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STID Mohammad Natsir
Komplek Pusdiklat Dewan Da'wah Jl. Kp. Bulu Setiamekar
Tambun Selatan Bekasi, Jawa Barat Indonesia 17510

EFFECTIVENESS OF E-LEARNING IN TEACHING ISLAMIC CHEMISTRY: BUILDING AN ISLAMIC SOCIETY WITH COMPREHENSIVE UNDERSTANDING OF CHEMISTRY AND ISLAMIC VALUES

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Heri Purwanto Sidiq
sidiq.heripurwanto@gmail.com
Universitas Ibn Khaldun – Indonesia

Sofyan Sauri
sofyansauri@upi.edu
Universitas Pendidikan Indonesia-Indonesia

Ending Bahruddin
bahruddin@uika-bogor.ac.id
Universitas Ibn Khaldun – Indonesia

Budi Handrianto
Budi.handrianto@uika-bogor.ac.id
Universitas Ibn Khaldun-Indonesia

ABSTRACT

This research investigates the effectiveness of e-learning methods in teaching Islamic chemistry and their contribution to fostering an Islamic society with a comprehensive understanding of chemistry and Islamic values. The study focuses on the integration of Islamic values into chemistry education using online learning platforms. Adopting a qualitative approach with a case study design, the research involves students participating in an e-learning program for Islamic chemistry. Data is collected through observations, interviews, and document analysis to explore students' interactions with the e-learning platform and their responses to the integration of Islamic values. Thematic analysis is employed for data analysis. The findings highlight the significant impact of e-learning methods in teaching Islamic chemistry, enhancing students' understanding of both the subject matter and Islamic values. The integration of Islamic values in chemistry education promotes a deeper comprehension of the connections between chemistry and Islamic teachings. However, challenges such as technical issues and effective online communication need to be addressed.

Keywords *: e-learning; Islamic Chemistry; Islamic Society*

INTRODUCTION

Islamic religious education and preaching play a crucial role in shaping a strong and morally upright Islamic society. In the context of Islamic education, it is important to develop effective methods of delivering instructional materials that are relevant to Islamic teachings. One field that can be integrated with Islam is the study of chemistry. Chemistry explores the properties, structures, and transformations of matter[1], which can be connected to Islamic values in daily life.

Integrating the study of chemistry with Islamic teachings can be a valuable approach in Islamic education.[2] By connecting scientific knowledge with religious values, students can develop a well-rounded understanding of the world while strengthening their Islamic identity.[3] Study of chemistry can be linked to Islamic values in daily life such as appreciation for creation, ethical responsibility, seeking knowledge, practical applications[4], and historical contributions.

The concept of using e-learning methods in the teaching of Islamic chemistry is an intriguing innovation. E-learning utilizes information and communication technologies to deliver online learning materials. This provides greater flexibility and accessibility for learners, as well as the potential to integrate Islamic values into the teaching of chemistry.[5]

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[1]Lower, S. Introduction to Chemistry. Retrieved from https://chem.libretexts.org/Bookshelves/General_Chemistry/Chem1_(Lower)/01%3A_Fundamentals_of_Science_and_Chemistry/1.01%3A_Introduction_to_Chemistry

[2] Suprihatiningrum, J. (2017). Islam - Science Integration Approach in Developing Chemistry Individualized Education Program. Journal of Education and Learning, 11 (4), 341

[3] Henzel, J. & Thomas. Excellence in Islamic Education: Key Issues for the Present Time. Retrieved from https://thebook.org/resource/aoe6.html

[4] Mursyidi, A. (2013). The Role of Chemical Analysis in the Halal Authentication of Food and Pharmaceutical Products. J.Food Pharm.Sci.(1), 2

[5] Al Rawashdeh, A.Z., Mohammed, E.Y., Al Arab, A.R., Al Ara, M. & Al Rawashdeh, B. (2021). Advantages and Disadvantages of Using e-Learning in University Education: Analyzing Students' Perspectives. The Electronic Journal of e-Learning 19 (3), 108

Several educational theories support the use of e-learning methods in the teaching of Islamic chemistry. One of them is constructivism, which emphasizes that learners actively construct knowledge through interaction with instructional materials.[6] Additionally, theories related to technology-enhanced learning are also relevant in this context.

