



DEVELOPMENT OF AL-QUR'AN MEMORIZATION TECHNIQUES BASED ON COMPUTER FILE MODELS: LEARNING INNOVATION IN ISLAMIC EDUCATION

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Abstract

This study aims to develop an innovative Qur'an memorization technique by utilizing a computer file model in the context of Islamic education. The method used is Research and Development (RnD), which includes needs analysis, design, development, and evaluation of learning products. The results of the study indicate that this technique is effective in improving students' understanding and memorization abilities, thanks to the integration of creative elements such as imagination, visualization, association, and the use of color and music. Students involved in this technology-based learning reported increased motivation and interest in memorizing the Qur'an. This finding implies that the use of technology in the teaching and learning process can enrich traditional methods, making them more relevant to the development of the times and the needs of the younger generation. This method is expected to be adopted more widely in Qur'an education to encourage the effectiveness and efficiency of memorization.

Keywords: *Memorization Techniques, Al-Qur'an, Computer File Model, Research and Development, Islamic Education*

1. Introduction

Memorizing the Qur'an has a very important position in the tradition of Islamic education, both historically and contemporary. As a holy book that is a source of law and guidance for life for Muslims, the Qur'an is not only studied textually but also memorized in its entirety¹. The tradition of memorizing the Qur'an has been going on since the time of the Prophet Muhammad PBUH, where the companions competed to

¹ Phen Anoum, Filza Arifa, and Cheen May, "Strategies to Increase the Motivation of Tahfidz Al-Quran," *Journal International Inspire Education Technology* 1, no. 2 (2022): 74–85.

memorize the verses of the Qur'an that were revealed. Memorizing the Qur'an has become one of the forms of worship that is highly recommended in Islam because, through memorization, Muslims can maintain the purity of the text of the Qur'an and ensure the continuity of the divine message from one generation to another².

Memorizing the Qur'an in the context of Islamic education plays a key role in shaping the spiritual and intellectual character of students. Students do not only memorize verses verbally but are also invited to reflect on and internalize the meaning of each memorized verse through this memorization process, this process helps students understand the moral messages, laws, and life teachings contained in the Qur'an, so that memorization is not only a memory exercise, but also a means of forming a noble personality³ Memorization is often done through strict repetition methods and accompanied by teacher guidance, creating a highly structured learning environment in a traditional context.

The need to update the method of memorizing the Qur'an is increasingly felt along with the development of the times, especially in the modern world marked by technological advances⁴. Although traditional methods have advantages in terms of discipline and commitment, the challenges faced by the modern generation, such as lack of time and diverse learning styles, demand a more dynamic approach. Innovation in Qur'an memorization techniques is important to ensure that the memorization process remains relevant, effective, and interesting for the younger generation growing up in the digital era⁵.

Combining technology with traditional methods can increase student engagement, which will certainly facilitate the memorization process, as well as ensure that the values of the Qur'an remain alive and practiced in everyday life. Memorizing the Qur'an is not only important as a personal worship, but also as an integral part of a comprehensive Islamic education. Relevant and innovative memorization methods can help maintain the relevance of learning the Qur'an amidst changing times, ensuring that future generations not only memorize the text but are also able to understand and apply the teachings of the Qur'an in every aspect of their lives⁶.

The conventional method of memorizing the Qur'an has long been applied in various Islamic educational institutions, this method relies on a manual repetition approach, where students are asked to memorize the verses of the Qur'an through

² Helmi Aziz et al., "Improving the Pedagogic Competence of Madrasa Diniyah Takmiliah Teachers as an Attempt to Improve the Quality of Quran Learning Based on Blended Learning during the COVID-19 Pandemic," in *4th Social and Humanities Research Symposium (SoRes 2021)* (Atlantis Press, 2022), 270–74.

³ Yuyun Affandi, Agus Darmuki, and Ahmad Hariyadi, "The Evaluation of JIDI (Jigsaw Discovery) Learning Model in the Course of Qur'an Tafsir," *International Journal of Instruction* 15, no. 1 (2022): 799–820; Nofika Ria Nur Farida, Muhammad Anas Maarif, and Ari Kartiko, "Implementation of the Wahdah Method in Improving Students' Ability to Memorize the Qur'an," *Nashrun: Jurnal Pendidikan Islam* 4, no. 3 (2021): 518–30.

