دار نشر جامعة قطر
Qatar University Press

مركز ابن خلدون للعلوم الإنسانية والاجتماعية
Ibn Khaldon Center for Humanities and Social Sciences

OPEN ACCESS
Submitted: 12 April 2023
Accepted: 27 August 2023

Research Article

Qurʾānic Studies and Natural Sciences :A Methodological Interdisciplinary Approach and its Intellectual Gains*

Ghasem Darzi

Assistant Professor, Interdisciplinary Quranic, Interdisciplinary Studies Research Institute, Shahid Beheshti University, Iran

gh_darzi@sbu.ac.ir

Abstract

The interdisciplinary relationship between Qurʾānic studies and natural sciences has a long history, but it has always been challenging due to the significant differences in epistemology, language, and methodology. These fundamental differences make interdisciplinary research between these two paradigms complicated. A methodological approach to the most important types of relations between these two paradigms can make this complex path smoother and reduce the epistemological errors of research. In this study, we will first explore the concept of methodological interdisciplinarity by examining the theoretical literature produced by experts in interdisciplinary studies. Next, using a descriptive-analytical method, we will examine the most significant interdisciplinary research in the field of Qurʾānic studies and natural sciences. By categorizing and ranking these studies, we will identify and introduce three intellectual achievements–methodological interdisciplinarity aims to improve the quality of results by borrowing methods or concepts from other disciplines to test hypotheses, answer research questions, or develop theories. Based on the degrees of integration and the relation between Qurʾānic studies and natural sciences, the following three main achievements can be listed: First, developing theological insights for the Qurʾān. Secondly, generating exegetical insights for Qurʾānic commentators. Thirdly, generating new perspectives in natural sciences. In this way, the main achievement of interdisciplinary integration belongs to Qurʾānic studies in the first two types, while the third type generates new perspectives in natural sciences.

Keywords: Qurʾānic Studies; Natural Sciences; Interdisciplinarity; Integration; Achievements

Cite this article as: Darzi, Ghasem. "Qurʾānic Studies and Natural Sciences: A Methodological Interdisciplinary Approach and its Intellectual Gains." *Tajseer Journal*, Vol. 5, Issue 2 (2023).

https://doi.org/10.29117/tis.2023.0144

* Submitted for: The Annual Conference of Ibn Khaldon Center on Interdisciplinary Research (September 30th- October 1st, 2023).

دار نشر جامعة قطر
Qatar University Press

مركز ابن خلدون للعلوم الإنسانية والاجتماعية
Ibn Khaldon Center for Humanities and Social Sciences

OPEN ACCESS

تاريخ الاستلام: 12 ابريل 2023
تاريخ القبول: 27 أغسطس 2023

مقالة بحثية

الدراسات القرآنية والعلوم الطبيعية: نهج المقاربة البينية ومكتسباته الفكرية*

قاسم درزي

أستاذ مساعد، معهد بحوث الدراسات القرآنية المتعددة التخصصات، جامعة شهيد بهشتي، إيران

gh_darzi@sbu.ac.ir

ملخص

تتميز العلاقة البينية بين دراسات القرآن والعلوم الطبيعية بتاريخ طويل، ولكن ما ظل يحمله هذان الحقلان من تحديات بسبب الاختلافات الجدرية المتضمنة فيها من حيث؛ المنهجية، واللغة، والأسس المعرفية، هي ما جعل البحث البيني بين هذين الحقلين معقدًا جدا. إلا أننا نفترض أن اعتماد مقاربة منهجية لأهم أنواع العلاقات بين هذين الحقلين يمكن أن يجعل هذا البحث أيسر وأقل عرضة للأخطاء المعرفية. وعليه، نعمل في هذا البحث أولًا على كشف مفهوم التعددية المنهجية من خلال دراسة الأدبيات النظرية التي أنتجها خبراء في الدراسات البينية. ونقوم ثانيًا بدراسة أهم الأبحاث البينية في مجال دراسات القرآن والعلوم الطبيعية، من خلال تصنيف وترتيب الدراسات المعتمدة فيها باستخدام نهج وصفي تحليلي. كما نعمل ثالثًا على تحديد ثلاثة إنجازات فكرية بحسب درجات التكامل والعلاقة بين دراسات القرآن والعلوم الطبيعية، بهدف بيان دور المنهجية البينية في تحسين جودة النتائج المتوصل إليها، سواء من خلال استعارة أساليب، أو مفاهيم من تخصصات أخرى لاختبار الفرضيات، أو الإجابة عن أسئلة البحث، أو تطوير النظريات. ويمكن تصنيف الإنجازات الثلاثة الرئيسة كما يلي: أولًا، تطوير الرؤى اللاهوتية للقرآن. ثانيًا، توليد الرؤى التفسيرية لمفسري القرآن. ثالثًا، توليد وجهات نظر جديدة في العلوم الطبيعية. وبهذه الطريقة، يعود الإنجاز الرئيسي في التكامل البيني إلى دراسات القرآن في النوعين الأولين، في حين يولد النوع الثالث وجهات نظر جديدة في العلوم الطبيعية.

الكلمات المفتاحية: الدراسات القرآنية؛ العلوم الطبيعية؛ البينية؛ التكامل؛ الإنجازات

للاقتباس: درزي، قاسم. "الدراسات القرآنية والعلوم الطبيعية: نهج المقاربة البينية ومكتسباته الفكرية"، **مجلة تجسير**، المجلد الخامس، العدد 2 (2023)

https://doi.org/10.29117/tis.2023.0144

* قُدم في: مؤتمر مركز ابن خلدون السنوي للتجسير (30 سبتمبر - 1 أكتوبر 2023).

Introduction

Natural science is a branch of empirical sciences that seeks to explain and predict natural phenomena. It encompasses disciplines such as biology, chemistry, geology, astronomy, and physics, which study the objects, phenomena, and laws of nature and the physical world. Natural sciences focus on the study of the universe in parts and employ scientific methods to investigate natural events.[1] Natural Sciences are defined as disciplines that deal only with natural events (i.e., independent and dependent variables in nature) using scientific methods.[2] There are five branches of natural sciences[3]; including: 1. Astronomy 2. Biology 3. Chemistry 4. Earth sciences 5. Physics[4].

The Quran is also a book that covers a wide range of topics, including natural sciences such as cosmology, biology, chemistry, earth sciences, and physics.

Scholars such as Mehdi Golshani have attempted to highlight the importance of natural sciences in the Qurʾān from a philosophical perspective. It is evident that this book is dominated by a prominent philosophical approach, which is why there are limited and few Qur'anic evidences of natural sciences included. Mohammad Iqbal is another scholar who has tried to "Reconstruct Muslim religious philosophy with due regard to the philosophical traditions of Islam and the more recent developments in the various domains of human knowledge" using scientific and experimental methods[5]. Although he has also been able to use experimental sciences well in reconstructing the topics of Islamic philosophy, his focus on philosophy has caused significant textual evidence, especially the Qurʾān, to be found in this work.