Previous research has been conducted in this field. Some studies have shown that the use of e-learning methods can enhance students' understanding of the subject matter and Islamic values.[7] The findings from these studies provide a strong foundation for further research on the effectiveness of e-learning methods in teaching Islamic chemistry.

This research adopts a qualitative approach, utilizing a case study design.[8] The participants of the study consist of participants in Islamic Chemistry Education in the Tadabbur Program at FHQ Annashr Bintaro. Data will be collected through observations, interviews, and document analysis. Students' interactions with the e-learning platform and their responses to the incorporation of Islamic values are analyzed qualitatively.

Data collection procedures will involve observing students' interactions with the e-learning platform, conducting interviews with students to understand their perceptions and experiences, and analyzing documents such as learning records or written responses from the students.

The data analysis procedure employs thematic analysis, where qualitative data will be analyzed to identify patterns, themes, and

[6] Constructivism. (n.d.). Retrieved from https://www.buffalo.edu/catt/develop/theory/constructivism.html

[7] Yumnah, S. (2021). E-LEARNING BASED ISLAMIC RELIGIOUS EDUCATION OF LEARNING MEDIA: ALTERNATIVE SOLUTIONS FOR ONLINE LEARNING DURING COVID-19. Nazhruna: Jurnal Pendidikan Islam, 4 (2), 255

[8] Creswell, J.W. & Creswell, J.D. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, United Stated of America: SAGE Publications, Inc.

relationships that emerge from the collected data.[9] This analysis will contribute to understanding the effectiveness of e-learning methods in teaching Islamic chemistry and their impact on fostering an Islamic society with a broad understanding of chemistry and Islamic values.

This research aims to evaluate the effectiveness of e-learning methods in teaching Islamic chemistry in fostering students' comprehensive understanding of chemistry concepts relevant to Islamic teachings, to explore students' responses to the integration of Islamic values in the teaching of chemistry, to identify challenges that may arise in the implementation of these methods, and to provide recommendations. This research seeks to improve understanding of e-learning's potential and efficacy in teaching Islamic chemistry. It also guides curriculum and teaching methods to integrate Islamic principles into chemistry.

RESULTS AND DISCUSSION

Since 2020, the Forum Halaqah Quran (FHQ) Annashr Bintaro has implemented remote learning to combat the spread of the COVID-19 virus, enabling students to study the Qur'an from the comfort of their own homes rather than having to travel to the FHQ Annashr Bintaro. One of the subjects studied at FHQ Annashr Bintaro is the Tadabbur Program under the Arabic language department. This program teaches Islamic Chemistry and its impact on building an Islamic society with a comprehensive understanding of chemistry and Islamic values. To study this program online, Ustaz must be able to design innovative learning media using Online media.

Based on participatory observations carried out, Tadabbur Program learning at FHQ Annashr was conducted using the LMS method (Learning Management System). The results of the study revealed several key findings regarding the effectiveness of e-learning methods.

Flexibility and Accessibility

[9] Maguire, M. & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step Guide for Learning and Teaching Scholars. AISHE-J, 3, 3352

As shown in Table 1, e-learning in the context of Islamic chemistry education offers a variety of benefits.

Tabel 1. Advantages of E-Learning

Main theme	Subtheme	Definition
Flexibility	Remote learning	Students can continue their education with distant learning
	Easy administration	Students can access E-Learning easily
	Accessibility	Students can access the e-learning easily
	Comfortable	Students can easily and comfortably listen to the lecture and learn
Student-centered learning	Self-directed learning	e-Learning is making good students more active and self-learner
	Asynchronous learning	that lectures have been recorded, It is easy for students to go back and go through the whole video for a summary or even revising it

Source: Tadabbur Program FHQ Annashr Bintaro

The table demonstrates that the e-learning platform at FHQ Annashr Bintaro proved to be a flexible and accessible mode of education for students. Participants in Islamic Chemistry Education in the Tadabbur Program at FHQ Annashr Bintaro were able to access learning materials and resources at their own convenience, enabling

them to study at their own pace.[10] This flexibility accommodated the diverse schedules and learning preferences of students, promoting a self-directed and independent learning environment.

