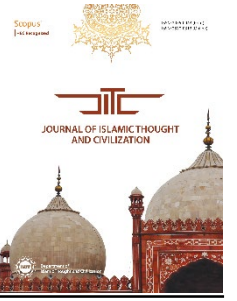
Journal of Islamic Thought and Civilization (JITC)
Volume 13 Issue 2, Fall 2023
ISSN$_{(P)}$: 2075-0943 ISSN$_{(E)}$: 2520-0313
Homepage: https://journals.umt.edu.pk/index.php/JITC

Article QR



Title:	**Integration of Ibn Sina's Universal Language Theory and Neuroscience in the Development of Learning Media**
Author (s):	Andi Musthafa Husain, Suyadi
Affiliation (s):	Universitas Ahmad Dahlan, Yogyakarta, Indonesia
DOI:	https://doi.org/10.32350/jitc.132.11
History:	Received: June 17, 2023, Revised: September 1, 2023, Accepted: October 26, 2023, Published: December 06, 2023
Citation:	Husain, Andi Musthafa, and Suyadi. "Integration of Ibn Sina's Universal Language Theory and Neuroscience in the Development of Learning Media." *Journal of Islamic Thought and Civilization* 13, no. 2 (2023): 164–177. https://doi.org/10.32350/jitc.132.11
Copyright:	© The Authors
Licensing:	This article is open access and is distributed under the terms of Creative Commons Attribution 4.0 International License
Conflict of Interest:	Author(s) declared no conflict of interest

A publication of
Department of Islamic Thought and Civilization, School of Social Science and Humanities
University of Management and Technology, Lahore, Pakistan

Integration of Ibn Sina's Universal Language Theory and Neuroscience in the Development of Learning Media

Andi Musthafa Husain*
Department of Islamic Religious Education,
Universitas Ahmad Dahlan, Yogyakarta,
Indonesia

Suyadi
Department of Islamic Religious Education,
Universitas Ahmad Dahlan, Yogyakarta,
Indonesia

Abstract

The current research attempted to integrate Ibn Sina's universal language theory and neuroscience in the development of learning media. It adopted a qualitative library method, with data collected from literature related to universal language theory, neuroscience, and the development of learning materials of Ibn Sina through manual and digital searches for relevant references. The data collected was analyzed by using content analysis which encompassed the data reduction, presentation, and the synthesis of new and comprehensive conceptual frameworks. The results showed that Ibn Sina's universal language theory offered valuable insights into the significance of language in communication and cognition. Neuroscience provided an understanding of how the human brain processes information and learns. The concepts associated with Ibn Sina's universal language theory and neuroscience, including elements, such as signs, meaning, and relationship between language and reality, were explored to examine their influence on learning media development. The understanding of the principles of human brain-based learning, based on the results of neuroscience, served as a foundation for effective learning media development. By integrating these attributes, the development of learning materials incorporated the conveyance of information in harmony with universal language comprehension and brain-based learning principles. Therefore, learning material developers and teachers should create instructional methods in accordance with advancements in science and technology.

***Keywords*:** development of learning media, Ibn Sina, neuroscience, universal language theory, Neuroscience

Introduction

The development of effective learning media is an important aspect in the education sector.[1] In this modern era, information and communication technology advancement has led to new opportunities for innovative and interactive learning media.[2] However, a nuanced consideration of

*Correspondence concerning this article should be addressed to Andi Musthafa Husain, Department of Islamic Religious Education, Universitas Ahmad Dahlan, Yogyakarta, Indonesia at suyadi@mpai.uad.ac.id

[1]Rian Vebrianto, and Kamisah Osman, "The Effect of Multiple Media Instruction in Improving Students' Science Process Skill and Achievement," *Procedia - Social and Behavioral Sciences*, 3rd World Conference on Educational Sciences - 2011, 15 (January 1, 2011): 346–50, https://doi.org/10.1016/j.sbspro.2011.03.099.

[2]Febblina Daryanes et al., "The Development of Articulate Storyline Interactive Learning Media Based on Case Methods to Train Student's Problem-Solving Ability," *Heliyon* 9, no. 4 (April 2023): e15082, https://doi.org/10.1016/j.heliyon.2023.e15082.

language theory and neuroscience is imperative to achieve optimal learning goals.[3] In the context of innovation and interactivity, realizing the maximum potential of learning media necessitates adhering to certain foundational factors. Among these factors is language, serving as the fundamental vehicle for conveying educational content. Additionally, embracing a comprehensive method to learning media entails integrating insights from neuroscience. It harnesses the intricacies of neural processes within the brain to optimize learning efficacy and outcomes.[4]

One significant contributor to the understanding of language is Ibn Sina, a prominent philosopher and physician from the 11th century.[5] The significant works *al-Isharāt wa al-Tanbihāt* (The Book of Directives and Remarks) lays out a universal language theory encompassing the aspects of grammar, semantics, and logic.[6] Additionally, relevant concepts, such as signs, meanings, and the intricate relationship between language and reality, were introduced. The contributions made by Ibn Sina to the general theory of language offered profound insights into how language influences thought, communication, and understanding.