In contrast, Zakir Naik's book "The Quran & Modern Science: Compatible or Incompatible?",[6] presents numerous examples of comparing scientific theories with Qurʾānic verses. Contrary to Golshani[6] who had a philosophical approach to the relationship between the Qurʾān and science, Naik's work shows numerous examples of comparing scientific theories with the verses of the Qurʾān. Naik's work provides simplistic and superficial comparisons between scientific theories and Quranic verses. For instance, he compares the creation of the world with the Big Bang theory and claims that the Qurʾān explicitly addresses this story in verse[7] 21:30.

---

1 - Kassim Olusanmi Ajayi, T. Solarin, & Abisila O. Lawani, "Speaking mathematically: The role of language and communication in teaching and learning of mathematics", In Nawachukwu Price Ololube, Peter James Kpolovie, Lazarus Ndiku Makewa, *Handbook of research on enhancing teacher education with advanced instructional technologies* (U. S.A: IGI Global, 2015).

2 - Stephen F. Ledoux, "Defining natural sciences" *Behavior Today*, Vol. 5, No. 1 (Spring 2002), p. 34.

3 - Stephen M. Barr, *A student's guide to natural science* (Delaware: Intercollegiate Studies Institute, 2006), p. 1.

4 - Rongxing Guo, "Studying borders, evaluating border effects". In R. Q. Grafton, D. Shaw, & T. Kompas, *Cross-Border Resource Management* (U.K: Edward Elgar Publishing, 3rd ed., 2018), p. 69.

5 - Muhammad Iqbal, *the Reconstruction of Religious Thought in Islam* (Pakistan: Iqbal Academy, 1930).

6 - Zakir Naik, *The Qur'an & Modern Science: Compatible or Incompatible?* (Islamic Research Foundation, AHYA Multi-Media, 2022). http://www.islamguiden.com/arkiv/quran_science.pdf

7 - Mehdi Golshani, "The Holy Quran and the Sciences of Nature", Islamic Propagation Organization, Accessed August 23,

However, such comparisons lack depth and fail to respond to interdisciplinary research issues. The book mainly adopts a philosophical approach, resulting in a scarcity of Qurʾānic evidence related to natural sciences. Kamal Hassan and his colleagues' three-volume work comprehensively compares scientific verses of the Qurʾān from the perspective of empirical sciences. First, a coherent classification of experimental sciences is presented here, then various scientific topics are raised separately in each chapter and the Qurʾān's point of view is expressed in relation to them. While the book makes numerous comparisons between scientific theories and Qurʾānic verses, the depth of these discussions may not be sufficient for the intended audience of high school students.

These are few works whose main theme was Qurʾān and experimental sciences and they tried to present a general view related to Quran and science. The main problems and defects that can be seen in these works are: superficial and non-deep comparisons; not responding to the issues of disciplines involved in interdisciplinary research, and not being problem-oriented.

This research aims to examine the types of connections between the Qurʾān and experimental sciences from an interdisciplinary perspective. The study focuses on three main types of connections and aims to address the problems and defects observed in previous works, such as superficial comparisons and a lack of response to interdisciplinary research issues. This research is unique in its methodological approach to interdisciplinary studies of the Qurʾān and experimental sciences.

1. Integration and Interdisciplinarity

Integration refers to the establishment of a stable connection between various disciplines, and it is the most crucial aspect of interdisciplinary studies evident in the theories of numerous interdisciplinary scholars. Klein[7] defines this concept as a process of achieving integrative synthesis, which often commences with a problem, topic, or issue. Researchers must work towards overcoming the challenges that arise from differences in language and disciplinary perspectives.

Here, she considers overcoming the linguistic and ontological differences of the researcher to be the main task of the interdisciplinary researcher.

Klein and Newell[8] add much more details to this definition:

> *Interdisciplinary studies are defined as a process of answering a question, solving a problem, or addressing a topic that is too broad or*

2022, p. 9. https://www.al-islam.org/holy-quran-and-sciences-nature-mehdi-golshani.

8 - Julie Thompson Klein, Interdisciplinarity: *History, Theory and Practice* (Deteroit: Wayne State University Press, 1990), p. 188.

> *complex to be dealt with adequately by a single discipline or profession. Whether the context is an integrated approach to general education, a women's studies program, or a science, technology, and society program, IDS draws on disciplinary perspectives and integrates their insights through construction of a more comprehensive perspective.*[9]

In this definition, firstly, "complexity" is introduced as a distinguishing feature of interdisciplinary issues and topics from others, secondly, different parts of the interdisciplinary process are included in the definition: Identifying an interdisciplinary issue or problem, extracting disciplinary insights, integrating insights, and creating comprehensive perspective. The National Academy of Sciences[9] has emphasized that a proper interdisciplinary approach is aligned with the integration and combination of disciplinary ideas and methods:

> *Interdisciplinary research (IDR) is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or field of research practice.*[10]

Therefore, if the disciplines are only placed next to each other, but the ideas and methods are not integrated and combined with each other, a correct inter-discipline has not been formed[11]. Of course, the desired integration of the National Academy of Sciences is an integration that can create a unified output from different disciplines (see: Figure 1).

9 - Thompson Klein and William Newell, "Advancing Interdisciplinary Studies", In J. Gaff and J. Ratcliffe, *Handbook of the Undergraduate Curriculum*: A Comprehensive Guide to Purposes, Structures, Practices, and Changes (San Francisco: Jossey-Bass, 1997), pp. 393-415

10 - National Academy of Sciences, National Academy of Engineering, and Institute of Medicine of the National Academies, *Facilitating Interdisciplinary Research* (Washington: The National Academies Press, 2005), p. 26.

11 - Ibid, p. 27.

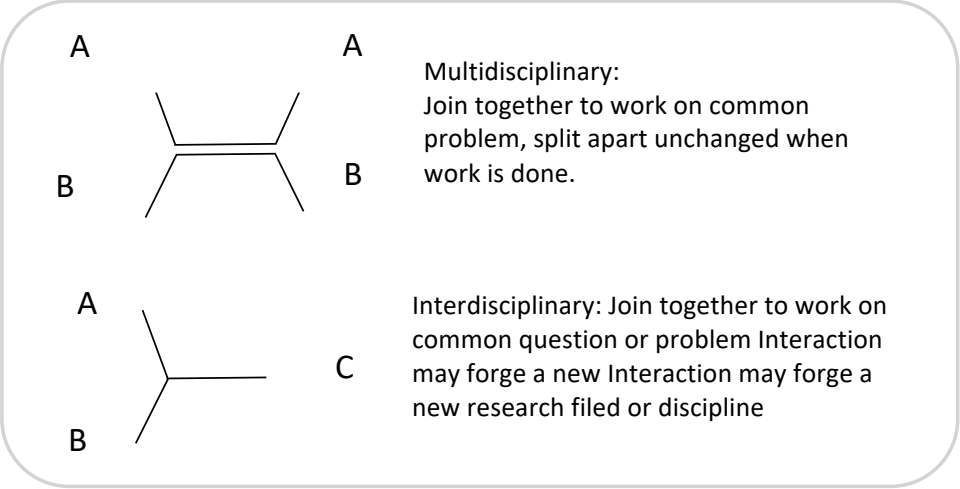

Fig. 1: Difference between multi-and interdisciplinary.[12]

In her significant article titled "Typologies of Interdisciplinarity," Klein adeptly elucidates the primary components of interdisciplinarity. According to her, these components include integration, effective interaction between disciplines, communication between disciplines, and composition.[13] Accordingly, the main components of interdisciplinarity can be summarized in two basic components: 1 (Cooperation and dynamic interaction between disciplines; 2) Complete integration of disciplines in such a way as to create a comprehensive view. The absence of either of these two elements can make interdisciplinary research challenging. In this article, Klein categorizes interdisciplinarity into three types based on the degree of integration: multidisciplinary, interdisciplinary, and transdisciplinary.

