International Journal of Trends in Mathematics Education Research
Vol. 5, No. 3 (2022), pp. 291~298
ISSN 2621-8488 (online)
DOI: https://doi.org/10.33122/ijtmer.v5i3.123

SAINTIS publishing

Research Article

Designing learning trajectory based on Qur'an and Hadith: A case of fractions at Madrasah Ibtidaiyah

Dewi Rosikhoh[1]✉, Abdussakir[2], Fawad Ali[3] & M Islahul Mukmin[4]

[1] State Islamic Institute of Madura, Indonesia, 69371
[2] Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia, 65144
[3] Institute of Numerical Sciences, Kohat University of Science and Technology, Kohat, Pakistan, 26000
[4] Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia, 65144
✉Corresponding Author: dewirosikhoh@iainmadura.ac.id | Phone Number: +6282244753977

Received: 23 June 2022 *Revised: 13 August 2022* *Accepted: 22 September 2022* *Available online: 30 September 2022*

ABSTRACT

Islamic-based educational institutions needed to internalize Qur'an and hadith in every lesson. Fractions were one of the main subjects of mathematics taught at the elementary school level. The purpose of the study was to design mathematics learning to fractions based on Qur'an and hadith at Madrasah Ibtidaiyah. This study used a qualitative research method with a design research approach of development research type. The results of the study revealed that a learning design could be implemented with a scientific learning approach in fractions learning based on Qur'an and hadith. The verses of the Qur'an and hadith that explicitly mentioned fractional numbers were displayed at the observing stage. Each fractional number in the Qur'an and hadith was illustrated with a length model. Based on the fractional numbers mentioned in the observing stage, students were then directed to submit nutmeg questions in the questioning stage. The questions at the questioning stage were appropriate to the material, then discussed at the reasoning stage while still applying student-centered learning.

Keywords: learning design; fractions; qur'an and hadith-based learning; madrasah ibtidaiyah

1. INTRODUCTION

Integrated learning in schools continues to be expanded. It is key to equip students with a religious character (Moulin-Stożek, 2020), especially for Islamic-based educational institutions. Madrasah is mandated to develop integrated learning with Islam (Abdussakir & Rosimanidar, 2017; Haqiqi & Albar, 2019; Nata & Sofyan, 2020). It also applies to learning mathematics. Al-Qur'an and hadith as sources of Islamic teachings also contain mathematical concepts (Abdussakir, 2014; Hapiz et al., 2019; Laili, 2018; Nasution, 2017; Rosikhoh & Abdussakir, 2020).

Research related to the exploration of mathematical concepts in the Qur'an and hadith has been carried out (Abdussakir, 2014; Hapiz et al., 2019; Laili, 2018; Rosikhoh & Abdussakir, 2020). However, this is not enough to give meaning. It is necessary to develop a learning design based on Qur'an and hadith since internalizing culture and religion into learning makes learning more meaningful (Abdussakir, 2017; Rosikhoh et al., 2021; Sharma & Orey, 2017; Vandeyar, 2017). Thus, it is necessary to implement an integrated learning design so that one can apply learning mathematics based on Qur'an and hadith at school.

Fractions are the principal material in learning mathematics that from an early stage must be mastered. Therefore, at elementary school, fractions are taught (Empson et al., 2011; Steenbrugge et al., 2014). Fractional numbers are mentioned in the Qur'an and hadith explicitly (Abdussakir & Rosimanidar, 2017). Research related to the exploration of fractions in the Qur'an and hadith has also been carried out (Hapiz et al., 2019; Rosikhoh & Abdussakir, 2020). Research related to the implementation of numbers in the Qur'an has also been carried out (Mansur et al., 2018). However, the study is limited to specific integers. Additionally, research related to how to teach fractional number material contained in the Qur'an and hadith is still rare to find. Thus, this study developed a design for fractions learning based on Qur'an and hadith at an Islamic-based elementary school *(Madrasah Ibtidaiyah)*.

2. RESEARCH METHOD

This study used a qualitative research method with a design research approach of development studies type (Putrawangsa, 2018). The first step was to choose math material: fractions at an Islamic-based elementary school (Madrasah Ibtidaiyah).