Neuroscience has made significant strides in the past decade. The research on how the human brain processes information has provided valuable insights into developing effective learning methods.[7] By leveraging knowledge in neuroscience, learning media better suited to the cognitive functions and learning needs of the human brain tend to be effectively designed.[8]

Despite the advancements in both fields, the integration between general language theory proposed by Ibn Sina and contemporary neuroscience knowledge in the development of learning media, remains constrained. Therefore, the current study aimed to explore and integrate the concepts from the proposed general language theory with the knowledge in neuroscience. The overarching objective of the current research was to craft learning media that is more effective and align with the fundamental principles of both disciplines.

By integrating the general language theory and neuroscience principles, this research can significantly contribute to the development of learning media. The envisioned outcome is the creation of media that enhances understanding, communication, and the effectiveness of the learning process. By understanding how language and information processing in the human brain are interconnected, a more holistic and efficient method of learning can be developed.

[3]Husam Ahmed, "The Role of Visuals in Language Learning and Instructions," (March 3, 2019), https://doi.org/10.31185/lark.Vol0.Iss27.395.

[4]M. I. Fauzi, "Utilizing Neuroscience in the Design and Development of Arabic Language Curriculum," (2020), http://dx.doi.org/10.29240/jba.v4i1.1095

[5]Minten Apriani, and Syahidin Syahidin, "The Ibn Sina Perspective on Education Concept," *Islamic Research* 4, no. 2 (June 25, 2021): 71–80, http://jkpis.com/index.php/jkpis/article/view/78.

[6]"والتنبيهات الإشارات," in *Wikipedia*, May 12, 2023, https://en.wikipedia.org/w/index.php?title=Al-Isharat_wa_al-Tanbihat&oldid=1154385305.

[7]Kayla M. Kemp, and David P. Baker, "The Development of Intelligence: Education and Neuroscience," in *Encyclopedia of Behavioral Neuroscience, 2nd Edition (Second Edition)*, ed. Sergio Della Sala (Oxford: Elsevier, 2022), 339–45, https://doi.org/10.1016/B978-0-12-819641-0.00027-X.

[8]Panagiota Chalki, Angeliki Tsiara, and Tassos A Mikropoulos, "An Educational Neuroscience Approach in the Design of Digital Educational Games," n.d.

2. Theoretical Framework

2.1. Universal Language

In *al-Isharāt wa al-Tanbihāt* (The Book of Directives and Remarks),[9] Ibn Sina introduced the concept of a universal language. This concept explicates how human beings create mental images and process sensory information. The concept would be explored in-depth to understand its relationship with the development of interactive learning media in neuroscience.

An interesting aspect of this work was the emphasis from the onset that it was not intended for casual readers. Ibn Sina conveyed the message that only intelligent readers would be able to grasp the hidden truths behind the work. This raises the question: Why did Ibn Sina desist from explicitly presenting these truths? However, this stemmed from the fact that efforts to make ordinary readers understand the deepest truths in the work would likely be futile since they lacked adequate understanding. There would likely be misunderstandings, ultimately deviating from the intended truths. Ibn Sina decided that the best way was to conceal the intended truths.[10]

The view on the importance of a universal language reflects the desire of this individual to promote cross-cultural understanding and advancements in human communication. By employing a universal language, people can avoid the risks of misinterpretation that often emerge due to language and cultural differences.

The concept of a universal language, proposed by Ibn Sina, is rooted in improving the communication and fostering understanding among individuals from diverse backgrounds and cultures. This underscores the sensitivity towards the importance of overcoming communication barriers to facilitate the exchange of knowledge and understanding among humans.

2.2. Neuroscience

Neuroscience studies the nervous system and mental processes that occur in the human brain.[11] Gaining a solid grasp of this subject matter is of utmost significance for teachers and plays a central role in developing effective interactive learning media aligned with this field.[12]

Etymologically, neuroscience is the study of neural or nervous systems. This encompasses a multidisciplinary method to investigate the intricate functions of the nervous system and individual neurons. From a tterminological standpoint, neuroscience is specialized scientific research of the nervous system, encompassing the brain and all the extensive functions of the spinal cord.[13] It comprises of diverse disciplines, such as neurology, psychology, biology, mathematics, and technology. This consolidation of expertise is geared towards unravelling the complexities of how

[9]Ibn Sina, *Al-Isharāt wa al-Tanbihāt* (The Pointers and Reminders of Abu Ali Ibn Sina), Part Two, Third Edition (Corniche Al Nile - Cairo: Dar Al Ma'arif, 1119).

[10]Fakhruddin Muchtar, "The Book of Directives and Remarks", Bab I, Volume I 1," 2014, https://www.academia.edu/7568872/AL_ISYARAH_WA_AL_TANBIHAT_Bab_I_Jilid_I_1.

[11]Joseph J. Cooper, and Ashley E. Walker, "Neuroscience Education: Making it Relevant to Psychiatric Training," *Psychiatric Clinics of North America*, Medical Education in Psychiatry 44, no. 2 (June 1, 2021): 295–307, https://doi.org/10.1016/j.psc.2020.12.008.

