

Analysis of Qibla Direction Accuracy Testing Using Right-Angled Triangles by Slamet Hambali at the Musalla of IAIN Kerinci Campus from a Fiqh Perspective

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Abstract: The direction of the Qibla is very important in Islamic prayer, as errors in determining it can affect the validity of the worship. This study aims to explore the methods used in determining the Qibla direction in mosques and to evaluate their accuracy by applying the right-angled triangle method as well as fiqh analysis. This research is qualitative, employing a field research strategy that utilizes the right-angled triangle approach formulated by Slamet Hambali and fiqh. The main source used is the book *Ilmu Falak* on the determination of prayer times and Qibla directions worldwide. Data were obtained through interviews, observations, and documentation, and then analyzed through the processes of reduction, presentation, data verification, and conclusion. Research findings indicate that the qibla direction at the Prayer Room of Campus One of the State Islamic Institute of Kerinci is still determined manually, relying on the position of the sun. Meanwhile, based on astronomical calculations, the qibla direction of the Prayer Room at Campus One of the State Islamic Institute of Kerinci is at an azimuth of $295^{\circ} 18' 17.3''$. After an accuracy test was conducted, there was a deviation of 18° from the azimuth direction, which exceeds the qibla tolerance according to Islamic jurisprudence scholars, which is 2° . Therefore, this study implies that it is recommended to reconstruct the qibla direction to ensure alignment with the Kaaba for the perfection of prayer practice.

Keywords: Accuracy test; qibla direction; right-angled triangle; fiqh.

Introduction

The issue of the direction of the qibla is very important to discuss because it is closely related to the performance of various acts of worship for Muslims.¹ Accuracy in determining the direction of the qibla is considered a crucial element for the correctness of facing the direction of prayer for a Muslim in worship.² However, in fact, there are still errors in determining the direction of the qibla. Errors in the correctness of the direction of the qibla are defined as inaccuracies in the direction of the qibla from what it should be, which is towards the Ka'aba.³ Errors in determining the direction of the qibla also have an impact on the position and shape of the buildings used by Muslims for prayer, namely mosques, mushola, and even their own homes. A deviation of 1° from the azimuth

¹ Sunarto and Muhammad Hariyadi, "Thematic Interpretation Study in Determining Indonesia's Qibla through Takhsis," *Esensia: Jurnal Ilmu-Ilmu Ushuluddin* 23, no. 2 (2022): 208–21, <https://doi.org/10.14421/esensia.v23i2.3917>.

² Dian Maharany, Nur Aisyah, and Kiljamiawati, "Uji Akurasi Pengukuran Arah Kiblat Masjid Dan Makam Di Desa Saotengah Kecamatan Sinjai Tengah Kabupaten Sinjai," *HISABUNA: Jurnal Ilmu Falak* 4, no. 2 (2023): 158–73, <https://doi.org/10.24252/hisabuna.v4i2.38462>.

³ Reza Akbar and Asman, "Social Conflict Due To the Controversy of Mosque's Qibla Direction in Sejiram Village, Sambas Regency," *Jurnal Ilmiah Al-Syir'ah* 18, no. 1 (2020): 1–12, <https://doi.org/10.30984/jis.v18i1.926>.

direction can cause a shift in position of 138,3 km from the Kaaba.⁴ Meanwhile, Dhiauddin Tanjung states that a deviation of 1° causes a shift of 111,219 km.⁵ Even a small error in direction can have a big impact in a geographical context, especially if the deviation is several degrees.

The researcher attempted to determine the qibla direction of the mushola building at Campus 1 of IAIN Kerinci, which serves as the central place of worship for students to perform their prayers. Therefore, it is crucial to determine and verify the accuracy of the qibla direction of the Mosque building, as any error in determining the qibla direction will impact the validity of our prayers. This is because the requirement for a prayer to be valid is to face the qibla as agreed upon by all imams of the madhhab.⁶ The requirements for validity are conditions that must all be fulfilled for the prayer to be valid. However, if even one of them is omitted, the prayer is invalid.⁷

A study relevant to this research was conducted by M. Arbisora Angkat, entitled "*Study Analysis on Determining the Qibla Direction of Al-Mashun Grand Mosque in Medan*," using Rashdul Kiblat and a Garmin GPS 60. The results of his research stated that Syeh Hasan Maksum, an expert in the field of astronomy, determined the direction of the Qibla of the Al-Mashun Grand Mosque. The direction of the mosque's Qibla was declared to be correct, even though there was a slight deviation of 0° 34' 22.58". This deviation may be due to the lack of sophisticated tools and technology, considering that the mosque is more than a century old.⁸

Furthermore, there is a study conducted by Andi Molawaliada Patodongi, Muh Rasywan Syarif, and Zulhas'ari entitled "*Accuracy Test of the Qibla Direction at Al-Mujahidin Mosque (Old Watampone Mosque) Using Qiblat Tracker, Istiwa' Rod, and Google Earth*," which focused on testing the accuracy of the qibla direction using these three tools. The results of the study stated that the difference in latitude between the *Istiwa'* Stick was 0° 2' 20.75" while the difference in longitude was 0° 8' 10". Furthermore, the difference in latitude between GPS and Google Earth was 0° 0' 0.05". For the direction of the qibla, the results found were 294° 28' 43.00" for the *Istiwa'* Stick, 294° 30' 03.00" for GPS, and 294° 30' 03.00" for Google Earth. From this data, the conclusion of the study in terms of practicality and accuracy is that the order starts from GPS, Google Earth, and the *Istiwa'*.⁹

Anisah Budiwati, in her research entitled "*The Sextant, Global Positioning System (GPS), and Google Earth for Determining Earth's Coordinate Points and Their Application in Determining the Qibla Direction*," used an *istiwa'* stick, a GPS device, and the Google Earth application to determine the latitude and longitude of a location and to accurately determine the angle of the direction of qibla. Her research results stated that there was a discrepancy in the direction of the qibla at the Selaparang

⁴ Tono Saksono, Mohamad Ali Fulazzaky, and Zamah Sari, "Geodetic Analysis of Disputed Accurate Qibla Direction," *Journal of Applied Geodesy* 12, no. 2 (2018): 129–38, <https://doi.org/10.1515/jag-2017-0036>.

⁵ Dhiauddin Tanjung, "Deviation of Qicblat Direction at Mosque/Musala in Deli Serdang District, North Sumatra," *El-Hekam: Jurnal Studi Keislaman* 8, no. 2 (2023): 299–316, <https://doi.org/10.31958/jeh.v8i2.7863>.