Repko et al. have astutely included a focus on real-world issues in their definition of interdisciplinarity, along with an emphasis on "integration." This definition alone represents the evolution of definitions related to this concept and highlights the problem-oriented approach in the interdisciplinary field:

> *Interdisciplinarity is a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline, and draws on the disciplines with the goal of integrating their insights to construct a more comprehensive understanding.*[14]

12 - Ibid.

13 - Julie Thompson Klein, "Taxonomy of Interdisciplinarity", In: Robert Frodeman, et el (eds), *The Oxford Handbook of Interdisciplinarity* (New York: Oxford University Press, 2010), p. 22.

14 - Allen F .Repko ,Rick Szostak & Michelle Phillips Buchberger, *Introduction to Interdisciplinary Studies.* (USA: SAGE Publications, 2nd ed., 2017), p. 50.

In the most recent work related to this field, Waldeck distinguishes between multidisciplinarity and interdisciplinarity as follows:

> *Interdisciplinarity is therefore not simply a matter of a scientific research context comprising several disciplines. It is in contrast to the concept of multidisciplinarity, where each discipline operates in isolation, whereas in interdisciplinarity the desirable objective would be to answer a question by transcending disciplines in order to produce integrated knowledge.*[15]

In addition to the above definitions based on integration or attention to real-world problems, others have classified interdisciplinarity according to whether it is "methodological" or "theoretical."

2. Methodological and Theoretical Interdisciplinarity

The distinction between methodological and theoretical interdisciplinarity lies in the one-way or two-way relationship between disciplines. Methodological interdisciplinarity involves borrowing methods or concepts from other disciplines to test theories, answer research questions, or develop theories.[16] This type is known as methodological pluralism and can be seen as an employer-employee (Khadem va Makhdum) relationship between the main field and the servant discipline.[17] One is considered as the main field (servant) and the other plays the role of servant discipline and a tool to solve the problems of the main field.[18] The application of psychological tests in the discipline of education and training, as well as the use of neurophysiology measures in psychology are examples of methodological interdisciplinarity.[19] The common element in these definitions is a one-way relationship between two disciplines, where a method or concept from one discipline is placed at the service of another discipline. However, theoretical interdisciplinarity includes Integration of propositions between disciplines, and new Integrations based on the connection between models and metaphors.[20] In the theoretical interdisciplinarity, there is a suitable combination between the concepts, propositions, and even the methods of the disciplines. This also includes two-way achievements for the beneficiaries of interdisciplinary study.

---

15 - Roger Waldeck, *Methods and Interdisciplinarity* (U.K and U.S.A: ISTE Ltd and John Wiley, 2019), Vol. 1, p. xii.

16 - Ahmad Pakatchi, *Specialized Research Method* (Iran: Imam Sadegh Scientific Association, 2011), pp. 119-120.

17 - Ibid, pp.

18 - Ibid.

19 - Henrik Bruun et al ,.*Promoting interdisciplinary research :The case of the Academy of Finland* (Helsinki: Publications of the Academy of Finland, 2005), pp. 87-89.

20 - Klein, Op, cit., "Taxonomy of Interdisciplinarity," p. 20.

This article focuses on the methodological interdisciplinary relationship (Khadem va Makhdum) between experimental sciences and Qur'anic studies. Three main achievements are discussed based on the level of integration between the two disciplines. It should be noted that these three categories are based on the level of integration of two disciplines:

The first category involves only applying empirical knowledge to Qurʾānic studies without any development or production. So, these comparisons only can be used in theological controversies. The second category leads to the development of the discipline of Qurʾānic interpretation by borrowing from experimental sciences. By utilizing experimental methods, numerous empirical issues that were previously problematic and ambiguous for commentators are now clarified. The third and most complex category leads to the development of knowledge in experimental sciences through interdisciplinary connections with Quranic studies. Examples are provided for each type.

3. Developing theological insights for the Qur'ān

The approach of "theological comparison" aims to address potential misunderstandings by comparing the propositions of experimental sciences with the verses of the Qurʾān.[21] Such comparisons have mostly been employed by commentators to defend the Qurʾān against opponents and to establish the perceived incompatibility between the Qur'an and science.[22] However, some commentators have noted that the level of integration between the two is limited, leading them to view it as mere comparison rather than interdisciplinary research.[23] Others, do not consider such comparisons to be called exegesis.[24] Accordingly, Dhahabi[23] says about the exegesis of Tantawi, in which he has extensively compared experimental issues with the verses of the Qur'an: 'There is everything in it except exegesis'[25]. While this approach has been used to defend the Qurʾān against doubts and highlight perceived conflicts with science, it may not necessarily lead to a deeper understanding of the text.[26]

For instance, when Rashid Riḍā28 talks about angels and jinn, he first points to the denial that materialists and scientists have towards these creatures. Then, referring to "mikrob" in experimental sciences, he talks about the relation it can have with "jinn". Accordingly, such

21 - Ghasem Darzi, Ahad Faramarz Gharamaleki, Mansour Pahlevan "Typologies of Quranic interdisciplinary studies", *Interdisciplinary Studies in Humanities*, Vol. 5, No. 4 (2013), p. 76. DOI:10.7508/isih.2014.20.004

22 - طنطاوی جوهری، **الجواهر في تفسير القرآن الكريم**، (بيروت: دار إحياء التراث العربي، 1412).

23 - محمد حسين طباطبائي، **الميزان في تفسير القرآن** (إيران، قم: منشورات جماعة المدرسين في الحوزة العلمية، 1417)، ج1، ص8.

24 - محمد حسين الذهبي، **التفسير والمفسرون** (القاهرة : دار الكتب الحديثة)، ج2، ص51.

25 - ترسم في اللغة العربية كالآتي: "فيه كلّ شيء إلا التفسير".

26 - للاستزادة: محمد رشيد رضا، تفسير المنار (بيروت، دار المعرفة، 1990)، ج8، ص409؛ وأيضًا: جوهری، ج1، ص49؛ ج10 ، ص198-199.

an interpretation of these creatures is evaluated as compatible with science.[27] He then refers to a narration in which the plague is considered as a jinn, and he uses this narration to confirm his comparison between jinn and microbe. It is clear that this interpretation has theological benefits more than anything else, and from Rashid Riḍā's point of view, such a feeling shows the compatibility of science with Quranic propositions and concepts.

This type of interdisciplinarity also includes comparing related verses in the Qur'an with Newton's general law of gravitation. The comparison of verse 2 of Surah Al-Ra'd and 7 of Surah Al-Dhariyat with the law of gravitation is worthy of attention.