The second step was to find and identify verses of the Qur'an and hadith that contain fractional numbers. There were many verses of the Qur'an (Hapiz et al., 2019) and hadiths that mentioned fractional numbers (Rosikhoh & Abdussakir, 2020). This study used the surah an-Nisa:12, the hadith Sahih Muslim:1344, Sunan Tirmidhi:2818, and Sunan Abu Daud:86. The third step was to explore fractional numbers in the verses of the Qur'an and hadith so that used in learning. The fourth step was to determine the integration model of the fractional numbers and the results of the exploration of Qur'an's verses and hadiths used. Numbers were one of the mathematical materials mentioned in the Qur'an explicitly. Therefore, fractions could be integrated through the mathematics from the Qur'an model. Additionally, the Qur'an's verses and hadiths related to fiqh material for fractions learning could also use the mathematics for the Qur'an integration model (Abdussakir & Rosimanidar, 2017). The fifth step was to determine the model and learning method used. Next, described fractions learning design based on Qur'an and hadith at *Madrasah Ibtidaiyah.*

3. RESULTS AND DISCUSSION

3.1 Results

Fractions learning based on Qur'an and hadith at Madrasah Ibtidaiyah can be taught with a scientific learning approach. Previous research reported that scientific learning could improve critical thinking skills (Nurcahyo et al., 2018). Additionally, scientific learning was also influential in improving student learning outcomes (In'am & Hajar, 2017),(Firman et al., 2018). The learning stages carried out in this research were: observing, asking, and reasoning. At the observation stage, the verses of the Qur'an and the hadith which explicitly mentions fractional numbers were given. It serves to internalize the material and Islamic values to instill religious character in the students of Madrasah Ibtidaiyah. Additionally, the verses of the Qur'an and hadith could train students' literacy. It is key to improving the literacy skills needed to face the challenges of today's era.

Fractions were explicitly mentioned in the verses of the Qur'an and hadith were then illustrated using a length model (Mccoy et al., 2016; Souza & Powell, 2021). It was intended to make students easier to understand the material of fractions. Fractions learning based on Qur'an and hadith were divided into two sub-materials. First, using hadith to understand the meaning of fractions and how to express them, recognize proper fractions, and understand a fraction a/b with a>1 as the sum of fractions 1/b. Second, using the verses of the Qur'an to understand equivalent fractions.

3.1.1 Fractions Learning Based on Hadith

1) Observing

Observation 1

Read the following hadith and observe each picture in the following hadith.

a. The Prophet said: *"Couldn't any of you recite the thirds of the Qur'an overnight?" They asked in return, "How do you read a third of it?" The Prophet replied "Qul huwallahu ahad" (Surat al-Ikhlash) is equal to thirds of the Qur'an." The Prophet said: "Verily Allah 'azza wajalla made Qur'an into three parts. Then Allah made, "Qul huwallahu ahad" as a part of the parts' Qur'an."* (Hadith Sahih Muslim 1344).

Figure 1. Illustration of one part of the three parts of the Qur'an

b. The Prophet sallallaahu 'alaihi wa sallam said: *"Whoever reads "Idza Zulzilat" it will be replaced for him with half of the Qur'an*,

Figure 2. Illustration of the reward obtained when reading the letter *az-Zalzalah* once

whoever reads "Qul yaa ayyuhal kaafiruun" it will be replaced for him with the fourths of the Qur'an,

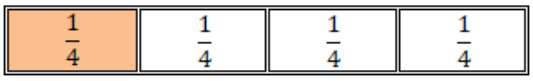

Figure 3. Illustration of the reward obtained when reading Surah *al-Kafirun* once

And whoever reads "Qul huwallaahu ahad" it will be likened to him the thirds of the Qur'an." (Sunan Tirmidhi 2818).

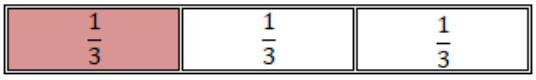

Figure 4. Illustration of the reward obtained when reading Surah al-Ikhlash once

c. *The Prophet sallallaahu 'alaihi wa sallam performed ablution, he was given a vessel filled with water about two-thirds of the mud.* (Sunan Abu Dawud 86).

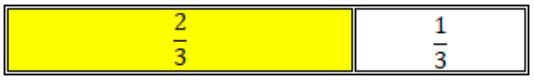

Figure 5. Illustration of the amount of water the Prophet used when performing ablution

2) Asking

Ask examples of questions related to fractions according to the text of the hadith given. For example: "How do you write a fraction?" "Why are thirds written 1/3?" Allow students to ask or record questions related to fractions.