⁶ A. Jamil, Sakirman, and Moelki Fahmi Ardliansyah, "Penentuan Arah Kiblat Dengan Posisi Matahari Di Pusat Ibu Kota Kabupaten Lampung," *Al-Manahij: Jurnal Kajian Hukum Islam* 16, no. 1 (2022): 133–48, <https://doi.org/10.24090/mnh.v16i1.6169>.

⁷ Abu Abbas Zain Musthofa Al-Basuruwani, *Fiqh Shalat Lengkap* (Yogyakarta: Laksana, 2018).

⁸ M. Arbisora Angkat, "Studi Analisa Penentuan Arah Kiblat Masjid Raya Al-Mashun Medan," *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan* 2, no. 1 (2016): 34–44, <https://doi.org/10.30596/jam.v2i1.764>.

⁹ Andi mola waliada Patodongi, Muh Rasywan Syarif, and Zulhas'ari, "Uji Akurasi Arah Kiblat Masjid Al-Mujahidin (Masjid Tua Watampone) Menggunakan Qiblat Tracker, Tongkat Istiwa' Dan Google Earth," *HISABUNA: Jurnal Ilmu Falak* 3, no. 2 (2022): 21–35, <https://doi.org/10.24252/hisabuna.v3i2.28469>.

Kingdom Tomb in East Lombok of $26^{\circ} 48' 9.62''$ from the qibla azimuth of $293^{\circ} 25' 55.62''$ measured with the *istiwa'aini*.¹⁰

Thus, the purpose of this study was to examine the method of determining the direction of the qibla at the Mushola Campus 1, IAIN Kerinci, and to test its accuracy using the right-angled triangle approach developed by Slamet Hambali and Fiqh. This is because the IAIN Kerinci Campus 1 Mushola is a gathering place and place of worship for students who need certainty in performing their prayers and maintaining the welfare of the IAIN Kerinci Campus 1 community.

Method

This study uses a qualitative method conducted through field research.¹¹ The main focus of this study is to analyze the accuracy of the qibla direction at the Campus 1 IAIN Kerinci Mushola. This study uses the right-angled triangle approach developed by Slamet Hambali. Data was collected through interviews, observation, and documentation.¹² The interviews were conducted by asking questions related to the Mushola Campus 1 IAIN Kerinci to the former Head of General Affairs, who was also the Treasurer of Development at that time. Then, observations were carried out by directly calculating the direction of the qibla at the IAIN Kerinci Campus 1 Mushola using trigonometry theory and a right-angle triangle protractor. Furthermore, documentation was carried out by collecting books and articles related to the direction of the qibla. The data analysis technique used was descriptive, which clearly described the calculation process and findings in the study.¹³ The first step was to calculate the direction of the qibla. After the results were found, the measurement practice was carried out by determining the true north direction of the prayer room, then positioning the right-angled triangle protractor at the true north location, and then adjusting the calculation results with the degrees on the protractor.

Results and Discussion

The Direction of Qibla in Islam

In Islam, the direction of the qibla is used as a guide when performing prayers, reciting the Qur'an, performing tawaf, and burying the dead. In Arabic, the word referring to the term "direction" is known as *jihah* or *syathrah*, and is also known as qiblah, which is rooted in the word *qabala - yaqbulu*, which means "to face".¹⁴ According to the al-Munawwir Dictionary, qiblah is defined as the Kaaba, while according to the KBBI, the word refers to the direction of the Kaaba in Mecca.¹⁵ The direction of the qibla is the direction a Muslim faces when performing prayers and when burying a Muslim.¹⁶

¹⁰ Anisah Budiwati, "Tongkat Istiwa', Global Positioning System (GPS) Dan Google Earth Untuk Menentukan Titik Koordinat Bumi Dan Aplikasinya Dalam Penentuan Arah Kiblat," *Al-Ahkam* 26, no. 1 (2016): 65-92, <https://doi.org/10.21580/ahkam.2016.26.1.808>.

¹¹ Feny Rita Fiantika Mohammad Wasil et al., *Metodologi Penelitian Kualitatif* (Padang: PT. Global Eksekutif Teknologi, 2022).

¹² Zuchri Abdussamad, *Metode Penelitian Kualitatif* (Makassar: CV. syakir Media Press, 2021).

¹³ Abdul Fattah Nasution, *Metode Penelitian Kualitatif* (Bandung: CV. Harfa Creative, 2023).

¹⁴ Marpaung Watni, *Pengantar Ilmu Falak* (Jakarta: Kencana, 2015).

¹⁵ Jayusman, *Ilmu Falak 1 Fiqh Hisab Rukyah Penentuan Arah Kiblat Dan Awal Waktu Salat* (Tangerang: Media Edu Pustaka, 2022).

¹⁶ Mohd Kalam Daud, *Ilmu Falak Praktis: Arah Kiblat Dan Waktu Shalat* (Aceh Besar: Sahifah, 2019).

The direction of the qibla referred to is the most direct direction towards the Kaaba. The Indonesian Ministry of Religious Affairs defines the direction of the qibla as the specific direction that Muslims use as a reference point when facing it during prayer.¹⁷ In addition, the direction of the qibla is also used as a guide when slaughtering livestock for sacrifice, aqiqah, and for regular consumption.¹⁸ Facing the direction of the qibla is an important issue in Islamic law.¹⁹ Facing the qibla is a requirement that must be fulfilled for prayer to be valid. If someone prays without facing the qibla, the prayer is considered invalid, except in certain circumstances such as during an emergency or while traveling.²⁰

According to some scholars, facing the qibla means directing one's body towards the Kaaba, which Allah SWT has determined as the qibla for Muslims.²¹ It is important to understand that the qibla and the Kaaba have similar meanings, where the Kaaba refers to the physical building, while the qibla is the direction that a Muslim faces when praying.²² The command to face the qibla is written in Surah Al-Baqarah, verses 144, 149, and 150.

قَدْ نَرَى تَقَلُّبَ وَجْهِكَ فِي السَّمَاءِ فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضَاهَا فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا
وُجُوهَكُمْ شَطْرَهُ وَإِنَّ الَّذِينَ أُوتُوا الْكِتَابَ لَيَعْلَمُونَ أَنَّهُ الْحَقُّ مِنْ رَبِّهِمْ وَمَا اللَّهُ بِغَافِلٍ عَمَّا يَعْمَلُونَ

Meaning: Indeed, we see you (O Prophet) turning your face towards heaven. Now, we will make you turn towards a direction (of prayer) that will please you. So turn your face towards the Sacred Mosque (in Mecca) – wherever you are, turn your faces towards it. Those who were given the Scripture certainly know this to be the truth from their Lord. And Allah is never unaware of what they do.²³

The word masjid al-haram in the verse is referred to as the direction in which every Muslim must face when performing prayer. Ali al-Shabuni explains that the word masjid al-haram has four meanings, namely²⁴: First, it means the Kaaba, namely *jihāt al-ka'bah* (the direction of the Kaaba). Second, it means the entire building of the Masjid al-Haram, as stated in the hadith narrated by Imam Ahmad:

صَلَاةٌ فِي مَسْجِدِي هَذَا خَيْرٌ مِنْ أَلْفِ صَلَاةٍ فِيَمَا سِوَاهُ إِلَّا الْمَسْجِدَ الْحَرَامَ

Meaning: Praying in my mosque is better than praying a thousand times in other mosques, except for the Grand Mosque.