Newton's law of gravitation in physics is defined as follows:" The gravitational force between two particles is directly proportional to the product of the masses of the two particles, and inversely proportional to their distance from each other."[28] It is because of this force that the object that is at a distance from the ground falls to the ground and the object that is on the ground is pulled towards the ground. Clearly, this definition is quite distinct, clear, and partial to gravity, but when we refer to the Quranic propositions that the claimants consider to be an equivalent for Newtonian attraction, we are not at all faced with such clarity, distinction, and detail. Note the second verse of Surah Ar-Ra'd:

﴿ٱللَّهُ ٱلَّذِى رَفَعَ ٱلسَّمَٰوَٰتِ بِغَيْرِ عَمَدٍ تَرَوْنَهَا..﴿٢﴾﴾ [الرعد: 2]؛

"It is Allah who erected the heavens without pillars that you [can] see...."

In this noble verse, we are confronted with the similitude of the heavens and their creation into a structure and the way it is raised. Just as a structure needs columns, so do the heavens need columns, but columns that cannot be seen. When the quasi-mode is omitted from the simile, it will be possible for people with different attitudes to consider the quasi-mode according to their assumptions. To consider Newtonian gravity as the intended meaning of this Qurʾānic phrase is only one of the possible assumptions and of course many other cases are also possible. Therefore, while Newton's law is defined clearly and precisely, Qurʾānic verses are often subject to multiple interpretations, contingent upon the reader's perspective. However, many researchers have simply considered and interpreted

27 - رضا، ج7، ص266.

28 - Isaac Newton, *Philosophiæ Naturalis Principia Mathematica*, Translated by Andrew Motte (London: Benjamin Motte, 3rd ed., 1729), p. 392.

these verses as similar to the law of gravity. Rashid Riḍā believes that the sky does not fall to the earth due to gravity, and this is the appropriate interpretation for the phrase "والسماء بناء" in the verse [2: 22][29]:

﴿ٱلَّذِي جَعَلَ لَكُمُ ٱلۡأَرۡضَ فِرَٰشٗا وَٱلسَّمَآءَ بِنَآءٗ وَأَنزَلَ مِنَ ٱلسَّمَآءِ مَآءٗ فَأَخۡرَجَ بِهِۦ مِنَ ٱلثَّمَرَٰتِ رِزۡقٗا لَّكُمۡۖ فَلَا تَجۡعَلُواْ لِلَّهِ أَندَادٗا وَأَنتُمۡ تَعۡلَمُونَ ٢٢﴾ [البقرة 22]

"[He] who made for you the earth a bed [spread out] and the sky a ceiling and sent down from the sky, rain and brought forth thereby fruits as provision for you. So do not attribute to Allah equals while you know [that there is nothing similar to Him]:"

Lot's wife looked back, and she thereupon turned into a pillar of salt.[30]

Marefat in the interpretation of the verse ﴿وَٱلسَّمَآءِ ذَاتِ ٱلۡحُبُكِ ٧﴾ [Al-Dhariyat:7][31] related it to the verse﴿ٱللَّهُ ٱلَّذِي رَفَعَ ٱلسَّمَٰوَٰتِ بِغَيۡرِ عَمَدٖ تَرَوۡنَهَاۖ﴾ [Al-Ra'ad: 2].[32] He refers to the pillars that are in the sky and are connected like a network (hubok) as the invisible forces between the sky and the earth; It means gravity, he knows.[33]

Here he mentioned the new scientific theories based on which there is a tensile force between bodies. Besides, there is a gravitational force between the Sun and the Earth, as well as between the Sun and other planets such as Mercury and Venus, which causes these planets to revolve around the Sun.[34] Generally, these comparisons do not have significant achievements for experimental sciences or Qurʾānic studies, and more than anything else, they show that the Qurʾān does not conflict with science. Otherwise, the relationship between Qurʾān and empirical sciences is not always like this. There are many examples in which interdisciplinary integration is stronger than the first type. In the second type, interpretive perspectives are developed through linkage with empirical methods.

---

29 - رضا، ج1، ص157.

30 - Biblia, by Lgos (Genesis, 19:26). https://biblia.com/bible/nkjv/genesis/19/26.

31 - By the heaven containing pathways.

32 - The Noble Quran ,Al-Ra'ad Chapter ,Verse ,2 could be translated as" :Allah is the one who raised the heavens without any pillars that you can see".

33 - محمد هادي معرفة، التمهيد في علوم القرآن (إيران، مؤسسة التمهيد، 2008)، مج6، ص123.

34 - Ibid.

4. Generating exegetical insights for Qur'an commentators

This type involves utilizing natural sciences to gain a deeper understanding of the Qurʾānic verses. It allows commentators to borrow from the views and findings of natural sciences to enhance their analysis of the text.

In this type, certain verses with complexities can be simplified and clarified through the application of experimental science. The use of experimental methods can aid in interpreting the verses, unlike the previous type where such comparisons did not yield significant results. This approach can lead to the development of new interpretative concepts for the verses.

Examples of this type include connecting verse 88 of Surah an-Naml with climatology, verse 59 of Surah āl-'Imrān with biological evolution, and verses related to the destruction of Lot's tribe with archaeology. These connections demonstrate how natural sciences can provide a different understanding of these verses that was not previously possible through traditional methods. Thus, the interdisciplinary integration of natural sciences and Qurʾānic studies is a significant achievement.

4.1. Mountain's passing like as that of clouds

In the verse [27: 88], a strange comparison is made between mountains and clouds:

﴿وَتَرَى ٱلۡجِبَالَ تَحۡسَبُهَا جَامِدَةٗ وَهِيَ تَمُرُّ مَرَّ ٱلسَّحَابِۚ صُنۡعَ ٱللَّهِ ٱلَّذِيٓ أَتۡقَنَ كُلَّ شَيۡءٍۚ إِنَّهُۥ خَبِيرُۢ بِمَا تَفۡعَلُونَ٨٨﴾ [النمل: 88]؛

"And you see the mountains, thinking them rigid, while they will pass as the passing of clouds. [It is] the work of Allah, who perfected all things. Indeed, He is Acquainted with that which you do."

The passing of mountains in these verses has been interpreted in various ways throughout history, with some considering it a sign of the Day of Judgment. However, contemporary commentators with a scientific and experimental approach have related these verses to the passing of mountains in this world.[35]

According to Tabresi,[37] the passing of mountains in these verses is associated with the time when they are uprooted by the earthquake of the Day of Judgment, causing them to become soft and unstable like beaten wool:[5 :111] ﴿وَتَكُونُ ٱلۡجِبَالُ كَٱلۡعِهۡنِ ٱلۡمَنفُوشِ٥﴾ .[36] In

35 - محمد بن عمر فخر الدين الرازي، **التفسير الكبير** (بيروت: دار إحياء التراث العربي، 1999)، ج24 ، ص574؛ محمد بن جرير الطبري، **تفسير الطبري: جامع البيان في تأويل القرآن**، تحقيق عبد الله تركي (القاهرة: دار هجر، 2001)، ج20 ، ص15؛ **طباطبائي**، ج15، ص401.