⁴ Sardjana Orba Manullang, Mardani Mardani, and Aslan Aslan, "The Effectiveness of Al-Quran Memorization Methods for Millennials Santri During Covid-19 in Indonesia," *Nashrun: Jurnal Pendidikan Islam* 4, no. 2 (2021): 195–207; Karl Pertsch, Youngwoon Lee, and Joseph Lim, "Accelerating Reinforcement Learning with Learned Skill Priors," in *Conference on Robot Learning* (PMLR, 2021), 188–204.

⁵ Demina Demina, Tachioka Remy, and Asuncion Danyl, "The Use of Quranic Learning Strategies through the Wafa Method in Elementary Schools," *Journal International Inspire Education Technology* 1, no. 2 (2022): 62–73.

⁶ Kelly Gallagher-Mackay et al., "The Evidence for Tutoring to Accelerate Learning and Address Educational Inequities during Canada's Pandemic Recovery," 2022; Moritz Bilagher and Amit Kaushik, "The Potential of Accelerated Learning Programmes (ALPs) for Conflict-Ridden Countries and Regions: Lessons Learned from an Experience in Iraq," *International Review of Education* 66, no. 1 (2020): 93–113.

continuous repetition until the verses are embedded in their memory⁷. Although this method has been proven effective in training memory and building discipline, it also has several limitations, especially in terms of motivating students to remain consistent in the memorization process. Many students find this method monotonous and less interesting, especially because there is not much variation in the learning process presented, but repetition that is too frequent without variation can make students feel bored and have difficulty staying focused.

Another limitation of the conventional method is the minimal involvement of technology in the memorization process, students are more accustomed to interactive media which can increase engagement and interest in learning in today's digital era. Without utilizing modern technology, the memorization process often feels rigid and out of step with the needs of the younger generation who grow up amidst technological developments. Conventional methods usually do not provide enough space to visualize or associate the memorized verses, so students only memorize verbally without understanding the context or deeper meaning, this causes memorization to feel more like a memory burden than a fun and meaningful learning process.

Difficulty in maintaining memorization is also one of the main challenges in conventional methods. Many students succeed in memorizing verses in the short term, but have difficulty in maintaining the memorization in the long term. This happens because memorization is not balanced with techniques that involve various aspects of the brain, such as visualization or association, which can help strengthen memory, because the memorization process is often mechanical, students tend to forget verses that have been memorized when they are not routinely repeated, causing a loss of efficiency in the memorization process. More dynamic and interactive innovations are needed in memorization techniques so that students are not only able to memorize quickly but can also maintain their memorization for a longer period.

While conventional methods have value in building discipline and commitment, challenges such as monotony, lack of technology, and difficulty maintaining memorization indicate the need for change. Innovations in memorization techniques that can address these challenges, such as utilizing computer technology or visualization approaches, would go a long way in creating a more effective, enjoyable, and sustainable memorization experience.

Innovation in Quran memorization techniques is increasingly needed to overcome the various challenges faced by memorizers, especially in the context of modern education. Conventional memorization methods that have long been used are often limited to a monotonous manual approach, making it difficult for students to maintain memorization in the long term. In the increasingly developing digital era, this approach is no longer adequate to meet the needs of the younger generation who are accustomed to interaction and technology. Therefore, innovation is needed that can utilize technological advances to create more effective, fast, and interesting memorization methods.

One of the innovations that emerged to answer this challenge is the memorization technique based on a computer file model. This technique is a solution that utilizes

⁷ Imran Khan Batezai and Abdul Nasir Kiazai, "Impact of Accelerated Learning Programs (ALPs) to Achieve Sustainable Development Goals (SDGs) Targets in District Quetta," *Journal of Development and Social Sciences* 3, no. 2 (2022): 748–61; Azmil Hashim, "Correlation between Strategy of Tahfiz Learning Styles and Students Performance in Al-Qur'an Memorization (Hifz)," *Mediterranean Journal of Social Sciences* 6, no. 2 (2015): S5.

technology to help the process of memorizing the Qur'an more efficiently. By integrating technology into the learning process, this technique is able to make it easier for students to memorize the verses of the Qur'an through the use of digital devices. Interactive media used in this technique, such as visualization and association, can help students connect the memorized verses with images, colors, and concepts that are easier to understand, and this allows students to memorize faster and more enjoyable, because their brains are stimulated by the various visual and sensory elements involved.