¹⁷ Muhammad Awaludin, "Re-Interpretasi Keabsahan Arah Kiblat Masjid Kuno," *Elfalaky: Jurnal Ilmu Falak* 5, no. 2 (2021): 138–54, <https://doi.org/10.24252/ifk.v5i2.22949>.

¹⁸ Jamil, Sakirman, and Ardliansyah, "Penentuan Arah Kiblat Dengan Posisi Matahari Di Pusat Ibu Kota Kabupaten Lampung."

¹⁹ Suriah Pebriyani Jasmin et al., "The Accuracy of Qibla Direction of Cemeteries Using Modern Qibla Tools," *Jurnal Al-Dustur* 6, no. 2 (2023): 157–75, <https://doi.org/10.30863/aldustur.v6i2.4800>.

²⁰ ABD Karim Faiz and Ahmad, "Historical Analysis and Calibration of the Oldest Al-Mujahidin Mosque, Parepare City," *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan* 9, no. 2 (2023): 145–61, <https://doi.org/10.30596/jam.v9i2.16982>.

²¹ Muhajir Muhajir, Imam Yahya, and Frangky Suleman, "Analysis of Qiblat Direction at Jami Al Iman Mosque Sunan Geseng Loano Purworejo," *Jurnal Ilmiah Al-Syir'ah* 20, no. 2 (2022): 251–62, <https://doi.org/10.30984/jis.v20i2.2013>.

²² Mohd Kalam Daud and Ivan Sunardy, "Pengukuran Arah Kiblat Menggunakan Alat Modern Menurut Perspektif Ulama Dayah (Studi Kasus Di Kabupaten Pidie)," *El-USRAH: Jurnal Hukum Keluarga* 2, no. 1 (2019): 1–10, <https://doi.org/10.22373/ujhk.v2i1.7639>.

²³ Lajnah Pentashihan Mushaf Al-Qur'an, *Al-Qur'an Dan Terjemahannya* (Badan Litbang Dan Diklat Kementerian Agama RI, 2019).

²⁴ Muhammad Ali Shabuni, *Rawai' Al-Bayan: Tafsir Ayat Al-Ahkam Min Al-Qu'an* (Makkah: Dar al-kutub al-Islamiyah, 1999).

Third, the city of Mecca. The word Masjid al-Haram, meaning the city of Mecca, is based on Surah al-Isra' verse 1 because the Prophet did not depart from Masjid al-Haram during the Isra', but departed from the city of Mecca, which contains Masjid al-Haram. Fourth, the city of Mecca and its surroundings, known as al-Haram.

Surah Al-Baqarah, verses 149-150 read:

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَإِنَّهُ لَلْحَقُّ مِنْ رَبِّكَ وَمَا اللَّهُ بِغَافِلٍ عَمَّا تَعْمَلُونَ وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ لِئَلَّا يَكُونَ لِلنَّاسِ عَلَيْكُمْ حُجَّةٌ إِلَّا الَّذِينَ ظَلَمُوا مِنْهُمْ فَلَا تَخْشَوْهُمْ وَاخْشَوْنِي وَلَا تَمِ نِعْمَتِي عَلَيْكُمْ وَلَعَلَّكُمْ تَهْتَدُونَ

Meaning: Wherever you are (O Prophet), turn your face towards the Sacred Mosque. This is certainly the truth from your Lord. And Allah is never unaware of what you (all) do. Wherever you are (O Prophet), turn your face towards the Sacred Mosque. And wherever you (believers) are, face towards it, so that people will not argue against you, except the wrongdoers among them. Do not fear them; fear Me, so that I may (continue to) perfect My favour upon you and so you may be (rightly) guided.²⁵

Regarding the interpretation of the verse concerning the obligation to face the qiblah, Imam al-Qurtubi argues that there are at least four issues, namely: First, the word *شَطْرَ الْمَسْجِدِ الْحَرَامِ*, which is interpreted as the direction of the Kaaba; scholars differ on the concrete object of this direction. Second, there is no disagreement among scholars that the Kaaba is the direction of the qibla from all directions. Scholars also agree that for those who can see the Kaaba, it is obligatory to face the Kaaba directly. Third, scholars differ on the obligation to face the qibla for those who cannot see the Kaaba directly. Among the scholars, some argue that it is obligatory to face the Kaaba itself. However, this opinion is refuted by Imam Ibn al-Arabi and is considered a weak opinion. This is because it would have an impact on *taklif* (compulsion) for those who are unable to do so. Fourth, this verse provides clear evidence for the opinion of Imam Malik and the scholars who agree with him, that the ruling for a person praying is to look forward, not at the place of prostration.²⁶

In addition to the arguments mentioned above, the requirement to face the qiblah is also commanded in the hadith narrated by Imam Bukhari and Muslim, which states:

عن أبي هريرة رضي الله عنه قال: قال النبي صلى الله عليه وسلم إذا قُئِمْتَ إِلَى الصَّلَاةِ فَأَسْبِغِ الوُضُوءَ ثُمَّ اسْتَقْبِلِ الْقِبْلَةَ وَكَبِّرْ (رواه بخارى ومسلم)

Meaning: From Abu Hurairah, may Allah be pleased with him, the Prophet SAW said: When you want to pray, perfect your ablution, then face the qiblah and say the takbir.²⁷

History records that the Kaaba was not the first qibla towards which people faced when praying. Before the Kaaba became the qibla, Muslims faced Jerusalem in Palestine.²⁸ Jerusalem or

²⁵ Lajnah Pentashihan Mushaf Al-Qur'an, *Al-Qur'an Dan Terjemahannya*.

²⁶ Abu Abdillah Muhammad Al-Qurthubi, *Al-Jami' Li Ahkam Al-Qur'an* (al-Maktabah al-Syamilah, n.d.).

²⁷ Watni, *Pengantar Ilmu Falak*.