3) Reasoning

a) Understanding Fractions and How to Express Fractions

Note Observation 1. Based on the hadith Sahih Muslim 1344, at first, Qur'an was stated as a single unit. Then, Qur'an is divided into three equal parts (see Figure 6). It shows that this hadith contains the part-whole meaning: stating fractions as a part of the whole (Čadež & Kolar, 2018; Jiang et al., 2021; Norton et al., 2014). Part-whole meaning of fractions is the most popular fraction meaning (Jones, 2012).

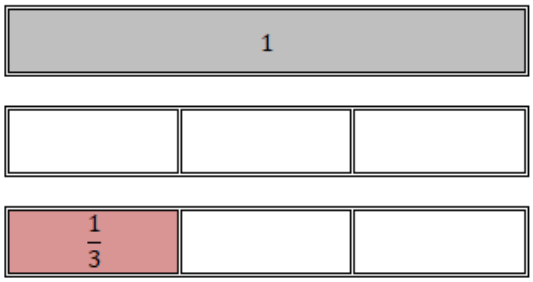

Figure 6. Part-whole meaning of fractions

a. If you read "*Qul huwallahu ahad*" (Surah *al-Ikhlash*) once, this is the same as reading 1 part of 3 parts of the Qur'an (see Figure 1). Furthermore, 1 part of 3 parts is expressed as thirds and can be written as *1/3*.
b. If you read "*Qul huwallahu ahad*" (Surah *al-Ikhlash*) twice, this is the same as reading how many parts of the Qur'an?

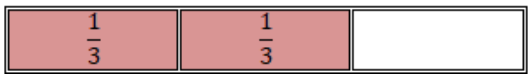

Figure 7. Illustration of the reward obtained when reading Surah *al-Ikhlash* twice

Thus, 2 parts of 3 parts are expressed as two-thirds and can be written as *2/3*.

c. If you read "*Qul huwallahu ahad*" (Surah *al-Ikhlash*) three times, this is the same as reading how many parts of the Qur'an?

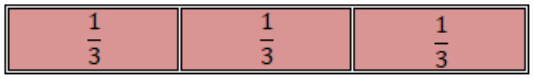

Figure 8. Illustration of the reward obtained when reading Surah *al-Ikhlash* three times

Thus, 3 parts of 3 parts are expressed as three-thirds and can be written as *3/3*.

b) Understanding Proper Fractions

Fractions are numbers that are denoted by a/b. where a and b are integers and $b \neq 0$. a is called the numerator, and b is called the denominator. Then, pay attention to fractions contained in Observation 1, compare the numerator and denominator. Fractions in **Table 1** are proper fractions. Furthermore, the teacher can direct students to make their conclusions which regard the meaning of proper fractions. If a/b denote a fraction where a and b are integers and $b \neq 0$, then a fraction is called proper fractions if the numerator is smaller than the denominator (Gabriel et al., 2013; Newton et al., 2014; Nurasiyah & Ruqoyyah, 2018).

Table 1. Identification of proper fractions

Fractions	Numerator	Denominator	Comparison between numerator and denominator
1/3	1	3	1 < 3
1/2	1	2	1 < 2
1/4	1	4	1 < 4
2/3	2	3	2 < 3
a/b	…	…	… < …

c) Understanding a Fraction a/b with a >1 as the Sum of Fractions 1/b
Look again at the illustration of fractions in Observations 1a (*1/3*) and 1c (*2/3*).

