although the calculations of the qibla direction cannot be detached from the studies in mathematics, the two fields intersect in this context. Discussing qibla direction research in general within the study of Islamic Astronomy is divided into three categories: the legal basis of qibla direction, qibla direction calculations, and qibla direction measurements.

The three research groups are evident in the studies (Saihu, 2022) that examines the legal aspects of the deviation limits of the qibla direction, as well as the study (Faiz, 2020) that discusses the flexibility of the Qibla direction. Additionally, research (Bakhroin, 2020) has conducted calculations of the qibla direction using the haversine formula. The research (Windarni & Setiawan, 2022) performs calculations of the qibla direction using the Vincenty approach, and there is also research (Agus & Damanhuri, 2024) that studies the orientation of the grand mosque buildings in East Java. Furthermore, the study (Amir, 2020) Measures mosques in Makassar. Additionally, research by (Masturi et al., 2021) guides calculating the qibla direction using a smartphone. These studies differ from the research conducted by the researcher, which focuses on aspects related to evaluating learning outcomes in Islamic astronomy on the topic of the qibla direction.

In line with this, the research on the direction of the qibla that focuses on learning aspects includes a study (Solikin et al., 2023) that employs an open-ended question approach in its lectures, and there is also research (Azmi & Ukhti, 2023) aimed at fostering interest in the study of Islamic Astronomy using GeoGebra. Meanwhile, regarding the evaluation of learning outcomes in Islamic Astronomy, the author's search has only found one, namely the research (Solikin, 2019), which discusses the impact of the course on calculating qibla direction and prayer times in students' religious lives. Although it shares similarities with the problem of learning evaluation, this research differs from that study. The research (Solikin, 2019) was conducted in the Islamic Astronomy study program, whereas this research is conducted in the constitutional law class. Law, as previously described by the author, is not identical to a dislike for matters related to calculations.

Based on the explanation above, to assess the results of the efforts made in the constitutional law class, it is necessary to conduct research evaluating students' learning outcomes in that study program. The evaluation of learning outcomes related to the topic of the Qibla Direction Calculation lecture is a differentiator from the previous research that the author has presented. The results of this discussion are also the latest and novelty in research. In line with this, it can generally be stated that this research aims to determine the results of the courses on the direction of the qibla offered in the

Constitutional Law study program at the Faculty of Sharia and Law, UIN Sunan Ampel Surabaya, in the first semester of the 2024/2025 academic year. The research results will ultimately examine the course of Islamic Astronomy through the constructivist theory, which posits that learning outcomes can modify or refine previous knowledge (Lukman et al., 2024). Furthermore, it is hoped that this material on the direction of the qibla can serve as a training medium for students to develop problem-solving skills related to determining the qibla direction, which integrates normative legal foundations with mathematics (SUPINI, 2023). Meanwhile, problem-solving skills are fundamental for students in the learning process (Palupi & Andrijati, 2024).

METHOD

This type of research employs a mixed-methods approach, combining descriptive qualitative and quantitative methods through a case study conducted in the Law class (Sholikhah, 2016). It discusses the Learning Outcomes of Calculating the Qibla Direction Using the cosine and sine formulas in the Islamic Astronomy course in the Constitutional Law class at the Faculty of Sharia and Law, UIN Sunan Ampel Surabaya. The data in this study consist of scores from two questionnaires completed by students participating in this course, which were administered before and after the Qibla direction lecture was conducted. The data collection technique used was a dichotomous scale questionnaire, which provided two closed-answer options: 'yes' and 'no' (Pranatawijaya et al., 2019). The questionnaire consists of 5 questions that reflect students' knowledge regarding the theory and practice of calculating the qibla direction using the cosine and sine formulas of spherical triangles. The list of questions used in the questionnaire is shown in the following table:

Table 1. List of Questions

No.	Question	Yes	No
1.	The direction of the qibla is only toward the west		
2.	There are two possible directions for the qibla, namely, east and west		
3.	The mosque's prayer rows are aligned to the west, and some are tilted, due to considerations of fiqh and mathematics		
4.	I can calculate the direction of the Qibla in Indonesia		
5.	I can calculate the direction of the qibla for areas outside of Indonesia		