²⁸ Ayu Putri Zahara and Susiknan Azhari, "X-Blind Qibla Accuracy Test with Google Earth Standard," *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan* 10, no. 2 (2024): 105–23, <https://doi.org/10.30596/jam.v10i2.22329>.

Baitul Maqdis was once the qibla towards which people faced before the revelation regarding facing the Kaaba was revealed.²⁹ This is explained in the Qur'an Al-Baqarah 143:

وَكَذَلِكَ جَعَلْنَاكُمْ أُمَّةً وَسَطًا لِتَكُونُوا شُهَدَاءَ عَلَى النَّاسِ وَيَكُونَ الرَّسُولُ عَلَيْكُمْ شَهِيدًا ۗ وَمَا جَعَلْنَا الْقِبْلَةَ الَّتِي كُنْتَ عَلَيْهَا إِلَّا لِنَعْلَمَ مَنْ يَتَّبِعِ الرَّسُولَ مِمَّنْ يَنْقَلِبُ عَلَى عَقْبَيْهِ ۗ وَإِنْ كَانَتْ لَكَبِيرَةً إِلَّا عَلَى الَّذِينَ هَدَى اللَّهُ ۗ وَمَا كَانَ اللَّهُ لِيُضَيِّعَ إِيمَانَكُمْ ۗ إِنَّ اللَّهَ بِالنَّاسِ لَرَءُوفٌ رَحِيمٌ

Meaning: And so We have made you (believers) an upright community so that you may be witnesses over humanity and that the Messenger may be a witness over you. We assigned your former direction of prayer only to distinguish those who would remain faithful to the Messenger from those who would lose faith. It was certainly a difficult test except for those (rightly) guided by Allah. And Allah would never discount your (previous acts of) faith. Surely Allah is Ever Gracious and Most Merciful to humanity.³⁰

The effort to find and measure the correct direction of the qibla is an essential part of performing prayer.³¹ During the process of determining the direction of the qibla, inaccuracies sometimes occur due to several factors, such as relying on the direction of the qibla of an existing mosque, the accuracy of which is still doubtful; determining it based on a figure who may not necessarily be qualified because of their prominence alone; using inappropriate tools; shifts in the direction of the qibla during construction; and the belief that the direction of the qibla is west.³² The direction of the qibla must be determined as accurately as possible, because even a deviation of a few degrees can cause a deviation towards a direction other than the Kaaba.³³

Methods for Determining the Direction of Qibla According to Slamet Hambali

Slamet Hambali states that in Indonesia, there are five main methods for determining the direction of qibla, namely the *istiwa'* stick, compass, global *rash al-qiblah*, local *rash al-qiblah*, and theodolite.³⁴ In addition, Slamet Hambali also developed another method using the principle of right-angled triangles.³⁵ The *istiwa'* stick is used by observing the sun's shadow that appears before and after *zawal* to determine the actual west and east directions. Once these directions are found, the *rubu' mujayyab* tool is used to measure the qibla direction more accurately.

²⁹ Fauziah, "Validasi Arah Kiblat Masjid Dengan Bayang-Bayang Kiblat (Studi Kasus Masjid Di Kecamatan Ilir Barat II Kota Palembang)," *Nurani: Jurnal Kajian Syari'ah Dan Masyarakat* 18, no. 2 (2018): 99-114, <https://doi.org/10.19109/nurani.v18i2.1880>.

³⁰ Lajnah Pentashihan Mushaf Al-Qur'an, *Al-Qur'an Dan Terjemahannya*.

³¹ Sayehu and Aspandi, "Fiqh and Astronomical Rashdul Qibla; Determining the Direction of the Qibla by Using a Stellarium," *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan* 9, no. 1 (2023): 41-58, <https://doi.org/10.30596/jam.v9i1.14554>.

³² Riza Afrian Mustaqim and Reza Akbar, "Study on the Causes of Inaccuracy of Qibla Direction of the Great Mosque Baitul Makmur West Aceh," *Jurnal Ilmiah Al-Syir'ah* 19, no. 1 (2021): 30-45, <https://doi.org/10.30984/jis.v19i1.1315>.

³³ Yusida Fitriyati and Ifrohati, "Analisis Metode Penentuan Arah Kiblat Masjid Istiqlal Desa Ibul III Kecamatan Pemulutan Kabupaten Ogan Ilir," *Nurani: Jurnal Kajian Syari'ah Dan Masyarakat* 18, no. 2 (2018): 127-44, <https://doi.org/10.19109/nurani.v18i2.1885>.

³⁴ Jayusman, "Akurasi Metode Penentuan Arah Kiblat Kajian Fiqh Al-Ikhtilaf Dan Sains," *ASAS: Jurnal Hukum Ekonomi Syariah* 6, no. 1 (2014): 72-86, <https://doi.org/10.24042/asas.v6i1.1273>.

³⁵ Slamet Hambali, *Ilmu Falak 1 Penentuan Awal Shalat & Arah Kiblat Seluruh Dunia* (Semarang: Program Pascasarjana IAIN Walisongo Semarang, 2011).

The sun's shadow is also used in the global *rash al-qiblah* and local *rash al-qiblah* methods. *Rash al-qiblah* is a natural phenomenon that can be used to accurately determine the direction of the qibla.³⁶ Global *rash al-qiblah* occurs when the sun is directly overhead in Mecca, so that the shadow of any object points directly towards Mecca. This phenomenon occurs on May 28 and July 16. Meanwhile, *rash al-qiblah* local is a method of using the daily position of the sun as it crosses the city of Mecca to determine the direction of the qibla.

In subsequent developments, Indonesians began to use compasses to determine direction, which were then used to determine the direction of the qibla. After that, an instrument called a theodolite was also used. This instrument is generally used in mapping or geographic surveying activities. However, it can also be used to determine the direction of the qibla.³⁷ The method chosen to determine the direction of the qibla will affect its accuracy.³⁸

The Direction of the Qibla According to Scholars

Fiqh scholars agree that facing the qibla when performing prayer is a requirement for the validity of one's prayer. Those who are in the vicinity of the Kaaba and can see it directly are required to face the building itself when praying (*'ain al-ka'bah*).³⁹ Meanwhile, those who are far from the Kaaba are required to make an effort to find the correct direction so that they are facing the Kaaba.⁴⁰