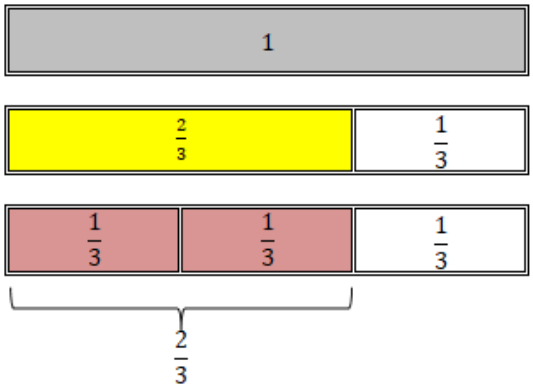

Figure 9. Two-thirds is the sum of thirds and thirds

Based on **Figure 9** then,

$$\frac{2}{3} = \frac{1}{3} + \frac{1}{3} \quad (1)$$

Look again at the illustration of fractions in Figure 1 and Figure 5. If someone reads "*Idza zulzilat*" (Surah *az-Zalzalah*) once, this is the same as reading half (*1/2*) of the Qur'an. If someone reads "*Qul yaa ayyuhal kaafiruun*" (surah *al-Kafirun*) once, this is equivalent to reading a quarter (*1/4*) of the Qur'an. If someone reads "*Qul yaa ayyuhal kaafiruun*" (Surah *al-Kafirun*) twice, this is the same as reading two quarters (*2/3*) of the Qur'an.

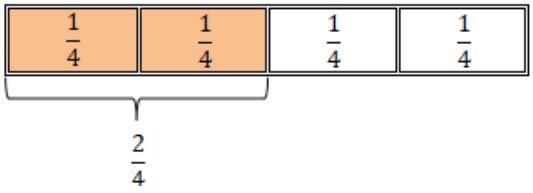

Figure 10. Two quarters is the sum of fourths and fourths

Based on Figure 10 then,

$$\frac{2}{4} = \frac{1}{4} + \frac{1}{4} \quad (2)$$

Look at **Figure 11.**

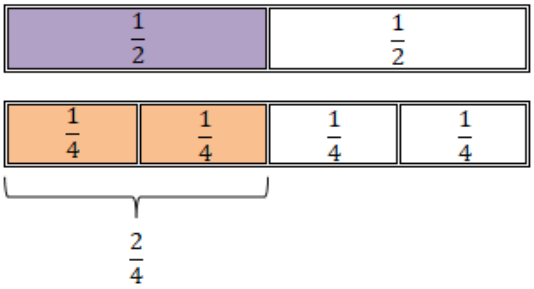

Figure 11. Equivalence of a half and two quarters

Based on **Figure 11** then,

$$\frac{1}{2} = \frac{2}{4} \quad (3)$$

Thus, *1/2* equal to *2/4*. This shows that reading "*Idza zulzilat*" (Surah *az-Zalzalah*) once has the same value as reading "*Qul yaa ayyuhal kaafiruun*" (Surah *al-Kafirun*) twice.

3.1.2 Fractions Learning Based on Qur'an

1) Observing

Observation 2

Read Surah *an-Nisa* verse 12 regarding the distribution of the following inheritance, and observe each picture in the following verse.

a. "*And for you (husbands), one-half of the property is left by your wives if they do not have children*."

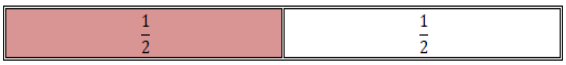

Figure 12. Illustration of husband's inheritance rights left by his wife, if they don't have children

b. "*If your wives have children, then you will get a quarter of the property left by them after their will has been fulfilled or (and) after the debt has been paid*."

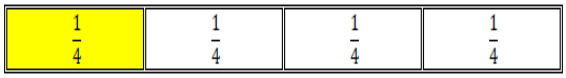

Figure 13. Illustration of husband's inheritance rights left by his wife, if they have children

c. "*If you have children, then the wives get one-eighth of the property you left after fulfilling your will or (and) after paying your debts*."

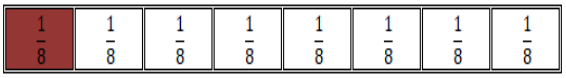

Figure 14. Illustration of wife's inheritance rights left by her husband, if they have children

d. "*If a person dies, both male and female, who does not leave his father and does not leave children, but has a brother (one mother only) or a sister (only one mother), then the share of each of the two types of brothers is one-sixth of the property,*"

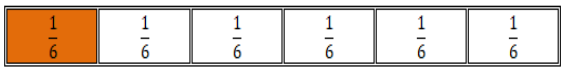

Figure 15. Illustration of the inheritance rights of a brother of one mother or one sister of one mother who was left by his/her brother/sister, if the deceased did not have a father or child

e. "*But if the mother's brothers are more than one, then they are partners in the third one, after fulfilling the will made by him or after paying the debt by not giving harm (to the heirs)*."