Source: Constructed by the Author for Research Purposes

Based on the table above, it can be seen that questions 1 to 3 relate to the student's knowledge aspects regarding the direction of the qibla, while questions 4 and 5 relate to the practice of calculating the qibla direction. The questionnaire was distributed to students before and after attending the lecture that discussed this qibla direction. Next, the collected questionnaire data was analyzed with the provision that each answer selecting 'yes' was given a score of 1. Whereas those selecting 'no' were given a score of 0. The next step was to calculate the total score overall and then compare the total scores before and after the lecture was conducted. The difference between the scores before and after the lecture is then assumed by the author as the level of success of the lecture.

FINDINGS AND DISCUSSION

Findings

To begin the discussion in this section, the author first presents the results of the questionnaire completed by the students who are the subjects of this research. The questionnaire consists of 5 questions. The first to third questions are closely related to knowledge and understanding of the qibla direction. In contrast, the fourth and fifth questions are closely related to the skills of calculating the qibla direction.

In line with this, the research process follows the stages of administering the questionnaire at the beginning, then proceeding to the action stage, which involves delivering the material on calculating the qibla direction, and finally concluding with administering the questionnaire after the action. The questionnaires given at the initial and final stages contain the same questions. The results of the first and second questionnaires are then analyzed to determine the level of change, both related to knowledge and skills.

The author presents the data before the lecture discussing the direction of the qibla in this Constitutional Law class.

Table 2. Data Before Discussion

No.	Question	Yes	No
1.	The direction of the qibla is only toward the west	25	12
2.	There are two possible directions for the qibla, namely, east and west	12	25
3.	The mosque's prayer rows are aligned to the west, and some are tilted, due to considerations of fiqh and mathematics	9	28
4.	I can calculate the direction of the Qibla in Indonesia	9	28
5.	I can calculate the direction of the qibla for areas outside of Indonesia	1	36

Source: From the Survey Results Before the Discussion

Based on the table above, it is obtained that 67.57% of students stated that the qibla direction is only towards the west (question number 1). Furthermore, regarding the possible qibla directions, which are east and west, 32.43% of students indicated that they were aware of this matter (question number 2). Next, concerning the reality in society that there are mosques whose shafts are aligned with the building direction of the mosque, and some have shafts that are tilted from the direction of the mosque building, students participating in this course stated that 75.68% believe that there is no relation to fiqh and mathematics (question number 3). The table above also shows that 24.32% of respondents stated they could calculate the qibla direction in Indonesia (question number 4). However, when calculating the qibla direction in the world, this value drops to 2.70%, indicating that only this percentage feels capable of doing the calculation (Question number 5).

This initial data is a foundation for researchers to take action in the classroom within the Constitutional Law Study program. The action begins with dividing the students into seven groups. Each group listens to the lecturer's presentation regarding the Islamic legal basis for facing the direction of the qibla. The legal basis for facing the qibla includes Q.S. Al-Baqarah, verse 144. The provisions contained in that legal basis are then related to studies in mathematics and astronomy. In mathematics, the study is related to the Cartesian coordinate system, while astronomy is related to the study of the geographical location of a place.

In line with this, in the subsequent process of carrying out this action, the researcher used an open-ended question approach to deliver the material in the Qibla direction. The implementation of this approach began by dividing the students into seven groups, with each group receiving a worksheet to create a Cartesian coordinate system. Next, each group determined 10 different points and chose one point to be the reference. Subsequently, the other nine points were connected to the reference point. After connecting and forming lines, the formed lines were asked to determine their direction, according to the agreed provisions. Based on the work done in this stage, the qibla direction may be to the west or east. When connected with the north and south directions, the qibla direction may have four possibilities: northeast, northwest, southeast, and southwest (Solikin et al., 2023)

After understanding the concept of direction and the possible direction of the qibla, as explained in the materials on the qibla direction with the open-ended question approach, the next step is related to calculating the qibla direction. The calculation of the qibla direction used in this

stage is based on the cosine and sine formulas in spherical triangles. To facilitate understanding of this pre-calculation process, the researcher has prepared a worksheet for calculating the qibla direction, which follows the following steps:

1. Determine the latitude and longitude coordinates of the location where the calculations will be performed.
2. Determine the coordinates of the latitude and longitude of the location of the Kaaba.
3. Determine the value of the longitudinal difference between the location to be calculated and the longitude of the Kaaba (Azhari, 2007). The provisions for this calculation are as follows;
 - a. If the longitude of the location for which the qibla direction will be calculated is between $00^{\circ} 00'$ and $39^{\circ} 50'$ east, then $C = 39^{\circ} 50' - \lambda_B$, with the qibla facing east.
 - b. If the longitude of the location for which the qibla direction will be calculated is between $39^{\circ} 50'$ and $180^{\circ} 00'$ east, then $C = \lambda_B - 39^{\circ} 50'$, with the qibla facing west.
 - c. If the longitude of the location for which the qibla direction will be calculated is between $00^{\circ} 00'$ and $140^{\circ} 10'$ west, then $C = \lambda_B + 39^{\circ} 50'$, with the qibla facing east.
 - d. If the longitude of the location for which the qibla direction will be calculated is between $140^{\circ} 10'$ and $180^{\circ} 00'$ west, then $C = 320^{\circ} 10' - \lambda_B$, with the qibla facing west.
4. Calculating the direction of the qibla using the formula (Solikin, 2020).

$$\tan B = \frac{\sin C}{\cos \phi_B \tan \phi_A - \sin \phi_B \cos C}$$

5. The calculating tool used in this calculation process is a calculator.

The lecture activities are continued with students listening to examples of calculating the direction of the qibla provided by the instructor. The example of calculating the direction of the qibla in this process takes place in Athens, Greece. Calculation of the qibla direction in Athens, Greece

Makkah	:	Lintang (ϕ_A)	=	$21^{\circ} 25' N$
	:	Bujur (λ_A)	=	$39^{\circ} 50' E$
	:	Lintang (ϕ_B)	=	$37^{\circ} 45' N$
Athena	:	Bujur (λ_B)	=	$23^{\circ} 20' E$ (Included in Category A, so the direction of the qibla is East)

Based on the above data, the following will be obtained.

$$\begin{aligned} \tan B &= \frac{\sin C}{\cos \phi_B \tan \phi_A - \sin \phi_B \cos C} \\ &= \sin C : (\cos \phi_B \tan \phi_A - \sin \phi_B \cos C) \end{aligned}$$

$$\begin{aligned}
 &= \sin 16^0 30' : (\cos 37^0 45' \times \tan 21^0 25' - \sin 37^0 45' \times \cos 16^0 30') \\
 &= -45^0 43' 46.51''
 \end{aligned}$$

How to use the buttons on the calculator

Shift tan ($\sin 16^0 30' : (\cos 37^0 45' \times \tan 21^0 25' - \sin 37^0 45' \times \cos 16^0 30')$) = o,

Based on the results of this calculation, the qibla direction of Athens is $-45^0 43' 46.51''$. This value is measured from the south towards the east. In other words, if measured from the North towards the east, south, and west, the qibla direction of Athens is $180^0 - 45^0 43' 46.51'' = 134^0 16' 13.49''$. The lecture continues with students in their respective groups calculating the direction of the qibla, adhering to the four criteria outlined in point two. The results of the students' calculations can be seen in the following image:

Handwritten student work for Student A. The calculation shows the qibla direction for Athens as $-45^0 43' 46.51''$. The student has written the formula and the result clearly.

Figure 1. Student A

Handwritten student work for Student B. The calculation shows the qibla direction for Athens as $-45^0 43' 46.51''$. The student has written the formula and the result clearly.

Figure 2. Student B

Handwritten student work for Student C. The calculation shows the qibla direction for Athens as $-45^0 43' 46.51''$. The student has written the formula and the result clearly.

Figure 3. Student C

Handwritten student work for Student D. The calculation shows the qibla direction for Athens as $-45^0 43' 46.51''$. The student has written the formula and the result clearly.