In the view of the Hanafi school of thought, for those who cannot see the Kaaba directly, the direction of the qibla is sufficient to be directed towards the Kaaba (*jihat al-ka'bah*), not the physical building itself.⁴¹ This opinion is in line with the Maliki school of thought, which also emphasizes that those who live far from the Kaaba only need to face the direction of the Kaaba.⁴² The Hambali school of thought holds a similar opinion, namely that a person who cannot see the Kaaba is not required to face the building, but only needs to face its direction.⁴³ The argument they use to support this opinion is the same as that used by those who argue that prayer outside the Masjid al-Haram must face *'ain al-ka'bah*, namely Surah al-Baqarah, verse 144. However, they differ in their interpretation of two words that indicate *musytarak*, namely the words *syamrah* and *masjid al-haram* found in that verse. The scholars who state that people praying outside the Grand Mosque must still face the *'ain al-ka'bah* interpret the word *syamrah* as *'ain*, while the scholars who state that people praying outside the Grand Mosque only need to face the direction of the Kaaba interpret the word *syamrah* as *jihhah*. The non-obligation to face *'ain al-ka'bah* for people who pray outside the Masjid al-Haram is also based on the hadith which reads: "What is between the east and the west is the qiblah". Imam al-Shon'ani, in relation to this hadith, emphasized that this hadith indicates that what is

³⁶ Sakirman Sakirman, "Formulasi Baru Arah Kiblat: Memahami Konsep Rasydul Kiblat Harian Indonesia," *Al-Qisthu: Jurnal Kajian Ilmu-Ilmu Hukum* 16, no. 1 (2018): 1-8, <https://doi.org/10.32694/010440>.

³⁷ Jayusman, "Akurasi Metode Penentuan Arah Kiblat Kajian Fiqh Al-Ikhtilaf Dan Sains.

³⁸ Nada Putri Rohana, "Accuracy of Qibla Direction of the Mosque with the Qibla Shadows and Rashdul Qibla Methods," *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan* 10, no. 1 (2023): 35-49, <https://doi.org/10.30596/jam.v10i1.17117>.

³⁹ Bustanul Iman RN, "Peranan Arah Kiblat Terhadap Ibadah Shalat," *Diktum: Jurnal Syari'ah Dan Hukum* 15, no. 2 (2017): 247-60, <https://doi.org/10.35905/diktum.v15i2.439>.

⁴⁰ Ahmad Musonnif, *Ilmu Falak* (Yogyakarta: Teras, 2011).

⁴¹ Hambali, *Ilmu Falak 1 Penentuan Awal Shalat & Arah Kiblat Seluruh Dunia*.

⁴² Awaludin, "Re-Interpretasi Keabsahan Arah Kiblat Masjid Kuno."

⁴³ Sayful Mujab, "Kiblat Dalam Perspektif Mazhab Mazhab Fiqh," *Yudisia: Jurnal Pemikiran Hukum Dan Hukum Islam* 5, no. 2 (2014): 317-43, <http://dx.doi.org/10.21043/yudisia.v5i2.709>.

obligatory is to face the direction of the Kaaba (*jihat al-ka'bah*), not to face the Kaaba building (*'ain al-ka'bah*), that is, for people who cannot see the Kaaba building.

The fiqh scholars all agree on the obligation to face *'ain al-ka'bah*. Ibn Qudamah explains as follows: "If someone can directly see the Kaaba, then he must pray facing the physical structure of the Kaaba. We do not know of any difference of opinion on this matter." Ibn 'Aqil said, "If part of his body deviates from the direction of the Kaaba, then his prayer is invalid."

As for those who pray outside the Masjid al-Haram and cannot see the Kaaba directly, the fiqh scholars differ in their opinions on facing the qiblah, whether it is necessary to face the *'ain al-ka'bah* or whether it is sufficient to face the Kaaba (*jihat al-ka'bah*). The Shafi'i school of thought has a different view from the previous three schools of thought. According to this school of thought, everyone is required to face the *'ain al-ka'bah*, whether they are near or far from the Kaaba, and they must not deviate even slightly. Their argument is based on Surah al-Baqarah verse 144, where the word "*Syamrah*" in the verse is meant not only to refer to the direction of the qiblah, but must be precisely towards the Kaaba building. According to this school of thought, everyone is required to face the *'ain al-ka'bah*, whether they are close to or far from the Kaaba.

Referring to the four schools of thought, only the Hanafi school of thought provides a specific tolerance limit of 90°, with 45° to the right and 45° to the left.⁴⁴ Meanwhile, other schools of thought do not mention this specifically. Astronomical scholars such as Ahmad Izzudin in "Typology Jihatul Kaaba on Qibla Direction of Mosques of Semarang" state that the reasonable limit for deviation from the qibla direction is 2° from the correct direction.⁴⁵ Meanwhile, according to Anisa Budiwati and Saiful Aziz in "*Akurasi Arah Kiblat di Ruang Publik*," the tolerance for deviation is 6'.⁴⁶ There is also Andi Jusran Kasim, who states that there should be no tolerance limit because the direction of the qibla can be determined with certainty using the appropriate equipment and sunlight.⁴⁷ From these opinions, the author is more inclined to the opinion that states that there is a reasonable tolerance limit for the direction of the qibla, which is 2°.

Based on the above description, Siddiq al-Jawwi emphasizes that for Indonesians who are east of the Grand Mosque, it is basically sufficient to face the direction of the Kaaba (*jihat al-ka'bah*), which is to the west. In our opinion, this is sufficient, and the prayer is valid. Even if it deviates by a few degrees, in our opinion, it can be forgiven, as long as it is still facing west. The fiqh rule states: *Maa qaaraba al-syai'a u'thiya hukmuhu* (whatever is close to something is judged to be the same as that thing).

History of the State Islamic Institute of Kerinci Campus

The State Islamic Institute (IAIN) Kerinci was originally the Sharia Faculty of IAIN Sultan Thaha Saifuddin, located in Kerinci, and was established in 1967. Previously, in 1964, the Muhammadiyah Sharia Faculty had been established in the Sungai Penuh/Kerinci area, led by Dean Sukamto with Sutan Abdullah Arifin serving as faculty secretary. Daud Qahiri and Sutan Abdullah

⁴⁴ Sitti Nurul Iffah Faridah, "Toleransi Arah Kiblat Menurut Mazhab Hanafi Dalam Perspektif Fikih Dan Astronomi" (UIN Walisongo Semarang, 2017), <https://eprints.walisongo.ac.id/id/eprint/12034>.

⁴⁵ Ahmad Izzuddin, "Typology Jihatul Kaaba on Qibla Direction of Mosques in Semarang," *Ulul Albab: Jurnal Studi Dan Penelitian Hukum Islam* 4, no. 1 (2020): 1-15, <https://doi.org/10.30659/jua.v4i1.12186>.