[12]Fiona N. Y. Ching et al., "Preservice Teachers' Neuroscience Literacy and Perceptions of Neuroscience in Education: Implications for Teacher Education," *Trends in Neuroscience and Education* 21 (December 1, 2020): 100144, https://doi.org/10.1016/j.tine.2020.100144.

[13]K. Erickson, "Health Neuroscience: Defining a New Field," 2015, https://www.semanticscholar.org/paper/Health-Neuroscience%3A-Defining-a-New-Field-Erickson/8bce272983a612601d65438815f595d4f145841b.

the brain and nervous system function, react, and interact with the surrounding environment.[14] Neuroscience involves scientific methods, such as brain imaging, electrophysiology, and computational modelling. These methods are instrumental in shedding light on the functions of the brain and nervous system in relation to human behavior, cognition, and emotions. However, the implications of neuroscience extend beyond the theoretical aspect. It finds practical applications in various domains. These include the development of therapeutic interventions and medical technologies, the enhancement of educational and learning methods as well as the cultivation of more sophisticated information and communication technologies.[15]

Neuroscience holds potential as a foundation for advancing education and learning methods, however, it should not be misconceived as an entirely new educational system.[16] A comprehensive education method should consider the development of all aspects of students, including their cognitive and intellectual abilities. In this context, neuroscience plays a vital role in shaping the holistic and effective learning strategies that take into consideration all attributes of students.[17]

The fundamental purpose of education is to nurture the individuals so that they could fully develop their potential or intelligence across physical, spiritual, and intellectual domains. However, this development should always be undertaken in conjunction with the integration of good moral values and ethics. This combined method ensures that students harness their capabilities and emerge as morally upright and socially valuable contributors to society.

2.3. Learning Media

Learning media are essential tools or resources used to assist the teaching process. These resources encompass diverse formats, such as print, visual, audio, and audio-visual media.[18] The appropriate use of these media can enhance the motivation and interest of students in learning, simultaneously facilitating their grasp of the material being taught.[19] Additionally, learning media fosters an interactive and experiential-based learning, allowing students to actively engage in the educational process.[20]

3. Method

The current research was based on a qualitative literature review. This method was selected to gain a deep understanding of universal language theory proposed by Ibn Sina, Neuroscience, and the

[14]Thomas H. Glick, and Andrew E. Budson, "Education and Communication about Memory: Using the Terminology of Cognitive Neuroscience," *American Journal of Alzheimer's Disease and other Dementias* 20, no. 3 (2005): 141–43, https://doi.org/10.1177/153331750502000306.

[15]Muchtar, *Al-Isyarah wa al-Tanbihāt* (Bab I, Volume I), 1.

[16]Asriyadin et al., "Improving Student Character and Learning Outcomes through a Neuroscience Approach Based on Local Wisdom," (2021), 050027, https://doi.org/10.1063/5.0043350.

[17]Aminul Wathon, "Neuroscience in Education," *Journal Lentera: Religious, Scientific, and Technological Studies* 13, no. 2 (September 15, 2015): 236–45, http://ejournal.kopertais4.or.id/mataraman/index.php/lentera/article/view/1324.

[18]Nurul Fitrahminarsih N et al., "Web-Based Learning Media the Skills of Suturing Rupture Perineum of Midwifery Students," *Gaceta Sanitaria*, *The 3rd International Nursing and Health Sciences Students and Health Care Professionals Conference* (INHSP), 35 (January 1, 2021): S248–50, https://doi.org/10.1016/j.gaceta.2021.07.017.

[19]Feriska Achlikul Zahwa, and Imam Syafi'i, "Selection of Information Technology-Based Learning Media Development," *Equilibrium: Journal of Educational and Economic Research* 19, no. 01 (January 29, 2022): 61–78, https://doi.org/10.25134/equi.v19i01.3963.

[20]Johannes Jefria Gultom, "Utilization of Media in the Teaching and Learning Process," 2016.

development of learning media through relevant literature analysis. In the current research, the primary data sources encompassed a variety of materials, spanning from books, scientific journals, articles, and relevant theoretical references. These sources are available in both, print and digital formats. The data collection process was executed through digital searches and explorations on platforms, such as Google Scholar and Science Direct. When searching for references, relevant keywords related to the research topic were used to ensure the accuracy and completeness of the collected data. The selected sources were based on their relevance to universal language theory, neuroscience, and the development of learning media.

The data analysis method used in the current research was based on content analysis. During the analytical phase, patterns, themes, and relationships among the concepts from the reviewed literature were meticulously evaluated. This method enabled the recognition of interconnected notions, paving the way for the developing fresh and comprehensive conceptual constructs. By adopting this method, the research aimed to make meaningful contributions to advancing and understanding the field.

The results would be presented clearly and systematically in subsequent chapters, which would entail procedures, such as data reduction and presentation, result analysis, and construction of new concepts. Furthermore, such concepts would enhance the understanding and provide inventive solutions for the advancement of effective and relevant learning media.