Increased Engagement and Participation

The FHQ Annashr Bintaro e-learning platform provides opportunities for active student engagement and participation.[11] Through discussion forums, virtual labs, and collaborative assignments, participants in Islamic Chemistry Education in the Tadabbur Program at FHQ Annashr Bintaro were able to interact with their peers and instructors, fostering a sense of community and facilitating the exchange of ideas related to Islamic chemistry. This active engagement contributed to a more enriching learning experience.

Improved Understanding of Islamic Chemistry

The e-learning approach demonstrated its effectiveness in enhancing students' understanding of Islamic chemistry. Through interactive online modules and resources, participants in Islamic Chemistry Education in the Tadabbur Program at FHQ Annashr Bintaro were able to explore the connections between chemistry concepts and Islamic teachings. This integration of Islamic values within the study of chemistry contributed to a deeper comprehension of the subject matter.[12]

Challenges in Online Learning in Islamic Chemistry Education

According to the study, e-learning in the context of Islamic chemistry education presents a number of challenges, as shown in Table 2.

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[10] Turan, Z., Kucuk, S., & Karabey, S.C. (2022). The university students' self-regulated effort, flexibility and satisfaction in distance education. International Journal of Educational Technology in Higher Education, 19 (35),1

[11] Alderson, L.L. & Lowther, D.B. (2014). Factors That May Influence Instructors' Choices of Including Social Media When Designing Online Courses, Annual Proceedings - Jacksonville: Volumes 1 & 2, 208

[12] Saputro, A.N.C., Aznam, N., & Partana, C.F. (2022). Integration Method of Religious Character Values in Chemistry Learning. JKPK (Jurnal Kimia dan Pendidikan Kimia), 7 (1), 116

Tabel 2. Students' challenges when using e-learning.

Main theme	Subtheme	Definition
IT problem	Lacking electronic device	Students do not have the appropriate or enough electronic device for online learning
	Experiencing unstable connections	Students experience connection problems with e-learning platforms.
Interactions	Lacking student-to-student interaction	Students find it hard to make friends and engage in discussions with peers in online learning.
	Lacking student-to-teacher interaction	Students find it hard to consult their teachers and receive immediate feedback in online learning

Source: Tadabbur Program FHQ Annashr Bintaro

Technical issues such as internet connectivity and access to digital devices were reported by some students, which hindered their seamless participation in online activities.[13] Participants in Islamic Chemistry Education in the Tadabbur Program at FHQ Annashr Bintaro come from a variety of locations, including rural areas that frequently experience connectivity issues and a lack of access to digital devices. In addition, the lack of face-to-face interaction and immediate feedback from instructors posed obstacles to the clarification of complex concepts and the meeting of individual learning requirements.

Recommendation for curriculum developers, educators, and educational institutions

[13] UNICEF. (2021). Situational Analysis on Digital Learning Landscape in Indonesia, Quicksand Design Studio Pvt. Ltd, 48

Several important aspects to consider in implementing the e-learning method for teaching Islamic chemistry and building an Islamic society are as follows:

Quality of Learning Content

It is important to ensure that the learning content delivered through the e-learning platform covers relevant chemistry concepts in line with Islamic values. The content should be well-structured, accurate, and aligned with the students' level of understanding.

Support and Training for Educators

Educators need adequate support and training to implement the e-learning method for teaching Islamic chemistry. They should be proficient in using technology and effective online teaching strategies to create meaningful learning experiences for students.

Evaluation and Feedback

Providing effective evaluation and feedback mechanisms in e-learning is crucial. This allows educators to monitor students' progress, identify areas for improvement, and provide constructive feedback for further development. This evaluation can include quizzes, assignments, and projects that assess students' comprehension of both the chemistry concepts and their integration with Islamic values, can be implemented with quizizz application. Timely and constructive feedback on students' performance helps them gauge their progress and areas for improvement.