⁴⁶ Anisah Budiwati and Saiful Aziz, "Akurasi Arah Kiblat Masjid Di Ruang Publik," *JSSH (Jurnal Sains Sosial Dan Humaniora)* 2, no. 1 (2018): 159-73, <https://doi.org/10.30595/jssh.v2i1.2275>.

⁴⁷ Andi Jusran Kasim, "Analisis Keakuratan Arah Kiblat Masjid Di Kecamatan Tanete Riattang Barat Kabupaten Bone," *Al-Bayyinah* 3, no. 1 (2019): 93-107, <https://doi.org/10.35673/al-bayyinah.v3i1.319>.

Arifin were key figures in the establishment of the Muhammadiyah Sharia Faculty. Subsequently, efforts were made to nationalize the Muhammadiyah Sharia Faculty, which seemed to coincide with efforts to establish IAIN in Jambi, now known as UIN Sultan Thaha Saifuddin.

At that time, the initial plan was to merge the Muhammadiyah Sharia Faculty into the Raden Patah IAIN in Palembang. There was also a discussion to integrate it into the Imam Bonjol IAIN in Padang. However, the Jambi Level I Regional Government and the Kerinci community wanted the Muhammadiyah Sharia Faculty to be incorporated into the IAIN in Jambi, which was in the process of being established at that time. Therefore, it was proposed that the Muhammadiyah Sharia Faculty be part of the Sultan Thaha Saifuddin State Islamic Institute (IAIN) in Jambi, together with the Sharia Faculty of Al-Hikmah YPI Jambi College and the Tarbiyah and Ushuluddin Faculty of the Al-Ma'arif Jambi College Foundation.⁴⁸

On July 27, 1997, the Minister of Religious Affairs issued a decree on the establishment of IAIN Sultan Thaha Saifuddin. However, after all requirements were met, the Muhammadiyah Sharia Faculty was not included in the decree, which was only discovered during the inauguration ceremony of IAIN Jambi by the Minister of Religious Affairs. After the event, Daud Qahiri and his colleagues held a meeting with the Head of the Higher Education Bureau of the Indonesian Ministry of Religious Affairs, who agreed to immediately make the Muhammadiyah Sharia Faculty a state institution. Decree of the Indonesian Minister of Religious Affairs No. 116 of 1967 changed the status of the Muhammadiyah Sharia Faculty to the Sharia Faculty of IAIN Sultan Thaha Saifuddin, Kerinci branch.⁴⁹

Referring to regulations consisting of Law No. 2 of 1989, Government Regulation No. 30 of 1990, and the Minister of Education and Culture Decree No. 0686/U/1991 concerning Guidelines for the Establishment of Higher Education Institutions, it was stipulated that higher education institutions must be located in one place and were not allowed to have two similar faculties in one institution. Amidst confusion and concerns regarding this policy, Presidential Decree No. 11 of 1997 regarding the establishment of STAIN in Indonesia was issued. Subsequently, the Minister of Religious Affairs inaugurated the establishment of STAINs throughout Indonesia, including STAIN Kerinci. Then, in 2016, based on Presidential Regulation No. 74 of 2016, STAIN Kerinci officially transformed into IAIN Kerinci.⁵⁰

The vision and mission of IAIN Kerinci is to conduct research and development that combines Islamic values, science, culture, arts, and character.⁵¹ Then, it conducts community service based on research and collaborates at the local, national, regional, and international levels.⁵²

Method for Determining the Qibla Direction for the Prayer Room at Campus One of the State Islamic Institute of Kerinci

The Mushola at Campus 1, IAIN Kerinci, is located on Jln. Pelita IV Sungai Penuh. To formulate the history of the establishment of the Mushola at Campus 1, IAIN Kerinci, the author used interviews and documentation. Based on the results of interviews conducted with Syarifudin

⁴⁸ STAIN Kerinci, *Buku Pedoman Sekolah Tinggi Agama Islam Negeri Kerinci* (Kerinci: STAIN Kerinci, 2001).

⁴⁹ STAIN Kerinci, *Buku Pedoman Sekolah Tinggi Agama Islam Negeri Kerinci*.

⁵⁰ Kementerian Agama, "Alih Status IAIN Kerinci Segera Diresmikan," 2018, <https://kemenag.go.id/nasional/alih-status-iain-kerinci-segera-diresmikan-c79516>.

⁵¹ IAIN Kerinci, "VISI - MISI - TUJUAN," n.d., <https://iainkerinci.ac.id/id/read/18/VISI-MISI-TUJUAN>.

⁵² STAIN Kerinci, *Buku Pedoman Sekolah Tinggi Agama Islam Negeri Kerinci*.

Ramli, Head of the General Affairs Division of the Sharia Faculty of IAIN Sultan Thaha Saifuddin Kerinci Branch and treasurer during the construction of the Campus 1 IAIN Kerinci Mushola, as well as the 2001 IAIN Kerinci State Islamic College Guidelines Book. The author then concludes the history of the establishment of the IAIN Kerinci Campus 1 Mushola.

The IAIN Kerinci Campus 1 Mushola was built during the time of the IAIN Sultan Thaha Saifuddin Kerinci Branch Sharia Faculty with Ismail Thaliby as dean. Ismail Thaliby served from July 15, 1991, to June 25, 1995, as stated by Syarifudin Ramli:

“The Mushola was built during Ismail Thaliby’s tenure.”

Combining this information with the Handbook, it can be concluded that the Campus 1 Mushola of IAIN Kerinci was built in 1993. Syarifudin Ramli added:

“Before the Mushola existed, lecturers and students prayed in their respective rooms or at the nearest Mushola, and the construction funds were based solely on self-help, not the state budget, such as one person providing cement and another providing money.”

So, before the mushola was built, lecturers and students performed prayers in their respective rooms or at the nearest mushola. Meanwhile, the funds for the Mushola’s construction came from voluntary contributions. Syarifudin Ramli also said:

“The direction of the qibla was determined with the help of an astronomy lecturer named Ermawati Taher, and the head of the construction was Zufran Rahman, who is also a lecturer.”

From what Syarifudin Ramli said, it can be concluded that in the process of building the Campus 1 IAIN Kerinci Mushola, Zufran Rahman was appointed as the head of the mushola construction. Zufran Rahman was one of the lecturers at that time. Meanwhile, in determining the direction of the qibla for the Campus 1 IAIN Kerinci Mushola, assistance was sought from a lecturer who taught astronomy at that time, namely Ermawati Taher. Ermawati Taher is an alumnus of IAIN Imam Bonjol Padang with a major in Sharia. Furthermore, Syarifuddin Ramli said:

“No tools were used to determine the direction of the qibla. Yes, because at that time there were no advanced tools like you have now. In the past, people could determine the direction of the qibla with a razor blade placed in water and the direction of the sun.”