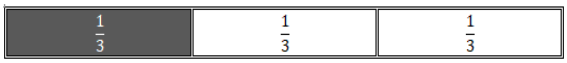

Figure 16. Illustration of inheritance rights of more than one brother of one mother, or more than one sister of one mother who is left by his/her brother/sister, if the deceased does not have a father or child

2) Asking

Ask questions related to fractions according to the text of the hadith given. For example: "Are there any fractions that are the same in Surah an-Nisa verse 12?" "Does it mean that two fractions have the same value?" Allow students to ask or record questions related to equivalent fractions.

3) Reasoning

d) Identifying Equivalent Fractions

Look again at the fraction illustration in Observation 2.

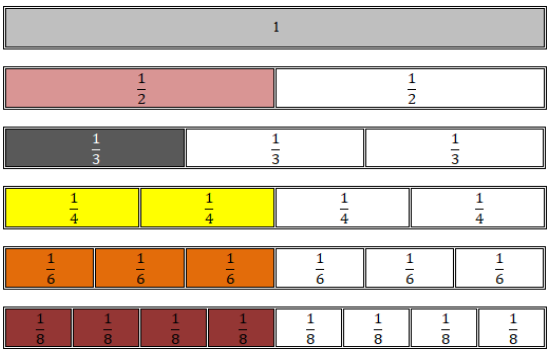

Figure 17. Fraction strips

Based on Figure 17, *1/2* and *2/4* are on a vertical line. Additionally,

$$\frac{1}{4}+\frac{1}{4}=2\times\frac{1}{4}=\frac{2}{4} \quad (4)$$

$$\frac{2}{4}\div\frac{2}{2}=\frac{2\div2}{4\div2}=\frac{1}{2} \quad (5)$$

$$\frac{1}{2}\times\frac{2}{2}=\frac{1\times2}{2\times2}=\frac{2}{4} \quad (6)$$

Based on Equation (5) and Equation (6) then,

$$\frac{1}{2}=\frac{2}{4} \quad (7)$$

Thus based on Equation (7) then, half and two quarters are equivalent fractions [26,30,31]. Furthermore, find other fractions equal to *1/2*. Find a fraction equal to *1/3*. Find a fraction equal to *2/3*. Find a fraction equal to 3/4.

3.2 Discussion

Fractions learning design based on Qur'an and hadith mentioned above fulfills in the contextual learning category. It was because the hadith and Qur'an were very close to the lives of Madrasah Ibtidaiyah students. Contextual learning could improve critical thinking skills and increase self-confidence (Surya et al., 2017). Contextual learning could support the progress of students' mathematical thinking, too (Widjaja, 2013). The learning design above was also student-centered. This was indicated by the using scientific learning approach. Previous research reported that students were active in learning with a scientific learning approach (In'am & Hajar, 2017). The scientific learning approach could also improve students' critical thinking skills (Nurcahyo et al., 2018). Additionally, scientific learning could also improve student learning outcomes (Firman et al., 2018). At the reasoning stage, students were directed to find a concept. It showed that students were educated or trained to conduct guided discovery learning (Afriza et al., 2018). The reasoning phase is implicitly showed students' activities to gather information and make the association. The communicating stage could be done by presenting or reading the results of the works at the reasoning stage. Additionally, this learning design could be used in cooperative learning (Baloche & Brody, 2017). Thus, fractions learning design based on Qur'an and hadith was following the demands of the current curriculum.

4. CONCLUSION

Based on the results and discussion can be concluded that fractions learning design based on Qur'an and hadith can be made at Madrasah Ibtidaiyah. The learning design is made using a scientific learning approach with three stages: observing, asking, and reasoning. However, at the reasoning stage, it implicitly includes information gathering and association activities. This fraction learning design uses a length model to illustrate fractions that are mentioned in the verses of the Qur'an and hadith explicitly. Hadith-based fractions learning can teach the meaning of fractions and how to express them, recognize proper fractions and understand a fraction a/b with a>1 as the sum of fractions 1/b. Qur'an-based fractions learning is used to teach equivalent fractions.

AUTHOR'S CONTRIBUTIONS

The authors discussed the results and contributed to from the start to final manuscript.

CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

REFERENCES

Abdussakir. (2014). Matematika dalam al-Quran. UIN-Maliki Press. http://repository.uin-malang.ac.id/2737/7/2737.pdf

Abdussakir. (2017). Internalisasi nilai-nilai islami dalam pembelajaran matematika dengan strategi analogi. A Seminar Nasional Integrasi Matematika Dan Nilai Islami, 1(1), 1–15. http://conferences.uin-malang.ac.id/index.php/SIMANIS/article/view/546

Abdussakir, & Rosimanidar. (2017). Model integrasi matematika dan al-quran serta praktik pembelajarannya. *Seminar Nasional Integrasi Matematika di Dalam Al-Quran*, 1–16. http://repository.uin-malang.ac.id/1934/

Afriza, Y. Y., Hutapea, N. M., & Armis, A. (2018). Pengembangan perangkat pembelajaran matematika berbasis model discovery learning pada materi barisan bilangan di kelas VIII SMP. *JOM FKIP*, 5(1), 1–12. https://jom.unri.ac.id/index.php/JOMFKIP/article/view/19732

Baloche, L., & Brody, C. M. (2017). Cooperative learning: exploring challenges, crafting innovations. *Journal of Education for Teaching, 43*(3), 274–283. https://doi.org/10.1080/02607476.2017.1319513

Bouck, E. C., Bassette, L., Shurr, J., Park, J., Kerr, J., & Whorley, A. (2017). Teaching Equivalent Fractions to Secondary Students With Disabilities via the Virtual–Representational–Abstract Instructional Sequence. *Journal of Special Education Technology, 32*(4), 220–231. https://doi.org/https://doi.org/10.1177%2F0162643417727291

Čadež, T. H., & Kolar, V. M. (2018). How fifth-grade pupils reason about fractions: a reliance on part-whole subconstructs. *Educational Studies in Mathematics, 99*(3), 335–357. https://doi.org/10.1007/s10649-018-9838-z

Empson, S. B., Levi, L., & Carpenter, T. P. (2011). The Algebraic Nature of Fractions: Developing Relational Thinking in Elementary School. *In Early Algebraization, 1*, 409–428. https://doi.org/10.1007/978-3-642-17735-4_22

Firman, Baedhowi, & Murtini, W. (2018). The Effectiveness of The Scientific Approach to Improve Student Learning Outcomes. *International Journal of Active Learning, 3*(2), 86–91. http://journal.unnes.ac.id/nju/index.php/ijal

Fitzsimmons, C. J., Thompson, C. A., & Sidney, P. G. (2020). Do adults treat equivalent fractions equally? Adults' strategies and errors during fraction reasoning. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 46*(11), 2049–2074. https://doi.org/https://psycnet.apa.org/doi/10.1037/xlm0000839

Gabriel, F., Coché, F., Szucs, D., Carette, V., Rey, B., & Content, A. (2013). A componential view of children's difficulties in learning fractions. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2013.00715

Hapiz, A., Annisa, H., & Rofiki, I. (2019). Bilangan pecahan dalam al-quran dan hadits. 5(1).

Haqiqi, A. K., & Albar, W. F. (2019). Islamic Character in Science Learning for Madrasah Ibtidaiyah Students in the 4.0 Industrial Revolution Era. *Proceeding International Conference on Science and Engineering, 2*, 237–240. https://doi.org/10.14421/icse.v2.93

In'am, A., & Hajar, S. (2017). Learning Geometry through Discovery Learning Using a Scientific Approach. *International Journal of Instruction, 10*(1), 55–70. https://doi.org/http://dx.doi.org/10.18415/ijmmu.v5i3.234

Jiang, Z., Mok, I. A. C., & Li, J. (2021). Chinese Students' Hierarchical Understanding of Part-whole and Measure Subconstructs. *International Journal of Science and Mathematics Education, 19*(7), 1441–1461. https://doi.org/10.1007/s10763-020-10118-1

Jones, J. C. (2012). Visualizing elementary and middle school mathematics methods. John Wiley & Sons, Inc.

Laili, A. F. N. (2018). Teori Himpunan dalam Ayat-ayat al-Qur'an. 46, 1–11.