36 - فضل بن حسين طبرسي، **مجمع البيان في تفسير القرآن**، تقديم محسن الأمين العاملي (بيروت: مؤسسة الأعلمي، 1995) ، ج15، ص370.

the modern era, scholars with a scientific and experimental approach have linked these verses to the passing of mountains in our world.37 It appears that without taking into account the latest scientific developments in the fields of geology and climatology, it is difficult to fully comprehend the comparison between the mountain and the cloud mentioned in this verse. Therefore, some of the most significant similarities between the two are:

1- Clouds can be seen moving in different positions in the sky, resulting from different currents that are pushing them. Similar to this feature, earth's plates have different orbital, meridian and vector movements along latitude and longitude. These movements cause the different side of the mountain ranges that are riding on them.[38]

2- The terrestrial observer sees the clouds moving slowly in the sky. The detection of the distance that the clouds have travelled is achieved by reversing the look from them within a few minutes. Earth's plates also have a calm movement and can only be measured in terms of their time intervals of several million years, their direction and speed of movement.[39]

3- In meteorology, the movement and ride of the warm air mass on the cold air mass is known as the hot front. This move creates a system of clouds known as the warm front. Over-thrust in the mountains is also a phenomenon that is similar to the mechanism for mounting the hot air mass at the forehead on the cold air mass. Therefore, as the warm front clouds are the result of a warm air mass mounted at the collision site on the cold air mass; the mountains are also seen at the site of the pushing of a plate on the other.[40]

The Qurʾānic verses that draw parallels between mountains and clouds have long been a source of ambiguity for commentators. However, recent advancements in geology and meteorology have shed new light on these similarities, providing valuable insights into their meaning. This empirical discipline has proven to be a valuable tool in contemporary exegesis, allowing for a deeper understanding of the Qurʾān and its teachings.

4.2. The destruction of the people of Lot and new archaeological discoveries

In the Qurʾān and many other holy books before it that are, in some people's opinion, difficult to

---

37 - جوهری؛ وناصر مکارم شیرازي، **تفسیر نمونه** (تهران: دار الکتب الإسلامیة، 1415ھ).

38 - Gholamreza Barati, "Scientific Explanation of Mountains Movement on verse 88 of Surah al-Naml from the Noble Qur'an", *Journal of Interdisciplinary Quranic Studies*, Vol. 1, No. 2 (December 2022), p. 202.

39 - Ibid.

40 - Steve Earle, *Physical Geology* (Gabriola Island: BC campus, 2015). https://pita.ess.washington.edu/tswanson/wp-content/uploads/sites/9/2018/10/Physical Geology_StephenEarle.pdf

verify. However, new scientific discoveries, especially archaeological evidence, have unveiled the reality of these events and provided more details for interpreters to work with. according to that opinion, these empirical findings have two important implications for Qurʾānic studies: firstly, they have led us to consider many historical events in these texts as real rather than mythical or symbolic; secondly, they have provided us with significant details about these events. One very notable example in this regard is the quality of the destruction of the people of Lot.

The story of Lot's people is mentioned both in the Qurʾān and in the Book of Genesis of the Torah (Chapters 11-14 and 19). In the 19th chapter of Genesis (23 to 25), after the story of Lot and their sins, it is said about the quality of their destruction:

> *By the time Lot had come to Tzo'ar, the sun had risen over the land. Then Adonai caused sulfur and fire to rain down upon S'dom and 'Amora from Adonai out of the sky. He overthrew those cities, the entire plain, all the inhabitants of the cities and everything growing in the ground. But his wife looked back from behind him, and she became a column of salt.*

In this Torah narrative, the main reason for the destruction of the people of Lot is believed to be a heavenly punishment. This punishment was a combination of sulfur and fire. Additionally, in the last part of this passage, there is a completely ambiguous discussion about Lot's wife: what does it mean that "She looked back from behind him, and she became a column of salt"? Also, what cosmic event occurred that could completely destroy a great nation?!

The Qurʾānic narrative in [11: 82-83] and [29: 34-35] describes the punishment that befell the people of Lot:

﴿إِنَّا مُنزِلُونَ عَلَىٰٓ أَهۡلِ هَٰذِهِ ٱلۡقَرۡيَةِ رِجۡزٗا مِّنَ ٱلسَّمَآءِ بِمَا كَانُواْ يَفۡسُقُونَ٣٤﴾
[العنكبوت: 34]

> "Indeed, we will bring down on the people of this city punishment from the sky because they have been defiantly disobedient." [29:34].

In Surah al-Ankabut, it is stated that this punishment was a heavenly one that led to the destruction of Lot's people. However, Surah Hud provides more details

about this punishment, explaining that Lot's people were destroyed by stones made of baked clay that rained down from the sky:

﴿فَلَمَّا جَآءَ أَمۡرُنَا جَعَلۡنَا عَٰلِيَهَا سَافِلَهَا وَأَمۡطَرۡنَا عَلَيۡهَا حِجَارَةٗ مِّن سِجِّيلٖ مَّنضُودٖ ٨٢﴾ [هود: 82]

"So when Our command came, We made the highest part [of the city] its lowest and rained upon them stones of layered hard clay, [which were]" [11: 82].

According to both the Torah and the Qurʾān, it can be concluded that Lot's people were destroyed by a cosmic and heavenly event, which caused a rain of stones made of baked clay, sulfur, and fire to fall upon them. Salt also played a prominent role in this punishment and devastation. However, some might wonder whether this events were real or symbolic. If it was indeed real, what cosmic event could have caused such a significant impact and led to such massive destruction?

One of the newest archaeological studies has provided us with very detailed information in this field and has been able to answer many of our questions.[41] This research indicates that the people of Lot were destroyed by a cosmic event. According to this study, an event in the vicinity of the city of Tall al-Hammam in present-day Jordan caused this city to be completely destroyed about 3650 years ago. It is estimated that this meteorite was about 1000 times more powerful than the atomic bomb dropped on Hiroshima. Estimates suggest that a meteorite about 50 meters wide and 4 kilometers high exploded on the ground, causing temperatures of around 2000 degrees and melting all objects and causing the destruction of humans.

This city was one of the largest human civilizations during the Bronze Age and was suddenly destroyed and lost for thousands of years. Now, with this new archaeological study, new dimensions of this city and its destruction have been revealed. The references in the Qurʾān and the book of Genesis in this regard gain a different importance with this new discovery, and we can gain more knowledge about their details. Although it is not certain that this destroyed city is the same as the people of Sodom, there is evidence in this regard, especially since this study

41 - Ted E. Bunch, et al. "A Tunguska sized airburst destroyed Tall el Hammam a Middle Bronze Age city in the Jordan Valley near the Dead Sea", *Scientific Reports*, Vol. 11, No. 1 (2021). https://doi.org/10.1038/s41598-021-97778-3

provides a good explanation of how this fertile area suddenly turned into a salt marsh, and in the narrative of Genesis, Lot's wife turns into salt after looking back.