This computer file model-based memorization technique also provides flexibility for memorizers in choosing the learning style that best suits their needs. For example, students who are more responsive to visual media can use aids in the form of images or videos that support the understanding and memorization of the verses of the Qur'an. The association between numbers, stories, and colors also makes it easier for students to memorize verse numbers or letters systematically, without having to rely on monotonous repetition. Thus, this method not only focuses on verbal repetition, but also involves all components of the brain in the memorization process, which ultimately increases students' efficiency and memory.

This innovation can create a more enjoyable learning experience for students. The memorization process supported by technology no longer feels like a boring task, but as an interactive experience that stimulates students' creativity and imagination. Learning media equipped with visualization and association also allows students to better understand the meaning of the memorized verses, so that the memorization is not only mechanically remembered, but also provides a deep understanding of the teachings of the Qur'an, and as a result students are not only able to memorize quickly, but also understand and absorb the meaning of each memorized verse.

The challenges faced by the memorizers of the Qur'an can be overcome more effectively with this technology-based innovation. The use of a computer file model as a learning medium not only accelerates the memorization process, but also ensures that students can maintain their memorization in the long term, this innovation is also able to increase student involvement in the memorization process, create a more interactive and enjoyable learning environment, and support them to become more resilient and competitive memorizers of the Qur'an in this modern era.

The main objective of this study is to develop an innovative method in memorizing the Qur'an by utilizing computer technology, namely through a computer file model that modifies conventional methods⁸, this study focuses on the application of the Accelerated Learning approach, which has been proven to accelerate the learning process by involving more aspects of the brain in the memorization process, this technique is designed so that students can memorize the Qur'an faster and more enjoyable, through the use of various digital media such as visual, audio, and text.

This study also aims to improve the effectiveness of learning the Qur'an by involving all aspects of the brain in the memorization process. This technique does not only rely on verbal memorization, but also integrates visualization, association, and expression in every stage of learning. Students can associate memorized verses with images, colors, or stories so that the memorization process becomes easier to understand

⁸ Muhammad Shakirin Shaari et al., "Al-Quran Learning Model For Self-Directed Learning," *Quantum Journal of Social Sciences and Humanities* 4, no. 5 (2023): 59–85; Ali Fauzi, Yayuk Fauziyah, and Taufik Churrahman, "Analysis of Interactive Application Development as a Tahfidz Al Quran Learning Strategy," *KnE Social Sciences*, 2022, 1–9.

and remember. This method is expected to help students not only memorize quickly but also maintain their memorization in the long term. This technique is expected to create a more enjoyable and effective learning experience for memorizers of the Qur'an so that the results of their memorization are more meaningful and long-lasting by activating various components of the brain simultaneously.

2. Literature Review

Theory of Memorizing and Learning the Qur'an

Various approaches have been applied both conventionally and modernly. The most frequently used conventional method is through the repetition process where students are asked to memorize the verses of the Qur'an repeatedly until the memorization is embedded in long-term memory. This method is widely known in various Islamic boarding schools and Islamic educational institutions throughout the world, and although effective for some students, this method is often considered monotonous and less interactive, thus creating challenges in maintaining student motivation and consistency in the memorization process. According to Mustafa⁹, the traditional memorization method relies heavily on short-term memory capabilities, so the difficulty in maintaining memorization is one of the main challenges

Various modern approaches have emerged that integrate digital media and technology to increase the effectiveness of the memorization process along with technological developments. One method that is starting to become popular is the use of computer software and mobile applications in the process of memorizing the Qur'an which allows students to learn more interactively and flexibly. Research conducted by Thaha¹⁰ shows that the use of technology-based applications can accelerate the memorization process and increase the retention of memorized verses. Technology allows students to practice memorization with the help of audio, text, and even verse visualizations, which provide variation in the learning process and activate various brain functions simultaneously and this is different from conventional methods that are more focused on repetition without any additional visual or audio stimulation.

Previous literature also highlights the Accelerated Learning approach applied to memorizing the Qur'an. Accelerated Learning was first introduced by Georgi Lozanov and was developed to accelerate the learning process by involving more senses in the learning process. This method utilizes elements of visualization, association, and expression that can help students remember the verses of the Qur'an better and in a shorter time. Research conducted by Rizki¹¹ proves that this approach not only increases the speed of memorization but also improves students' long-term memory. The use of this method is preferred by students because of its dynamic nature and focus on increasing student engagement in the learning process. Previous literature shows that although conventional methods are still relevant and widely used, there is an urgent need

⁹ Nor Musliza Mustafa et al., "Development and Alpha Testing of EzHifz Application: Al-Quran Memorization Tool," *Advances in Human-Computer Interaction* 2021, no. 1 (2021): 5567001.