Mansur, M., Helsa, Y., & Kenedi, A. K. (2018). Al-Quran Based Learning Strategy in Teaching Mathematics at Primary Education. *Proceedings of the International Conference of Early Childhood Education (ICECE), 169*(Icece 2017), 304–306. https://doi.org/10.2991/icece-17.2018.78

Mccoy, A., Barnett, J., & Stine, T. (2016). Paper Plate Fractions: The Counting Connection. The Mathematics Teacher, 23(4), 244–251. https://doi.org/https://doi.org/10.5951/teacchilmath.23.4.0244

Moulin-Stożek, D. (2020). Spiritual Development as an Educational Goal. *ECNU Review of Education, 3*(3), 504–518. https://doi.org/10.1177/2096531120935128

Nasution, A. (2017). Implementasi konsep matematika dalam al-Qur'an pada kurikulum madrasah. *EduTech: Jurnal Ilmu Pendidikan Dan Ilmu Sosial, 3*(1). http://jurnal.umsu.ac.id/index.php/edutech/article/view/983

Nata, A., & Sofyan, A. (2020). Making Islamic University and Madrasah as Society's Primary Choice. *Al-Hayat: Journal of Islamic Education, 4*(2), 210–222. https://doi.org/https://doi.org/10.35723/ajie.v4i2.150

Newton, K. J., Willard, C., & Teufel, C. (2014). An examination of the ways that students with learning disabilities solve fraction computation problems. *Elementary School Journal,* 1(15), 1–21. https://doi.org/10.1086/676949

Norton, A., Wilkins, J. L. M., Evans, M. A., Deater-deckard, K., Balci, O., & Chang, M. (2014). Technology Helps Students Transcend Part-Whole Concepts. M*athematics Teaching in the Middle School, 19*(6), 352–358. https://doi.org/https://doi.org/10.5951/mathteacmiddscho.19.6.0352

Nurasiyah, N., & Ruqoyyah, S. (2018). Improving Mathematics Learning Outcomes In Simple. 01(05), 231–242.

Nurcahyo, E., S, L. A., & Djono. (2018). The Living History Approach to Improve the Empathy in Historical Learning. *International Journal of Multicultural and Multireligious Understanding, 5*(3), 72–80. https://doi.org/http://dx.doi.org/10.18415/ijmmu.v5i3.234

Putrawangsa, S. (2018). Desain pembelajaran: Design research sebagai pendekatan desain pembelajaran (1st ed.). CV. Reka Karya Amerta.

Rosikhoh, D., & Abdussakir. (2020). Bilangan pecahan dan operasinya dalam hadits. JMPM: *Jurnal Matematika Dan Pendidikan Matematika, 5*(1), 44–53. https://doi.org/https://doi.org/10.26594/jmpm.v5i1.1800

Rosikhoh, D., Abdussakir, A., & Harini, S. (2021). Pengembangan modul pembelajaran segitiga berbasis metakognisi dan integrasi. *Jurnal Analisa, 7*(1), 99–111. https://doi.org/10.15575/ja.v7i1.12104

Sharma, T., & Orey, D. C. (2017). Meaningful Mathematics Through the Use of Cultural Artifacts. In Ethnomathematics and Its *Diverse Approaches for Mathematics Education*, 153–179. https://doi.org/10.1007/978-3-319-59220-6_7

Souza, M. A. V. F. de, & Powell, A. B. (2021). How do textbooks from Brazil, the United States, and Japan deal with fractions? Acta Scientiae, 23(4), 77–111. https://doi.org/10.17648/acta.scientiae.6413

Steenbrugge, V. H., Lesage, E., Valcke, & Desoete, A. (2014). Preservice elementary school teachers' knowledge of fractions: A mirror of students' knowledge? *Journal of Curriculum Studies, 46*(1), 138–161. https://doi.org/10.1080/00220272.2013.839003

Surya, E., Putri, F. A., & Mukhtar. (2017). Improving mathematical problem-solving ability and self-confidence of high school students through contextual learning model. *Journal on Mathematics Education, 8*(1), 85–94. https://doi.org/10.22342/jme.8.1.3324.85-94

Vandeyar, S. (2017). The teacher as an agent of meaningful educational change. Kuram ve Uygulamada Egitim Bilimleri, 17(2), 373–393. https://doi.org/10.12738/estp.2017.2.0314

Widjaja, W. (2013). The use of contextual problems to support mathematical learning. *Journal on Mathematics Education, 4*(2), 151–159. https://doi.org/10.22342/jme.4.2.413.151-159