Undoubtedly, this new scientific discovery highlights the necessity of deepening the connection between modern sciences, especially archaeology and studies of sacred texts. Careful examination of this archaeological study and attention to the vast connections between the Qurʾān and Genesis can create a two-way interaction and dialogue between modern science and studies of sacred texts.

5. Generating new perspectives in natural sciences

The Qurʾānic concept of purity is introduced as a crucial factor for understanding texts, especially the Qurʾān. The verses in which this concept is mentioned establish a clear relationship between spiritual and material factors related to purity and human cognition. This idea is not yet considered in cognitive sciences, and if proven by empirical tests, it can introduce a new component to cognitive sciences. This approach differs from previous types, where the main idea and method were taken from empirical sciences and used in Qurʾānic studies. Also, the connection between the brain of the heart in cognitive sciences and the thinking heart in the Qurʾān can be a good example for developing new insights in experimental sciences using Qurʾānic concepts.

Here, we move from the Qurʾān towards empirical sciences to generate new ideas in natural sciences.

5.1. The role of "purity" in enhancing cognitive abilities of the brain

In the Qurʾān, derivatives of the root "Ṭ-H-R" have been used more than 31 times and "denotes the absence of *prohibited* impurity of any kind",[42] and through numerous verses, a corresponding relationship between purity and the understanding and logical acceptance of truth has been established. For example, in verses containing strong oaths related to the Qurʾān, it becomes clear that without purity, it is impossible to connect with the content of this book and understand it.

42 - Holger M. Zellentin, "Purity and Punishment in the Qur'an", In Bernhard Palme and Holger M. Zellentin, *Law Beyond Israel: From the Bible to the Qur'an* (U.K: Oxford University Press, 2022), p. 284. https://doi.org/10.1093/oso/9780199675579.003.0005

﴿فَلَآ أُقۡسِمُ بِمَوَٰقِعِ ٱلنُّجُومِ ۝٧٥ وَإِنَّهُۥ لَقَسَمٞ لَّوۡ تَعۡلَمُونَ عَظِيمٌ ۝٧٦ إِنَّهُۥ لَقُرۡءَانٞ كَرِيمٞ ۝٧٧ فِي كِتَٰبٖ مَّكۡنُونٖ ۝٧٨ لَّا يَمَسُّهُۥٓ إِلَّا ٱلۡمُطَهَّرُونَ ۝٧٩﴾ [الواقعة: 79-75]

"Then I swear by the setting of the stars,* And indeed, it is an oath - if you could know - [most] great.* Indeed, it is a noble Qur'an*In a Register well-protected;* None touch it except the purified." [56: 75-79]

In these verses, "purity" has been introduced as the main factor for understanding texts, especially the Qurʾān.[43] However, adopting it as a factor to enhance cognitive abilities and has no precedent in cognitive sciences.

In another place (the Qurʾān, 10: 100), the positive relationship between impurity and contamination (*al-Rijs*) and reasoning and understanding is mentioned as the reason why some disbelievers do not believe:

﴿وَمَا كَانَ لِنَفۡسٍ أَن تُؤۡمِنَ إِلَّا بِإِذۡنِ ٱللَّهِۚ وَيَجۡعَلُ ٱلرِّجۡسَ عَلَى ٱلَّذِينَ لَا يَعۡقِلُونَ ۝١٠٠﴾ [يونس: 100]؛

"And it is not for a soul to believe except by permission of Allah, and He will place defilement upon those who will not use reason." [10: 100]

In the first verse, purity is considered as the main condition for understanding the Qurʾān, and in the second verse, a relationship is established between "Rijz" which means impurity and contamination, and the inability to reason and understand. However, it should be noted that this purity can be divided into two types: external and internal. In these verses, a clear relationship has been established between spiritual and material factors related to purity and human cognition.

So far, factors related to "purity" have not been considered as factors that can be considered in human cognition in cognitive sciences, and this research can introduce a new component to cognitive sciences if proven by taking inspiration from the Qurʾān. The closest researches are related to the relationship between cognitive disorders and cultural issues such as aging-related cognitive disorders. In the most relevant published works, two important articles can be mentioned that have addressed the relationship between aging, cognition, and culture. Gutchess & Boduroglu has discussed the relationship between culture, cognition, and aging in an article

43 - ملا فتح الله كاشاني، **منهج الصادقين في إلزام المخالفين** (تهران: جابخانه محمد حسن علي، 1336ه)، ج1، ص159؛ طباطبائي، ص137.

with the same title.44 A similar work was also done in 2002 by Park & Gutchess.[45] In these two studies, as it is clear, the relationship between culture, cognition, and aging has been considered. It seems that the Qurʾānic idea of the relationship between "purity" and cognitive abilities of the brain can introduce a new component to cognitive sciences if proven by empirical tests. Here, unlike previous types, the relationship established between the Qurʾān and empirical sciences is from the Qurʾān towards empirical sciences. While in previous types, the main idea and method were taken from empirical sciences and used in Qurʾānic studies, in other words, we moved from empirical sciences towards the Qurʾān.

5.2. The Brain of the Heart in Cognitive Science and the Thinking Heart in the Qurʾān (The Cognitive Interaction of the Human Brain and Heart)

For a long time, interpreters and Quranic scholars have been faced with an important issue in the Qurʾān. The attention given to the concept of "reason" in the Noble Qurʾān shows that there is no visible word in the Qurʾān that directly refers to "brain". Instead, for the functions of the brain, such as "thinking" and "understanding", reference is repeatedly made to the heart. For example, in [7: 179] it is said about the people of Hell that they had hearts with which they did not understand: "They have hearts with which they do not understand,"[46] and in [37: 50], it is said that the Qurʾān is a reminder for those who have a heart: "Indeed in that is a reminder for whoever has a heart or who listens while he is present [in mind]."[47] This deep connection between "thinking" and "heart" created a serious question about whether a coherent relationship could be found between the functions of the brain and heart.

This relationship is also in its infancy in empirical sciences, and significant results have not yet been achieved. One of the latest studies in this relationship in cognitive sciences refers to the cognitive interaction of the human brain and heart. The HeartMath Institute[48] has as shown in an independent study that contrary to popular belief that the heart only responds to commands that come in the form of neuronal signals, neuronal signals exist in the heart that actually have a considerable effect on brain function. These signals not only affect emotional processes but also

44 - Angela Gutchess and Aysecan Boduroglu, "Culture, Cognition, and Aging", In Sussan K. *Whitbourne, the Encyclopedia of Adulthood and Aging* (New Jersey: John Wiley & Sons, 2015(, pp. 1-5. "https://doi.org/10.1002/9781118521373.wbeaa210" DOI:10.1002/9781118521373.wbeaa210

45 - Denise C. Park, and Audrey H. Gutchess. "Aging, Cognition, and Culture: A Neuroscientific Perspective." *Neuroscience & Biobehavioral Reviews,* No. *26* (Pergamon, July 2002), pp. 859-867. DOI: 10.1016/s0149-7634(02)00072-6

46 - نص الآية: ﴿وَلَقَدۡ ذَرَأۡنَا لِجَهَنَّمَ كَثِيرٗا مِّنَ ٱلۡجِنِّ وَٱلۡإِنسِۖ لَهُمۡ قُلُوبٞ لَّا يَفۡقَهُونَ بِهَا وَلَهُمۡ أَعۡيُنٞ لَّا يُبۡصِرُونَ بِهَا وَلَهُمۡ ءَاذَانٞ لَّا يَسۡمَعُونَ بِهَآۚ أُوْلَٰٓئِكَ كَٱلۡأَنۡعَٰمِ بَلۡ هُمۡ أَضَلُّۚ أُوْلَٰٓئِكَ هُمُ ٱلۡغَٰفِلُونَ ١٧٩﴾ [الأعراف: 179].