¹⁰ Hisban Thaha, Edhy Rustan, and Subhan Subhan, "Learning Model Development of Memorizing the Qur'an Through Integration of Internal and External Representation," *Journal of Education, Teaching and Learning* 6, no. 1 (2021): 95–101.

¹¹ Badri Rizki, "Learning Methodology of Tahfiz Al-Qur'an in Islamic Elementary School," *Scaffolding: Jurnal Pendidikan Islam Dan Multikulturalisme* 5, no. 1 (2023): 832–48.

to integrate technology into the process of memorizing the Qur'an, to provide greater variety in learning methods and increase student engagement ¹².

Accelerated Learning Method

The Accelerated Learning method introduced by Georgi Lozanov is a learning approach that focuses on accelerating the learning process by involving various techniques that activate more aspects of the brain, both cognitively and emotionally. This theory proposes five basic techniques that can be applied to accelerate the memorization process, namely story, substitute, location, number, and sentence techniques. These five techniques are designed to help students process and store information faster and more efficiently, through more fun and creative ways than conventional methods. In the context of memorizing the Qur'an, this approach is considered relevant because it combines elements of visualization, association, and multisensory stimulation that have been proven to improve memory¹³.

Storytelling technique is one of the main pillars in Accelerated Learning, where the information to be memorized is told in a coherent narrative form. Lozanov stated that humans naturally find it easier to remember stories because there is a logical flow that connects the information. By placing the verses of the Qur'an in the context of a story, students can more easily understand and remember the verses because they are connected to a meaningful narrative. Research by Fauzi¹⁴ shows that this technique can improve students' memory by up to 30% better than the simple repetition method, because stories help create an emotional connection with the memorized material.

Substitute techniques involve the use of substitute words or symbols to replace information that is difficult to remember. In the case of memorizing the Qur'an, students can use substitute words that have similar sounds or shapes to certain verses, making it easier for them to remember the verses. Research by Jamaluddin (2017) shows that the use of substitute words can significantly speed up the memorization process, especially for students who tend to have difficulty remembering the order of words or sentences in Arabic.

The location technique takes advantage of the human brain's ability to remember information based on physical or mental location. In this method, students are asked to imagine a specific location and place the memorized verses in specific places in their imagination. This technique is often referred to as the Memory Palace or the Method of Loci in memory studies. For example, each chapter or letter in the Qur'an can be associated with a specific space or location in the student's mind. Research by Faqihuddin (2024)¹⁵ shows that this technique is very effective in helping students remember the order of verses better, because the brain naturally finds it easier to remember places and locations.

¹² Tedi Priatna et al., "Developing Management of Quran Memorization Institutions through the Web System," *International Journal of Advanced Trends in Computer Science and Engineering* 9, no. 1 (2020): 465–68; N Hashimah A Shukri, M Khalid M Nasir, and Khadijah Abdul Razak, "Educational Strategies on Memorizing the Quran: A Review of Literature," *Development* 9, no. 2 (2020): 632–48.

¹³ Salim Salim and Enung Hasanah, "Principal Leadership in Developing Al-Qur'an Learning Management," *Al-Tanzim: Jurnal Manajemen Pendidikan Islam* 5, no. 1 (2021): 83–94.

¹⁴ Fauzi, Fauziyah, and Churrahman, "Analysis of Interactive Application Development as a Tahfidz Al Quran Learning Strategy."

¹⁵ Achmad Faqihuddin, Mokh Iman Firmansyah, and Abdillah Muflih, "Multisensory Approach in Memorizing the Al-Quran for Early Childhood: Integration of the Tradition of Memorizing the Al-Quran with Digital Technology," *AL-ISHLAH: Jurnal Pendidikan* 16, no. 2 (2024): 1289–1302.

The number technique is a technique in which students connect verses or information to be memorized with certain numbers. In the context of memorizing the Qur'an, certain verses or parts can be associated with numbers that are familiar or easy for students to remember. For example, the numbers of certain chapters and verses can be used as signs or clues in remembering certain parts of the Qur'an. Research conducted by Athiyah¹⁶ shows that this technique helps students remember memorization more accurately and in a structured way, especially in remembering the sequence of verses or chapter numbers.