From this excerpt, it can be concluded that when determining the direction of the qibla for the IAIN Kerinci Campus 1 Mushola, no tools were used because there were no adequate tools or technology available. At that time, people only determined the direction of the qibla by placing a razor blade in water. The direction indicated by the razor blade was considered by the community to indicate the direction of the qibla, or was based on the direction of the sun.

Testing the Accuracy of the Qibla Direction in the Prayer Room at the Campus of the State Islamic Institute of Kerinci Using a Right-Angle Triangle

In testing the accuracy of the qibla direction of the Mushola at IAIN Kerinci Campus 1, the author applied Slamet Hambali’s right-angle triangle method with the aid of a protractor as a tool. The advantage of this method is that it is easy to use. The use of a protractor in determining angles is a simple tool that is easy to find and economical.

To obtain the correct qibla direction of the IAIN Kerinci Campus 1 Mushola, it is necessary to calculate the qibla direction. In performing the calculation, the latitude and longitude data of the Kaaba and the location to be calculated are required. The latitude of the Kaaba is 21° 25' 20.95" and 39° 49' 34.19" for longitude. Meanwhile, the latitude and longitude of the IAIN Kerinci Campus 1 Mushola are obtained from Google Earth coordinates, namely 2° 2' 59" for latitude and 101° 23' 11"

for longitude. After the necessary data has been obtained, the calculation is carried out using the following steps.

$$\begin{aligned}
 \text{Kaaba Latitude } (\varphi_K) &= 21^\circ 25' 20.95'' \\
 \text{Kaaba Longitude } (\lambda_K) &= 39^\circ 49' 34.19'' \\
 \text{Location Latitude } (\varphi_T) &= 2^\circ 2' 59'' \\
 \text{Location Longitude } (\lambda_T) &= 101^\circ 23' 11'' \\
 \lambda_T - \lambda_K &= 101^\circ 23' 11'' - 39^\circ 49' 34.19'' \\
 &= 61^\circ 33' 36.81'' \\
 \text{Cotan K} &= \text{Cos } \varphi_T \cdot \text{Tan } \varphi_K + \text{Sin } \varphi_T \cdot \text{Cos } (\lambda_T - \lambda_K) : \text{Sin } (\lambda_T - \lambda_K) \\
 &= \text{Cos } 2^\circ 2' 59'' \cdot \text{Tan } 21^\circ 25' 20.95'' + \text{Sin } 2^\circ 2' 59'' \cdot \text{Cos } 61^\circ 33' 36.81'' : \text{Sin } 61^\circ \\
 &\quad 33' 36.81'' \\
 &= 0.409130856 : 0.87931818 \\
 K &= \text{Shif Tan } 0.409130856 : 0.87931818 \\
 B - U &= 25^\circ 18' 17.34'' \\
 U - B &= 90^\circ - 25^\circ 18' 17.34'' \\
 &= 64^\circ 41' 42.66'' \\
 \text{UTSB} &= 360^\circ - 64^\circ 41' 42.66'' \\
 &= 295^\circ 18' 17.3''
 \end{aligned}$$

Based on the above calculations, the accuracy of the qibla direction of the Campus 1 IAIN Kerinci Mushola from west to north (B – U) is $25^\circ 18' 17.34''$. Then, the accuracy of the qibla direction of the IAIN Kerinci Campus 1 Mushola from north to west (U – B) is $64^\circ 41' 42.66''$. The accuracy of the UTSB or Kaaba azimuth is calculated from the true north direction on a horizontal circle, following the direction of the clockwise rotation.⁵³ The qibla azimuth of the IAIN Kerinci Campus 1 Mushola is $295^\circ 18' 17.3''$. Based on the results of this qibla direction calculation, the author conducted direct testing and measurement at the mushola. The first thing to do was to find true north and south using a compass, while also determining east and west. A compass is a tool that can be used to identify true north.⁵⁴ However, it needs to be calibrated first by shaking it before use.⁵⁵ Next, the qibla direction was measured using a protractor based on the previous calculations.

The results of the qibla direction measurement of the IAIN Kerinci Campus 1 Mushola showed a significant deviation from the qibla direction of the IAIN Kerinci Campus 1 Mushola before accuracy was determined, and the two were compared. From these measurements, it was found that the qibla direction of the IAIN Kerinci Campus 1 Mushola deviated by 18° from the correct qibla direction. The qibla direction of the IAIN Kerinci Campus 1 Mushola building should be tilted to the right or north with a Kaaba azimuth value of $295^\circ 18' 17.3''$. The deviation of 18° from the correct direction of the qibla exceeds the reasonable deviation limit of 2° .⁵⁶ If a deviation of 1° from the

⁵³ Hastuti and Irfan, "Akurasi Kiblat Kuburan Desa Waetuo Kabupaten Pinrang," *HISABUNA: Jurnal Ilmu Falak* 1, no. 2 (2020): 12–24, <https://doi.org/10.24252/hisabuna.v1i2.14664>.

⁵⁴ Reza Akbar and Riza Afrian Mustaqim, "Theoretical Study of the Use of the Polaris Star As a Reference for the North Point in Determining the Qibla Direction," *Jurnal Ilmiah Islam Futura* 22, no. 1 (2022): 16–28, <https://doi.org/10.22373/jiif.v22i1.9411>.

⁵⁵ Miftahul Jannah Ami and Ifrohati, "Miqat Application in Determining the Qibla Direction of the Mosque," *Nurani: Jurnal Kajian Syari'ah Dan Masyarakat* 22, no. 1 (2022): 121–32, <https://doi.org/10.19109/nurani.v22i1.11798>.

⁵⁶ Izzuddin, "Typology Jihatul Kaabah on Qibla Direction of Mosques in Semarang."

azimuth direction can cause a shift in position of 138.3 km from the Kaaba.⁵⁷ Meanwhile, Dhiauddin Tanjung states that a deviation of 1° causes a shift of 111.219 km.⁵⁸ Therefore, the 18° deviation that occurred at the Campus 1 IAIN Kerinci Mushola is significant and cannot be ignored, because when converted into distance units, the deviation reaches more than 2000 km.