47 - نص الآية: ﴿إِنَّ فِي ذَٰلِكَ لَذِكۡرَىٰ لِمَن كَانَ لَهُۥ قَلۡبٌ أَوۡ أَلۡقَى ٱلسَّمۡعَ وَهُوَ شَهِيدٞ ٣٧﴾ [ق: 37].

48 - For more details ,visit the following link :https//:www.heartmath.org/science

affect cognitive abilities such as attention, perception, memory, and problem-solving. In other words, not only does the heart respond to brain signals, but conversely, the brain also responds to similar signals from the heart and affects its function.

It should be noted that this research is a good indicator of the cognitive ability of the human heart. Of course, scientific research in this area is very new and limited, and many questions remain unanswered: What is the implication between the functions of the heart and cognitive perceptions? How can heart-related concepts interfere with cognitive understanding and insights? And how can establishing a relationship between the functions of the heart and brain help to complete and develop cognitive perceptions? It is also necessary to extract the meaning of "heart" and "brain" in the time of the revelation of the Qurʾān to establish a relationship between the functions attributed to the heart in the Qurʾān and those considered for the heart in modern science. It remains to be seen whether the meaning currently attributed to "brain" was understandable in that era or not. It is possible that the function now attributed to "brain" for thinking was attributed to "heart" in the time of the revelation of the Qurʾān, and "brain" was not a known phenomenon at that time. All of these are questions that can help to complete the related topics about "the brain of the heart" in cognitive sciences, while also transforming our understanding of what is meant by "thinking" in the Noble Qurʾān. It is clear that if such a cognitive relationship between the heart and brain is proven, the Qurʾān, as a prominent text that explicitly addresses this relationship, can play an important role in developing this idea in cognitive sciences.

Results

1- Types of methodological interdisciplinarity in Qurʾānic studies are: 1- applying empirical knowledge to Qurʾānic studies without any development or production. These comparisons only can be used in theological controversies; 2- The development of discipline of Qurʾānic interpretation by borrowing from experimental sciences; 3- The most complex category leads to the development of knowledge in experimental sciences through interdisciplinary connections with Qurʾānic studies. Examples are provided for each type;

2- Accordingly, three main achievements of the connection between experimental sciences and Qurʾānic studies are: 1- Developing theological insights from the Qurʾān; 2- Generating exegetical insights for Qurʾān commentators; 3- Generating new perspectives in natural sciences;

3- The aim of first approach (Developing theological insights for the Qurʾān) is to strengthen the faith of believers and address any doubts or uncertainties surrounding the Qurʾān by

comparing scientific achievements with the concepts contained in its verses. This approach is often referred to as "theological comparison" and involves comparing the propositions of experimental sciences with the verses of the Qurʾān;

4- The second approach (generating exegetical insights for Qurʾān commentators) involves utilizing natural sciences to gain a deeper understanding of the Qurʾānic verses. It allows commentators to borrow from the views and findings of natural sciences to enhance their analysis of the text. The use of experimental methods can aid in interpreting the verses, unlike the previous type where such comparisons did not yield significant results. This approach can lead to the development of new interpretative concepts for the verses;

5- The third approach (generating new perspectives in natural sciences) differs from previous types, where the main idea and method were taken from empirical sciences and used in Qurʾānic studies. The connection between the brain of the heart in cognitive sciences and the thinking heart in the Qurʾān can be a good example for developing new insights in experimental sciences using Qurʾānic concepts.

6- Discovering the most important types of connection between Qurʾānic Studies and Natural Sciences and using methodological interdisciplinary approaches and its intellectual gains can pave the path of interdisciplinary research in religious studies more than in the past. The three intellectual gains discussed in this article are different from each other in terms of complexity and depth of knowledge, and the latter type is higher than other types in terms of scientific production.

Recommendations

The third approach (generating new perspectives in natural sciences) is very new and has been less discussed in scientific researches. It is suggested that more samples of this type should be reviewed and evaluated for future research to enrich the theoretical discussions related to this type.

المراجع

أولًا: العربية

جوهرى، طنطاوى. **الجواهر في تفسير القرآن الكريم**. بيروت: دار إحياء التراث العربي، 1412هـ.

الذَّهبي، محمد حسن. التفسير والمفسرون. القاهرة: دار الكتب الحديثة.

رضا، محمد رشيد. **تفسير المنار**. بيروت: دار المعرفة، 1990.

طباطبائي، محمد حسين. **الميزان في تفسير القرآن**. إيران، قم: منشورات جماعة المدرسين في الحوزة العلمية، 1417هـ.

طبرسي، فضل بن حسين. مجمع البيان في تفسير القرآن، تقديم محسن الأمين العاملي. بيروت: مؤسسة الأعلمي، 1995.

الطبري، محمد بن جرير. **تفسير الطبري: جامع البيان في تأويل القرآن**، تحقيق عبد الله تركي. القاهرة: دار هجر، 2001.

الرازي، فخر الدين. محمد بن عمر. **التفسير الكبير**. بيروت: دار إحياء التراث العربي، 1999.

معرفة، محمد هادي. **التمهيد في علوم القرآن**. إيران: مؤسسة التمهيد، 2008.

ثانيًا: الفارسية

سحابى، يد الله. **خلقت انسان**، إيران، شركت سهامى انتشار، 1375هـ.

كاشاني، ملا فتح الله. **منهج الصادقين في إلزام المخالفين**. تهران: جابخانه محمد حسن علي، 1336هـ.

مشكينى، على. **خلقت در قرآن**، ترجمه حسين نژاد. دفتر نشر اسلامى، 1366هـ.

مكارم شيرازي، ناصر. **تفسير نمونه**، تهران: دار الكتب الإسلامية، 1415هـ.

ثالثًا: الأجنبية

References

Ajayi, Kassim Olusanmi. Solarin, T. & Lawani, Abisila O. "Speaking mathematically: The role of language and communication in teaching and learning of mathematics", In Nawachukwu Price Ololube, Peter James Kpolovie, Lazarus Ndiku Makewa, *Handbook of research on enhancing teacher education with advanced instructional technologies*. United States of America: IGI Global, 2015.

Aldhdhahby, Muḥammad Ḥasan. *al-tafsīr wa-al-mufassirūn* (in Arabic). B 2, al-Qāhirah: Dār al-Kutub al-ḥadīthah.

Alṭṭabry, Muḥammad ibn Jarīr. *tafsīr al-Ṭabarī: Jāmi‘ al-Bayān fī Ta’wīl al-Qur’ān* (in Arabic). taḥqīq ‘Abd Allāh Turkī, B 20; 5. al-Qāhirah: Dār Hajar, 2001.