4. Results and Discussion

4.1. Concepts of Ibn Sina's Universal Language Theory and Neuroscience

In Chapter 1 of *al-Isharat* II, Ibn Sina highlighted the importance of a universal language. In this work, Ibn Sina emphasized the intricate relationship between the terms *lafz* (word) and *ma'na* (meaning). Ibn Sina also expounded on how specific terms exert influence on the expression of meaning. This led to the suggestion that logicians need to consider the use of a universal language, referred to as *bilughatin qaumin* (Universal Language). This universal language would encompass terms not limited to a specific group. The adoption of such a language would enable better communication and mutual understanding among people from different backgrounds and cultures.[21]

In Chapter 1 of *al-Isharat* II, Ibn Sina discussed the relationship between the terms *lafz* (word) and *ma'na* (meaning).[22] This exploration encompasses how the precise selection of terms influences the conveyance of meaning. Furthermore, Ibn Sina emphasized the importance of a universal language encompassing terms not limited to a specific group. A clearer understanding of the idea of a universal language is shown in the following figure:

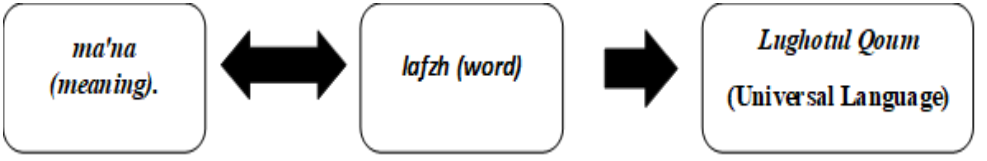


Figure 1. Understanding of the Idea of Universal Language

Figure shows that *lafz* is used to convey the intended *ma'na*, which signifies the essence or meaning of the words. This interrelation between *lafz* and *ma'na* indicates the possibility of their combined use, thereby forming a universal language.

[21]Muchtar, 'Al-Isyarah Wa al-Tanbihat (Chapter I, Volume I), 1

[22]Sina, *The Pointers and Reminders of Abu Ali Ibn Sina.*

Ibn Sina stated that a universal language including terms understandable to people from diverse backgrounds and cultures facilitate better communication. This eliminates linguistic barriers and enables an easier understanding among individuals of different languages and cultural affiliations. At the core of universal language theory, proposed by Ibn Sina, lies the pivotal concept of signs. These signs are instrumental in enabling the human beings to grasp and convey complex and abstract concepts. By using a universal language composed of signs, human beings can effectively communicate and understand each other without having a need for a shared linguistic background.

Ibn Sina reported that the interconnected relationship between language and reality carries profound implications for the development of learning media. These implications underscore the vital need for the learning media to accurately and lucidly depict the real world. This type of media should possess adept descriptive functions, enabling thorough explanations of objects or concepts. Additionally, learning media should symbolically represent objects or concepts to be understood by users from different linguistic and cultural backgrounds.

In order to achieve these goals, learning media developers can use various technologies and strategies encompassing images, videos, animations, and simulations. These technologies and strategies assist the users to visually and interactively comprehend the concepts or objects, making them easier to understand and remember. Furthermore, learning media developers should also use clear and easily understandable language. This method guarantees accessibility for users originating from diverse linguistic and cultural contexts.[23]

In learning media development, developers must also consider the context of media usage. Learning media should align with the goals and needs of the users while also showing flexibility to accommodate diverse levels of understanding and learning speed. By considering these factors, learning media can become an effective tool in helping the users to comprehend and represent reality.[24]

Neuroscience theory emphasizes the performance of the brain in thinking and cognitive activities. By harnessing the inherent capabilities of the brain, methods can be devised to suit a range of subjects in the learning process naturally. As this theory undergoes thorough evaluation, its application in learning activities becomes a foreseeable outcome. This theory has several advantages, including promoting students to achieve goals based on their brain capabilities, empowering teachers as catalysts to achieve success, and providing new insights into how the human brain operates.[25]

This theory has some limitations as well. Moreover, the majority of education in Indonesia still focuses on cognitive and intellectual aspects, primarily fostering development in the left hemisphere of the brain. Students who adhere to conventional modes of thinking (aligned with previously accepted opinions) might encounter difficulties while attempting to integrate this theory into their learning process. Teachers are tasked to acknowledge both the strengths and limitations associated with neuroscience theory in the context of education. The challenge is to craft learning methods that

[23]David Yaden, and Theresa Rogers, "Volume 10: Literacies and Languages Education," in *International Encyclopedia of Education (Fourth Edition)*, ed., Robert J Tierney, Fazal Rizvi, and Kadriye Ercikan (Oxford: Elsevier, 2023), xix–xxiv, https://doi.org/10.1016/B978-0-12-818630-5.02010-8.

[24]Senata Adi Prasetia et al., "Ibn Sinā's Psychology: The Substantiation of Soul Values in Islamic Education," *ATTARBIYAH: Journal of Islamic Culture and Education* 7, no. 2 (2022): 171–89, https://doi.org/10.18326/attarbiyah.v7i2.171-189.