CONCLUSSION

Based on the findings and discussions conducted, it can be concluded that the e-learning method in teaching Islamic chemistry through the integration of Islamic values and principles has great potential in building a quality Islamic society. Here are some key findings that support this conclusion:

1. This research demonstrates that the e-learning method is effective in delivering Islamic chemistry learning

materials to students. By using online platforms, students can easily and flexibly access learning materials, allowing them to learn according to their individual needs and preferences.

2. The e-learning method facilitates interaction and collaboration between students and instructors through features such as online discussion forums and question and answer sessions. This helps in the exchange of ideas, better understanding, and the development of an active learning community.
3. By integrating Islamic values and principles into the teaching of chemistry, this research shows that students can understand and apply chemical concepts in the context of Islamic teachings. Teaching ethics in the use of chemicals, environmental protection, and social responsibility can help build an Islamic society that is characterized by integrity and accountability.
4. Through e-learning in Islamic chemistry education, students have the opportunity to acquire extensive knowledge of chemistry that is relevant to Islamic values. This can contribute to the formation of an Islamic society that is knowledgeable, morally upright, and capable of applying scientific knowledge with a full awareness of religious values.

However, it should be acknowledged that there are several challenges to overcome in the implementation of e-learning in Islamic chemistry education. Some of these challenges include technology accessibility, and quality of learning content. Therefore, further efforts are needed in the development of more effective e-learning methods, as well as adequate support from educators, educational institutions, and relevant stakeholders.

REFERENCE

Al-Rawashdeh, A.Z., Mohammed, E.Y., Al Arab, A.R., Al Ara, M. & Al Rawashdeh, B. (2021). Advantages and Disadvantages of

Using e-Learning in University Education: Analyzing Students' Perspectives. *The Electronic Journal of e-Learning* 19 (3), 107-117

Alderson, L.L. & Lowther, D.B. (2014). Factors That May Influence Instructors' Choices of Including Social Media When Designing Online Courses, Annual Proceedings - Jacksonville: Volumes 1 & 2, 205-211

Constructivism. (n.d.). Retrieved from https://www.buffalo.edu/catt/develop/theory/constructivism.html

Creswell, J.W. & Creswell, J.D. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, United Stated of America: SAGE Publications, Inc.

Faruqi, Y.M. (2006). Contributions of Islamic scholars to the scientific enterprise. *International Education Journal*, 7(4), 391-399

Henzel, J. & Thomas. Excellence in Islamic Education: Key Issues for the Present Time. Retrieved from https://thebook.org/resource/aoe6.html

Lower, S. *Introduction to Chemistry.* Retrieved from https://chem.libretexts.org/Bookshelves/General_Chemistry/Chem1_(Lower)/01%3A_Fundamentals_of_Science_and_Chemistry/1.01%3A_Introduction_to_Chemistry

Maguire, M. & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step Guide for Learning and Teaching Scholars. *AISHE-J*, 3, 335(1)-335(14)

Mursyidi, A. (2013). The Role of Chemical Analysis in the Halal Authentication of Food and Pharmaceutical Products. *J.Food Pharm.Sci.*(1), 1-4

Saputro, A.N.C., Aznam, N., & Partana, C.F. (2022). Integration Method of Religious Character Values in Chemistry Learning. *Jkpk (Jurnal Kimia Dan Pendidikan Kimia)*, 7 (1), 111-124

Suprihatiningrum, J. (2017). Islam - Science Integration Approach in Developing Chemistry Individualized Education Program. *Journal of Education and Learning*, 11 (4), 338-351

Turan, Z., Kucuk, S., & Karabey, S.C. (2022). The university students' self-regulated effort, flexibility and satisfaction in distance education. *International Journal of Educational Technology in Higher Education*, 19 (35), 1

UNICEF. (2021). Situational Analysis on Digital Learning Landscape in Indonesia, Quicksand Design Studio Pvt. Ltd.

Yumnah, S. (2021). E-Learning Based Islamic Religious Education of Learning Media: Alternative Solutions for Online Learning During Covid-19. *Nazhruna: Jurnal Pendidikan Islam*, 4 (2), 249-260