Figure 4. Student D

The image above is the final part of the actions taken in this research. Next, an evaluation of the lecture results is carried out by providing the same questionnaire as before the lecture. The results of the questionnaire after this lecture are presented in the table below:

Table 3. Data After Discussion

No	Question	Yes	No
1.	The direction of the qibla is only toward the west	2	35
2.	There are two possible directions for the qibla, namely, east and west	35	2
3.	The mosque's prayer rows are aligned to the west, and some are tilted, due to considerations of fiqh and mathematics	36	1
4.	I can calculate the direction of the Qibla in Indonesia	35	2
5.	I can calculate the direction of the qibla for areas outside of Indonesia	30	7

Source: From the Survey Results after the Discussion

Based on the table above, the data shows that 5.41% of students stated that the qibla direction is only to the west, which simultaneously indicates that there are 94.59% of students understand that the qibla direction is not only likely to be to the west (question number 1). Furthermore, regarding the possible qibla directions of east and west, 94.59% of students stated that they are aware of this matter (question number 2). The data from question number 2 also confirms the data from question 1. Next, regarding the reality in the community's life, there are mosques whose shafts are aligned with the direction of the mosque building. There are also those whose shafts are tilted from the direction of the mosque building. Students participating in this course stated that 75.68% believe this is related to fiqh and mathematics (question number 3). The table above also shows that 94.59% stated that they can calculate the direction of the qibla in Indonesia (question number 4). However, for calculating the qibla direction in the world, 81.08% stated they can perform the calculations (question number 5).

In line with this, it can be understood that the action of providing material on the direction of the qibla in this Constitutional Law class has resulted in a change in knowledge regarding the direction of the qibla, where initially 67.57% of students stated that the direction of the qibla was only to the west, which decreased to 5.41%. This value is consistent with the results of question 2, which showed that 32.43% indicated that the possible directions of the qibla were west and east before the action was taken. After the action, this value increased to 94.59%. Related to the knowledge of the qibla direction, from question number 3, regarding the reality in the community that there are mosques whose shafts are straight in line with the direction of the mosque building and there are also those whose shafts are tilted from the direction of the mosque building, 24.32% of the students participating in this course stated that this has no relation to fiqh and mathematics. After being given intervention, this value increased to 75.68%. This data shows that questions 1 and 2 experienced an equal increase of 62.16%, while question three experienced a change of 72.97%. If the average increase is calculated for these three questions, it will show a value of 65.77%. This value is what the author uses as the change in this course related to knowledge of the qibla direction.

In line with these results, the research findings also indicate changes related to the skills of calculating the direction of the qibla. Before the study, only 24.32% stated they could perform calculations for the direction of qibla, which increased to 94.59%. This increase also occurred in the skills of calculating the qibla direction in areas outside of Indonesia. Before providing qibla calculation materials, only 2.70% stated they could perform calculations for the direction of qibla

worldwide. This figure increased to 81.08%. The average increase in skills in calculating the direction of the qibla yields an overall increase of 74.32%.

Discussion

A learning process at all levels is not only aimed at transferring knowledge, but more importantly, the learning process seeks to shape scientific thinking and apply it in real life. The theory of constructivism posits that successful learning can transform and enhance existing knowledge (Firdaus et al., 2023). In line with this, the lecture on the direction of the qibla in the Islamic astronomy course under the Constitutional Law program at the Faculty of Shariah and Law, UIN Sunan Ampel Surabaya, aims to foster a comprehensive understanding among students regarding the direction of the qibla. This thorough understanding includes the fundamental aspects of the legal basis of the qibla, as well as its mathematical and astronomical aspects. To measure success and the achievement of these goals, the researcher compared questionnaire data before and after the course.

The changes in the questionnaire answers provided by the lecture participants reflect the level of success of the lectures. The questionnaire compiled by the researcher consists of five questions. The first to third questions are closely related to the aspect of knowledge about the direction of the qibla. Meanwhile, the fourth and fifth questions are closely associated with calculating the direction of the qibla. The changes in the participants' answers to each of these questions will be elaborated on in sequence.