[25]Akhsani Sholihati Yasri, and Suyadi Suyadi, "Arabic Language Learning Strategies Based on Neuroscience: Arabic Language Learning Strategy Based on Neuroscience," *Insyirah: Jurnal Ilmu Bahasa Arab dan Studi Islam* 5, no. 2 (December 14, 2022): 104–17, https://doi.org/10.26555/insyirah.v5i2.5783.

effectively align with the diverse capacities of student's brains. In this endeavour, teachers must also be attuned to distinctive individual variations among students. The method should involve designing learning experiences to accommodate the unique requirements and capabilities of each student.[26]

4.2. Implementation of Instructional Media Development

Learning media refers to instrumental tools and resources designed to facilitate the process of teaching. This media encompasses a range of formats including print, visual, audio, and audio-visual elements. The skilful use of learning media holds the potential to amplify students' motivation and eagerness to learn, while also aiding in the understanding of the material being taught. Additionally, it creates an avenue for interactive and experiential-based learning, allowing students to actively engage in the academic process. The results provided several examples of the development and use of learning media in different educational contexts. For instance, one research developed e-learning media for the subject of educational statistics, leading to improved students' learning outcomes.[27] Another research introduced echinoderm comics as learning tools for Junior High School students, resulting in increased motivation and comprehension of the material.[28] In the backdrop of the education 4.0 era, the use of technology in the learning process is becoming increasingly important. One of this research developed a 3D map of dry land use based on aerial images as a learning medium to exemplify this importance.[29] The judicious use of appropriate learning media enhances the quality of teaching and learning by providing students with immersive, interactive, and engaging learning experiences.

In order to facilitate the classification of the integration of Ibn Sina's universal language theory and neuroscience in the development of learning media, the researches that focused on crafting learning media were identified. These researches were systematically sorted and grouped based on the type of media developed. A visual understanding of this classification is shown in the following table:

Table 1. Classification of the Integration of Ibn Sina's Universal Language theory and Neuroscience

Researcher Name	Research Title	Discussion	Developed media
Suyadi [30]	The fiqh of disaster: The mitigation of COVID-19 in the perspective of Islamic education-neuroscience	The research focused on the implementation of Muhammadiyah ijtihad products to address the impacts of COVID-19. In this endeavour,	- Comic, based on Islamic preaching as an interactive media

[26]Yasri and Suyadi, "Arabic Language Learning Strategies Based on Neuroscience: Arabic Language Learning Strategy Based on Neuroscience."

[27]E. A. Purnomo, B Dalyono, and E. D. Lestariningsih, "Developing E-Learning Media on Education Statistics Subject," *Journal of Physics: Conference Series* 1918, no. 4 (June 1, 2021): 042116, https://doi.org/10.1088/1742-6596/1918/4/042116.

[28]Rena Octaviana, Nurhaty Purnama Sari, and Fenny Agustina, "Development of Echinoderm Comic as Learning Media in Junior High School," *Research and Development in Education* 1, no. 2 (December 31, 2021): 98–104, https://doi.org/10.22219/raden.v1i2.18978.

[29]Nevy Farista Aristin et al., "3D Map of Dry Land Use Based Aerial Image as Learning Media in Era of Education 4.0," *International Journal of Emerging Technologies in Learning (IJET)* 15, no. 07 (April 8, 2020): 171, https://doi.org/10.3991/ijet.v15i07.13327.

[30]Suyadi, Zalik Nuryana, and Niki Alma Febriana Fauzi, "The Fiqh of Disaster: The Mitigation of Covid-19 in the Perspective of Islamic Education-Neuroscience," *International Journal of Disaster Risk Reduction* 51 (December 1, 2020): 101848, https://doi.org/10.1016/j.ijdrr.2020.101848.

Researcher Name	Research Title	Discussion	Developed media
		Muhammadiyah provided solutions and actively participated in various spheres, including medical initiatives, religious practices, and educational efforts, to combat the pandemic.	
Novita, Harahap [31]	Development of Interactive Learning Media for Computer System Subjects in Vocational High Schools.	*Development of Interactive Learning Media for Computer System Subjects in Vocational Schools*. The advancement of Information and Communication Technology (ICT) introduced various software designed for the creation of interactive learning media. An initial survey on the implementation of computer system education showed the absence of interactive learning media in the teaching practice. The research used Adobe Director software to develop interactive learning media. The facilities and ICT infrastructure, such as computers, LCD projectors, and the internet, were available in SMKN 3 Pariaman. However, their usage was observed to be suboptimal. The results showed that the interactive learning media developed was valid based on the assessment of the validators. Practicality was ascertained through meticulous teacher and student feedback, as well as classroom observations. These collective results indicated	- Adobe Director - Computers - Projector

[31]Rini Novita, and Syaiful Zuhri Harahap, "Development of Interactive Learning Media for Computer System Subjects in Vocational High Schools," *Informatika* 8, no. 1 (January 28, 2020): 36–44, https://doi.org/10.36987/informatika.v8i1.1532.