Barati, Gholamreza. "Scientific Explanation of Mountains Movement on verse 88 of Surah al-Naml from the Noble Qur’an"*, Journal of Interdisciplinary Quranic Studies*, Vol.1, No. 2 (December 2022), pp. 195-209.

Barr, Stephen M. *Astudent’s guide to natural science*, Delaware: Intercollegiate Studies Institute, 2006.

Bruun, Henrik et al. *Promoting interdisciplinary research: The case of the Academy of Finland*, Helsinki: Publications of the Academy of Finland, 2005.

Bunch, Ted E. et al. "A Tunguska sized airburst destroyed Tall el Hammam a Middle Bronze Age city in the Jordan Valley near the Dead Sea", *Scientific Reports*, Vol. 11, No. 1 (2021). https://doi.org/10.1038/s41598-021-97778-3

Darzi, Ghasem., Gharamaleki, Ahad Faramarz & Pahlevan, Mansour. "Typologies of Quranic interdisciplinary studies", *Interdisciplinary Studies in Humanities*, Vol. 5, No. 4 (2013): pp. 73-102. DOI:10.7508/isih.2014.20.004

Fakhr Rāzī, Muḥammad ibn ʻUmar. *al-tafsīr al-kabīr* (in Arabic). B 24. Bayrūt: Dār Iḥyā' al-Turāth al-ʻArabī, 1999.

Golshani, M. "The Holy Quran and the Sciences of Nature." Accessed August 23, 2022, at https://www.al-islam.org/holy-quran-and-sciences-nature-mehdi-golshani.

Golshani, Mehdi. "The Holy Quran and the Sciences of Nature", Islamic Propagation Organization, Accessed August 23, 2022, at https://www.al-islam.org/holy-quran-and-sciences-nature-mehdi-golshani.

Guo, Rongxing. "Studying borders, evaluating border effects". In R. Q. Grafton, D. Shaw, & T. *Kompas, Cross-Border Resource Management*, Third Edition. UK: Edward Elgar Publishing, 2018.

Gutchess, Angela and Boduroglu, Aysecan. "Culture, Cognition, and Aging", In Sussan K. *Whitbourne, the Encyclopedia of Adulthood and Aging.* New Jersey: John Wiley & Sons, 2015, pp. 1-5. DOI:10.1002/9781118521373.wbeaa210

Hasan, M. K. *Natural Science from the Worldview of the Qur'an: An Introduction* - Volume 2. Malaysia: Institut Terjemahan & Buku Malaysia (ITBM), 2018.

Iqbal, Muhammad. *The Reconstruction of Religious Thought in Islam*. Pakistan: Iqbal Academy, 1930.

Jwhrī, ṭnṭāwī. *al-Jawāhir fī tafsīr al-Qur'ān al-Karīm*. (in Arabic). Bayrūt: Dār Iḥyā' al-Turāth al-ʻArabī, 1412AH.

Kāshānī, Mullā Fatḥ Allāh. *Manhaj al-Ṣādiqīn fī Ilzām al-mukhālifīn* (in Farisi). B1, Tihrān: Chāp′khānah-'i Muḥammad Ḥasan ʻAlī, 1336H.

Klein, J.T. "Taxonomy of Interdisciplinarity", In: Robert Frodeman, et al. (eds), The Oxford Handbook of Interdisciplinarity, New York: Oxford University Press, 2010.

Klein, J.T. *Interdisciplinarity: History, Theory and Practice*. Deteroit: Wayne State University Press, 1990.

Klein, J.T., & Newell, W. "Advancing interdisciplinary studies", In J. Gaff & J. Ratcliffe, *Handbook of the undergraduate curriculum: A comprehensive guide to purposes, structures, practices, and changes*. San Francisco: Jossey-Bass, 1997, pp. 393-415.

Ledoux, Stephen F. "Defining natural sciences" *Behavior Today*, Vol. 5, No. 1 (Spring 2002), pp. 34-36.

Maʻrifat, Muḥammad Hādī. *al-Tamhīd fī 'ulūm al-Qur'ān* (in Arabic). B 6. Īrān: Mu'assasat al-Tamhīd, 2008.

MashKīnā, 'lī. *khuliqat Durr Qur'ān* (in Farisi). tarjamahu ḥusain Nizhād, Tihrān : Daftar Nashr 'slāmī, 1366 AH.

Naik, Zakir. The Qur'an & Modern Science: Compatible or Incompatible?, Islamic Research Foundation, AHYA Multi-Media, 2022. http://www.islamguiden.com/arkiv/quran_science.pdf

National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. *Facilitating Interdisciplinary Research*. Washington, DC: The National Academies Press. 2005. https://doi.org/10.17226/11153.

Newton, Isaac. *Philosophiæ Naturalis Principia Mathematica,* Translated by Andrew Motte, 3rd ed., London: Benjamin Motte, 1729.

Pakatchi, Ahmad. *Specialized Research Method*. Iran: Imam Sadegh Scientific Association, 2011.

Park, Denise C., and Audrey H. Gutchess. "Aging, Cognition, and Culture: A Neuroscientific Perspective." *Neuroscience & Biobehavioral Reviews,* No. *26* (Pergamon, July 2002): 859-867. DOI: 10.1016/s0149-7634(02)00072-6

Repko, Allen F., Szostak, Rick & Buchberger, Michelle Phillips. *Introduction to Interdisciplinary Studies*. 2nd ed., U.S.A: SAGE Publications, 2017.

Riḍā, Muḥammad Rshīd. *Tafsīr Al-Manār* (in Arabic). Bayrūt: Dār al-Ma'rifah, 1990.

Sḥābī, yad Allāh. *khuliqat Insān* (in Farisi). Īrān, shrkt shāmā intishār, 1375AH.

Steve Earle, *Physical Geology.* Gabriola Island: BC campus, 2015. https://pita.ess.washington.edu/tswanson/wp-content/uploads/sites/9/2018/10/Physical-Geology_StephenEarle.pdf

Ṭabarsī, Faḍl ibn Ḥusayn. *Majma' al-Bayān fī tafsīr al-Qur'ān* (in Arabic). taqdīm Muḥsin al-Amīn al-'Āmilī, B 2; 15. Bayrūt: Mu'assasat al-A'lamī, 1995.

Ṭabāṭabā'ī, Muḥammad Ḥusayn. *al-mīzān fī tafsīr al-Qur'ān* (in Arabic). B1;15;19. Īrān, Qum: Manshūrāt Jamā'at al-Mudarrisīn fī al-Ḥawzah al-'Ilmīyah, 1417AH.

Waldeck, Roger. Methods and Interdisciplinarity, Vol. 1, UK, U.S.A: ISTE Ltd and John Wiley, 2019.

Zellentin, Holger M. "Purity and Punishment in the Qur'an", In Bernhard Palme and Holger M. Zellentin, *Law Beyond Israel: From the Bible to the Qur'an* .U K: Oxford University Press, 2022.https://doi.org/10.1093/oso/9780199675579.003.0005