The description begins with the first question item. Before the lecture, a majority of the participants, specifically 25 students, stated that the direction of the qibla is only towards the west. After the lecture was conducted, the number of students holding this view decreased, with only two students remaining steadfast in maintaining that the qibla direction was solely towards the west. The responses from students before and after this lecture indicate a significant change in their understanding of the qibla direction. Students began to understand that the qibla direction depends on the geographical location of each place rather than being solely oriented towards the west (Mustaqim, 2021).. This understanding among students aligns with studies in Islamic Astronomy, which indicate that determining the qibla direction is closely related to the latitude and longitude of each location worldwide (Cahyani et al., 2022).

Changes among students related to the understanding of the direction of the qibla, as mentioned above, are confirmed by the students' responses to item question number two in the

questionnaire. The number of students stating that there are two possible directions for the qibla, namely east and west, increased from 12 people to 35 people after the lecture was conducted. This change indicates a new awareness among the students participating in this lecture that the qibla direction can vary depending on the location. For example, in Indonesia, the qibla faces west, whereas in parts of Europe, such as Spain, it faces east. This difference aligns with the principle of direction in mathematical studies, which always indicates the shortest distance between different places (Sianipar et al., 2021). This change also shows that the lecture has successfully instilled the concept of the qibla direction, indicating that there are two possible qibla directions in this world, namely east and west (Thoyfur, 2021).

Related to the studies in fiqh, it is known that before this lecture took place, only nine students stated that they were aware of the relationship between the shaft in performing prayers and fiqh, as well as mathematics. After the lecture, this number changed to 36 students, indicating an increase of about 27 students. This increase suggests that students are beginning to understand the concept that the direction of the Qibla is not only a normative issue related to its fiqh but also involves mathematical considerations in its determination (Putra et al., 2025). This result also demonstrates students' understanding of the integration of knowledge in determining the accuracy of the Qibla direction, which is one of the conditions for the validity of prayer (Yanto & Izzuddin, 2025).

The first three questions in the questionnaire relate to knowledge, while the fourth and fifth questions pertain to skills in calculating the direction of the qibla. The author explains the discussion regarding changes in knowledge about the direction of the qibla. Next, the discussion continues on the aspect of skills. The discussion begins with the fourth question in the questionnaire, followed by the fifth question. The fourth questionnaire item shows a change between before and after the lecture. The change from 9 students to 35 students who stated they could calculate the qibla direction for Indonesia reflects a significant shift in the skill of calculating the qibla direction. This result also indicates that the astronomy lecture on the qibla direction material in this law class not only succeeded in providing a theoretical understanding but also in developing technical skills related to calculating the qibla direction (Zakaria & Yusuf, 2023).

In line with the results from the fourth question, changes are also observed in the aspect of skills required to calculate the qibla direction for areas abroad. Before the qibla direction lectures were conducted, only one student reported being able to calculate the qibla direction for foreign

regions. After the lectures, the data underwent a drastic change, with 30 students stating they were able to calculate the qibla direction for areas outside the country. This result indicates the success of the lectures in broadening students' global perspectives. Simply put, the calculation of the qibla direction for regions outside the country is performed in the same manner as for areas within the country. However, it is essential to understand the rules governing the calculation of the longitudinal distance of the location (Hariadi, 2024). In line with this, the ability to calculate the qibla direction for areas outside the country becomes very important for students to understand as a preparation for global life and diaspora.

CONCLUSION

Based on the research that has been conducted, the provision of material on the direction of the qibla in the law class, namely the Constitutional Law of the Sharia and Law Faculty of UIN Sunan Ampel Surabaya, has increased knowledge about the direction of the qibla and skills in calculating the direction of the qibla. Related to the knowledge of the direction of the qibla, there was an improvement of 65.77%. Meanwhile, regarding the skills in calculating the direction of the qibla, there was an increase of 74.32%. The average increase in these two aspects yields an improvement value of 70.05%. Research also shows a significant change between before and after the Islamic astronomy lectures. Before the lectures, students had an understanding that the direction of the qibla was absolutely towards the west, which changed to the understanding that there are two possible directions for the qibla, namely east and west, depending on the geographical location of each place. Before the lectures, the skills in calculating the direction of the qibla were very low among those who had mastered it, but this changed as many stated that they had the ability to perform calculations for the direction of the qibla, both in Indonesia and abroad.

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