Researcher Name	Research Title	Discussion	Developed media
		that the newly developed interactive learning media was pedagogically effective and engaging.	
Ifanov, Jessica, Salim, Syahputra, Suri. [32]	A Systematic literature review on implementation of virtual reality for learning	A Systematic literature review on the implementation of virtual reality as a learning tool has garnered substantial attention. The use of Virtual Reality (VR) as a dynamic learning medium possessed the capacity to engage and interact with users during the learning process effectively.	- Virtual Reality (VR) as a learning medium
Daryanes, Darmadi, Fikri, Sayuti, Rusandi, Situmorang[33]	The development of articulate storyline interactive learning media based on case methods to train students problem-solving ability	The research developed interactive learning media with a clear storyline based on case methods for cellular respiration topics. It also examined students' responses to the interactive learning media and gauged its impact on improving their problem-solving skills. The results indicated that the developed interactive learning media is highly valid.	- Articulate Storyline is software that combines various media into one application and provides feedback to users during the learning process.
Shadiev Wang[34]	A Review of Research on Technology-Supported Language Learning and 21st Century Skills	This research discussed the importance of equipping students with 21st-century skills including critical thinking, creativity, communication, and digital literacy, in addition to knowledge. It conducted an exhaustive review of 34	- Facebook - Google Docs - Moodle

[32]Puti Andam Suri et al., "Systematic Literature Review: The Use of Virtual Reality as a Learning Media," *Procedia Computer Science*, *7th International Conference on Computer Science and Computational Intelligence 2022, 216* (January 1, 2023): 245–51, https://doi.org/10.1016/j.procs.2022.12.133.

[33]Daryanes et al., "The Development of Articulate Storyline Interactive Learning Media Based on Case Methods to Train Student's Problem-Solving Ability."

[34]Rustam Shadiev, and Xun Wang, "A Review of Research on Technology-Supported Language Learning and 21st Century Skills," *Frontiers in Psychology* 13 (July 7, 2022): 897689, https://doi.org/10.3389/fpsyg.2022.897689.

Researcher Name	Research Title	Discussion	Developed media
		articles published between 2011 and 2022, all of which focus on technology-supported language learning and 21st-century skills. The review was centered on six core dimensions, namely research focus, theoretical foundation, technology, learning activities, methodology, and results. The reviewed research predominantly focused on language skills such as speaking and writing and 21st-century skills, including effective communication and collaboration.	

Table shows a collection of researches related to instructional media development from various aspects. Some discussions on instructional media development are closely intertwined with the concept of a universal language. This connection becomes even more apparent while considering the principles of neuroscience, since the media employed acts as a conduit for transmitting knowledge to the brain. In this capacity, it serves as a valuable tool for teachers, aiding them to effectively convey information to learners during the knowledge transfer process. The concept of universal language plays a pivotal role in developing the effective instructional media accessible to everyone without language barriers. It is important to consider the readability and ease of understanding in order to develop instructional media, specifically while catering to the users with diverse linguistic backgrounds.

The leveraging of visual elements including images, animations, and videos emerges as an ideal alternative to clarify the concepts and overcome language limitations. Additionally, the selection of simple and easily understandable words and sentences may also help to enhance the effectiveness of instructional media. It is important to note that the universal language concept proposed by Ibn Sina is not fully realized in practical terms. The concept remains a source of inspiration and guidance for developing instructional media that can seamlessly transcend language barriers and reach a diverse audience.

This highlights the valuable contribution of a universal language to the enhancement of instructional media. A typical example is by using English as a universal medium for teaching foreign languages. Preliminary research reported that incorporating English in this capacity enriches the students' understanding of the subject matter and nurtures their language skills. Additionally, universal language has the significant potential of promoting cross-cultural understanding. It effectively aids the students from varying cultural backgrounds in comprehending the subject matter, thereby promoting an inclusive learning environment.[35]

[35]Rustam Shadiev and Xun Wang, "A Review of Research on Technology-Supported Language Learning and 21st Century Skills," *Frontiers in Psychology* 13 (July 7, 2022): 897689, https://doi.org/10.3389/fpsyg.2022.897689.

Instructional media and the notion of a universal language are closely intertwined. A universal language is a communication conduit that transcends various backgrounds and cultures. Instructional media that adopts a universal language enables diverse audiences to access and understand the conveyed messages or information. This effectively removes the barriers imposed by specific languages or cultural contexts.

In the scope of instructional media, a universal language is concerned with the use of symbols, images, graphics, and visual representations that possesses the inherent ability to be understood and interpreted by individuals, regardless of their specific languages. For instance, the incorporation of intuitive and universally recognized icons or images in instructional media assists the learners from different language backgrounds to grasp the presented content and concepts. This method effectively bridges the language gaps and enhances comprehension among diverse audiences.

5. Conclusion

The current research attempted to discuss the integration between Ibn Sina's universal language theory and neuroscience in the development of learning media. The integration aimed to create a more effective and relevant learning method by using the understanding of universal language and the principles governing human brain learning. Based on the discourse, several results were provided.