The results of this study also reinforce various previous studies that show the weaknesses of determining the direction of the qibla manually. Research by Alamsyah, Risal, & Rufaida, for example, found that many mosques and prayer rooms experience a deviation of up to 12° from the correct direction of the qibla, with a measured azimuth difference of 342° 37' 03.94".⁵⁹ Similarly, in Dhiauddin Tanjung's research, the average deviation of the qibla direction of mosques/mushallas in Deli Serdang Regency reached 14° 31' 20.51".⁶⁰

These results are also in line with Slamet Hambali's opinion in his book "Ilmu Falak 1" (Astronomy 1), which emphasizes that the right-angled triangle method is a valid and accurate astronomical approach to determining the direction of the qibla. This method provides more precise results than manual approaches, such as relying on the direction of the sunset or simple methods, such as a razor blade in water.⁶¹ Furthermore, inaccurate determination of the direction of the qibla can trigger social conflict.⁶² When the direction of the qibla of a mosque is proven to be deviant and corrected with scientific data, there is often resistance from certain community groups.⁶³

Therefore, there needs to be collective awareness, especially in Islamic educational institutions such as IAIN, to review the qibla direction of places of worship using a scientific approach based on astronomy. This research also provides important input for institutions to equip students, especially those studying astronomy and sharia, with practical skills in verifying the direction of the qibla in the field. This is in line with IAIN's vision as an academic institution that bridges Islamic knowledge, science, and proper worship practices.⁶⁴

In this context, the results of the research not only contribute to science but also serve as an important foundation for designing educational and socialization programs on astronomy for the local community. IAIN Kerinci has a strategic responsibility to expand access to modern astronomical knowledge and apply it practically in the surrounding area. Thus, it can be ensured that all places of worship have a qibla direction that complies with sharia and scientific standards.

Analysis of Findings According to Fiqh

Considering this form of tolerance based on the interpretation of the Qur'anic verse that serves as the legal basis for the obligation to face the qibla in prayer, fiqh scholars, especially Sunni fuqaha, namely Imam Mazhab Hanafi, Maliki, and Hambali, agree that for people outside the haram land, their qibla direction is the haram land. Only the Hanafi school of thought provides specific tolerance

⁵⁷ Saksono, Fulazzaky, and Sari, "Geodetic Analysis of Disputed Accurate Qibla Direction."

⁵⁸ Tanjung, "Deviation of Qicblat Direction at Mosque/Musala in Deli Serdang District, North Sumatra."

⁵⁹ Alamsyah, Risal, and Erti Rospyana Rufaida, "Pendampingan Pengukuran Arah Kiblat Di Musollah Kafe Ruumi Menggunakan Metode Astronomi," *Abdurrauf Journal of Community Service* 1, no. 2 (2024): 71-79, <https://doi.org/10.70742/ajcos.v1i2.57>.

⁶⁰ Tanjung, "Deviation of Qicblat Direction at Mosque/Musala in Deli Serdang District, North Sumatra."

⁶¹ Hambali, *Ilmu Falak 1 Penentuan Awal Shalat & Arah Kiblat Seluruh Dunia*.

⁶² Akbar and Asman, "Social Conflict Due To the Controversy of Mosque's Qibla Direction in Sejiram Village, Sambas Regency."

⁶³ Akbar and Asman.

⁶⁴ Kerinci, "VISI - MISI - TUJUAN."

limits, namely 90° with details of 45° to the right and 45° to the left.⁶⁵ Fiqh, as Sharia law resulting from the efforts of mujtahids from detailed arguments, confirms that the determination of the direction of the qibla has been carried out by scholars since the beginning, referring to the *syatral* argument (the direction of the Masjid al-Haram). Fuqaha who discuss Sharia law from the arguments of the Qur'an and hadith conclude that the qibla for Muslims who are in the Masjid al-Haram is *'ain al-ka'bah*. Meanwhile, the Masjid al-Haram area is the qibla for the people of Mecca. The Islamic community outside the Masjid al-Haram and the haram land, then the haram land area is their qibla direction.

Based on measurements of the direction of the qibla from the Mushola Campus 1 IAIN Kerinci building, it was found that the azimuth of the qibla was tilted to the right or north with a Kaaba azimuth value of $295^\circ 18' 17.3''$. This results in a deviation of 18° from the correct direction of the qibla, which exceeds the acceptable tolerance limit as stated by Indonesian astronomy and astrology expert Ahmad Izzudin in "Typology Jihatul Kaaba on Qibla Direction of Mosques of Semarang" which states that the acceptable deviation limit for the direction of the qibla is 2° from the correct direction.⁶⁶ Meanwhile, according to Anisa Budiwati and Saiful Aziz in "Akurasi Arah Kiblat di Ruang Publik," the tolerance for deviation is $6'$.⁶⁷ There is also Andi Jusran Kasim, who states that there should be no tolerance limit because the qibla direction can be determined with certainty if using the appropriate equipment and sunlight.⁶⁸ From these opinions, the author is more inclined to the opinion that states that the reasonable tolerance limit for the direction of the qibla is 2° . Therefore, the 18° deviation that occurred at the Campus 1 IAIN Kerinci Mushola is significant and cannot be ignored, because when converted into distance units, the deviation reaches more than 2000 km. Therefore, the qibla direction of the Mushola needs to be corrected for the benefit of the residents of Campus 1, IAIN Kerinci, as referred to in the fiqh rule which states "*Maa qaaraba al-syai'a u'thiya hukmuhu*" (whatever is close to something is judged to be the same as that thing).

Conclusion

The method used to determine the qibla direction in the prayer room of the first campus of the State Islamic Institute of Kerinci relies solely on the direction of the sun and does not use modern tools. This is because when the prayer room of the first campus of the State Islamic Institute of Kerinci was built in 1993, adequate tools or technology were not available. The prayer room of the first campus of the State Islamic Institute of Kerinci has a deviation of 18° from the correct qibla direction. This 18° deviation exceeds the allowable tolerance for qibla deviation, which is a maximum of 2° . Therefore, the author recommends recalibrating the qibla direction of the prayer room at the first campus of the State Islamic Institute of Kerinci. This study explains the fiqh of qibla direction and practical methods for determining the qibla calibration in places of worship, which is very important and rare in the field of astronomy, for Muslims to support the benefits of religious practice. This research is limited to analyzing the concept of determining the qibla direction using Slamet Hambali's right-angled triangle theory from a fiqh perspective, thus enabling further research using other astronomical theories and tools.

⁶⁵ Faridah, "Toleransi Arah Kiblat Menurut Mazhab Hanafi Dalam Perspektif Fikih Dan Astronomi."

⁶⁶ Izzuddin, "Typology Jihatul Kaaba on Qibla Direction of Mosques in Semarang."

⁶⁷ Budiwati and Aziz, "Akurasi Arah Kiblat Masjid Di Ruang Publik."

⁶⁸ Kasim, "Analisis Keakuratan Arah Kiblat Masjid Di Kecamatan Tanete Riattang Barat Kabupaten Bone."

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