The theory proposed by Ibn Sina included concepts, such as signs, meaning as well as the relationship between language and reality. These concepts provided a profound comprehension of the importance of language in thinking, communication, and understanding. The integration of these concepts in the development of learning media may enhance the effectiveness and relevance of the learning method.

Understanding neuroscience, specifically in terms of how the human brain processes information and learns, provided valuable insights into learning media development. By leveraging effective learning principles based on neuroscience results, learning media development was better aligned with cognitive functions and the learning needs of the human brain. The integration of universal language theory and neuroscience in the development of learning media holds great potential for improving learning effectiveness. By considering the delivery of information that aligned with the understanding of universal language and principles of human brain learning, learning media became more engaging, interactive, and optimized comprehension and retention of information.

Examining case studies and real-life examples of incorporating universal language theory and neuroscience into learning media development showed positive outcomes. Challenges were encountered in effectively integrating these concepts. Therefore, more efforts are needed to explore and establish a more comprehensive method for the development of learning media.

The integration of universal language theory and neuroscience in the development of learning media has a potential to heighten the effectiveness, relevance, and efficiency of the learning process. It is important for learning media developers and educational practitioners to consider this integration in order to create a more holistic learning method that aligns with advancements in science and technology. Subsequent research and practical experiments in this field yielded valuable contributions to the future development of education.

Conflict of Interest

Author(s) declare that they have no conflicts of interest.

Funding Details

This research did not receive grant from any funding source or agency.

Bibliography

Ahmed, Husam. "The Role of Visuals in Language Learning and Instructions." March 3, 2019. https://doi.org/10.31185/lark.Vol0.Iss27.395.

Apriani, Minten., and Syahidin Syahidin. "The Ibn Sina Perspective on Education Concept." *Islamic Research* 4, no. 2 (June 25, 2021): 71–80. http://jkpis.com/index.php/jkpis/article/view/78.

Aristin, Nevy Farista., Budijanto Budijanto, Didik Taryana, and I Nyoman Ruja. "3D Map of Dry Land Use Based Aerial Image as Learning Media in Era of Education 4.0." *International Journal of Emerging Technologies in Learning (IJET)* 15, no. 07 (April 8, 2020): 171-179. https://doi.org/10.3991/ijet.v15i07.13327.

Asriyadin, Syahriani Yulianci., Ida Kaniawati, and Winny Liliawati. "Improving Student Character and Learning Outcomes through a Neuroscience Approach Based on Local Wisdom." 2021, 050027. https://doi.org/10.1063/5.0043350.

Chalki, Panagiota., Angeliki Tsiara, and Tassos A Mikropoulos. "An Educational Neuroscience Approach in the Design of Digital Educational Games," n.d.

Ching, Fiona N. Y., Winnie W. M. So, Sing Kai Lo, and Savio W. H. Wong. "Preservice Teachers' Neuroscience Literacy and Perceptions of Neuroscience in Education: Implications for Teacher Education." *Trends in Neuroscience and Education* 21 (December 1, 2020): 100144. https://doi.org/10.1016/j.tine.2020.100144.

Cooper, Joseph J., and Ashley E. Walker. "Neuroscience Education: Making It Relevant to Psychiatric Training." *Psychiatric Clinics of North America*, Medical Education in Psychiatry, 44, no. 2 (June 1, 2021): 295–307. https://doi.org/10.1016/j.psc.2020.12.008.

Daryanes, Febblina., Darmadi Darmadi, Khusnul Fikri, Irda Sayuti, M. Arli Rusandi, and Dominikus David Biondi Situmorang. "The Development of Articulate Storyline Interactive Learning Media Based on Case Methods to Train Student's Problem-Solving Ability." *Heliyon* 9, no. 4 (April 2023): e15082. https://doi.org/10.1016/j.heliyon.2023.e15082.

Erickson, K. "Health Neuroscience: Defining a New Field." 2015. https://www.semanticscholar.org/paper/Health-Neuroscience%3A-Defining-a-New-Field-Erickson/8bce272983a612601d65438815f595d4f145841b.

Fauzi, Muhammad Ilfan. "Utilizing Neuroscience in the Design and Development of Arabic Language Curriculum." *Arabiyatuna: Jurnal Bahasa Arab* 4, no. 1 (2020): 1–20. https://doi.org/10.29240/jba.v4i1.1095.

Glick, Thomas H., and Andrew E. Budson. "Education and Communication about Memory: Using the Terminology of Cognitive Neuroscience." *American Journal of Alzheimer's Disease and Other Dementias* 20, no. 3 (2005): 141–43. https://doi.org/10.1177/153331750502000306.

Gultom, Johannes Jefria. "Utilization of Media in the Teaching and Learning Process," 2016.

Ibn-e-Sina. "*The Pointers and Reminders of Abu Ali Ibn Sina*." Part Two, Third Edition. Corniche Al Nile - Cairo: Dar Al Ma'arif, 1119.

Ibn-e-Sina, and Syihabul Furqon. *Signs and Attention: Logic.* 2020.

Kemp, Kayla M., and David P. Baker. "The Development of Intelligence: Education and Neuroscience." In *Encyclopedia of Behavioral Neuroscience, 2nd Edition (Second Edition)*, edited by Sergio Della Sala, 339-45. Oxford: Elsevier, 2022. https://doi.org/10.1016/B978-0-12-819641-0.00027-X.

Muchtar, Fakhruddin. "The Book of Directives and Remarks" (Bab I, Volume I) 1." 2014. https://www.academia.edu/7568872/AL_ISYARAH_WA_AL_TANBIHAT_Bab_I_Jilid_I_1.

Nurul Fitrahminarsih., Syafruddin Syarif, Mardiana Ahmad, Budu, and Yusring Sanusi B. "Web-Based Learning Media the Skills of Suturing Rupture Perineum of Midwifery Students." *Gaceta*

Sanitaria, The 3rd International Nursing and Health Sciences Students and Health Care Professionals Conference (INHSP), 35 (January 1, 2021): S248–50. https://doi.org/10.1016/j.gaceta.2021.07.017.

Novita, Rini., and Syaiful Zuhri Harahap. "Development of Interactive Learning Media for Computer System Subjects in Vocational High Schools." *Informatika* 8, no. 1 (January 28, 2020): 36–44. https://doi.org/10.36987/informatika.v8i1.1532.

Octaviana, Rena., Nurhaty Purnama Sari, and Fenny Agustina. "Development of Echinoderm Comic as Learning Media in Junior High School." *Research and Development in Education* 1, no. 2 (December 31, 2021): 98–104. https://doi.org/10.22219/raden.v1i2.18978.

Prasetia, Senata Adi., Arif Ainur Rofiq, Rezki Perdani Sawai, and Joki Perdani Sawai. "Ibn Sinā's Psychology: The Substantiation of Soul Values in Islamic Education." *At-Tarbiyah: Journal of Islamic Culture and Education* 7, no. 2 (2022): 171–89. https://doi.org/10.18326/attarbiyah.v7i2.171-189.

Purnomo, E A., B Dalyono, and E D Lestariningsih. "Developing E-Learning Media on Education Statistics Subject." *Journal of Physics: Conference Series* 1918, no. 4 (June 1, 2021): 042116. https://doi.org/10.1088/1742-6596/1918/4/042116.

Shadiev, Rustam., and Xun Wang. "A Review of Research on Technology-Supported Language Learning and 21st Century Skills." *Frontiers in Psychology* 13 (July 7, 2022): 897689. https://doi.org/10.3389/fpsyg.2022.897689.

Suri, Puti Andam., Muhammad Edo Syahputra, Ahmad Syauqy Hilmi Amany, and Affan Djafar. "Systematic Literature Review: The Use of Virtual Reality as a Learning Media." *Procedia Computer Science*, 7th International Conference on Computer Science and Computational Intelligence 2022, 216 (January 1, 2023): 245–51. https://doi.org/10.1016/j.procs.2022.12.133.

Suyadi, Zalik Nuryana., and Niki Alma Febriana Fauzi. "The Fiqh of Disaster: The Mitigation of Covid-19 in the Perspective of Islamic Education-Neuroscience." *International Journal of Disaster Risk Reduction* 51 (December 1, 2020): 101848. https://doi.org/10.1016/j.ijdrr.2020.101848.

Vebrianto, Rian., and Kamisah Osman. "The Effect of Multiple Media Instruction in Improving Students' Science Process Skill and Achievement." *Procedia - Social and Behavioral Sciences*, 3rd World Conference on Educational Sciences - 2011, 15 (January 1, 2011): 346–50. https://doi.org/10.1016/j.sbspro.2011.03.099.

Wathon, Aminul. "Neuroscience in Education." Journal Lentera: Studies on Religion, Science, and Technology 13, no. 2 (September 15, 2015): 236–45. http://ejournal.kopertais4.or.id/mataraman/index.php/lentera/article/view/1324.

Yaden, David., and Theresa Rogers. "Volume 10: Literacies and Languages Education." In *International Encyclopedia of Education (Fourth Edition)*, edited by Robert J Tierney, Fazal Rizvi, and Kadriye Ercikan, xix–xxiv. Oxford: Elsevier, 2023. https://doi.org/10.1016/B978-0-12-818630-5.02010-8.

Yasri, Akhsani Sholihati., and Suyadi Suyadi. "Arabic Language Learning Strategy Based on Neuroscience." *Insyirah: Jurnal Ilmu Bahasa Arab Dan Studi Islam* 5, no. 2 (December 14, 2022): 104–17. https://doi.org/10.26555/insyirah.v5i2.5783.

Zahwa, Feriska Achlikul., and Imam Syafi'i. "Selection of Information Technology-Based Learning Media Development." *Equilibrium: Jurnal Penelitian Pendidikan Dan Ekonomi* 19, no. 01 (January 29, 2022): 61–78