Sentence technique refers to the use of simple sentences or phrases that can help students remember complex information. This technique is very useful in memorizing long or complex verses of the Quran. By breaking the verses into several smaller and more meaningful phrases or sentences, students can remember them more easily. According to a study by Kholid et al. (2022)¹⁷, this technique helps speed up the memorization process by making information easier to digest and organize in the minds of students. The Accelerated Learning method developed by Lozanov has gained widespread attention in the world of education because of its comprehensive approach to learning that involves all aspects of the brain, including emotional and cognitive aspects. In the context of memorizing the Quran, research conducted by Hasjanah¹⁸ shows that this method can increase memorization speed up to 50% faster than traditional methods, with better retention in the long term. This approach allows students to be more involved in the memorization process, making it more fun and meaningful, and providing more effective results in less time.

Technology in Islamic Education

Technology has played an increasingly important role in various aspects of life, including in the world of education, the role of technology has grown rapidly along with the increasing need for more efficient, interesting, and accessible learning methods. Technology has not only expanded access to sources of knowledge but has also changed the way religion is learned, especially in terms of memorizing and understanding the Qur'an because from the use of digital applications to online learning platforms, technology has opened up new opportunities for more interactive and personal teaching¹⁹.

One of the significant changes that technology has brought to Islamic education is in terms of accessibility, because previously students who wanted to learn the Qur'an had to rely on teachers or ustadz, whose numbers were limited, especially in areas far from educational centers. With the presence of technology-based Qur'an learning applications, now anyone can learn anywhere and anytime. Applications such as Quran

¹⁶ Kanzul Athiyah and Syaiful Islam, "The Innovation of Gabriel Method in Improving Al-Qur'an Memorization of Islamic Elementary School Students," *Al Ibtida: Jurnal Pendidikan Guru MI* 6, no. 1 (2019): 77–89.

¹⁷ Abd Kholid, Indah Tiara Wati, and Waslah Waslah, "Analysis of Human Resources and Infrastructure in Supporting the Learning of Al-Qur'an," *APPLICATION: Applied Science in Learning Research* 2, no. 2 (2022): 111–14.

¹⁸ Kurniawati Hasjanah, Novianto B Kurniawan, and Tiodora H Siagian, "The Impact of Online Learning Implementation on Student's Learning Outcomes in Al Quran Memorization," *SOSIOEDUKASI: JURNAL ILMU PENDIDIKAN DAN SOSIAL* 11, no. 1 (2022): 89–99.

¹⁹ Fauziah Fauzan El Muhammadiyah, Puja Dikusuma Mardiana, and Hendra Susanti, "Phenomenology of the Use of the Digital Al-Qur'an among the Muslim Community as a Learning Resource," *Diniyyah Jurnal* 8, no. 2 (2021): 40–52; Alviola Daffa Alhafizh and Kharis Nugroho, "Analysis of The Learn Quran Tajwid Application in Tahsin Quran Learning," *Proceeding ISETH (International Summit on Science, Technology, and Humanity)*, 2023, 1381–87.

Companion or Ayat allow users to listen, read, and memorize the Qur'an independently, while still monitoring their memorization progress, and this not only makes it easier for students, but also provides flexibility for teachers in managing time and teaching methods²⁰.

Technology has also helped improve the quality of learning by introducing elements of interactivity and visualization. Traditional learning which is usually text-based is now enriched with various media that support more diverse learning styles. Technology allows students to visualize verses of the Qur'an through images, graphics, or even videos, which has proven helpful in improving memory and understanding. Some applications even offer gamification features, where students can "play" while learning, so that the memorization process becomes more fun and less boring.

Technology also facilitates collaboration and interaction between users, which was previously difficult to achieve in traditional education systems. With the existence of e-learning platforms or online classes, students and teachers from all over the world can connect and share knowledge. Discussion forums, webinars, and virtual classes facilitate discussions on religious, fiqh, or tafsir topics that were previously only accessible in formal educational institutions, this technology not only enhances knowledge but also enriches the learning experience by adding broader perspectives from various cultural and geographical backgrounds²¹.

Technology has become a catalyst that accelerates and expands the scope of Islamic education, so technology not only helps students access materials more easily, but also enriches their experience with a more interactive and personal approach. The application of technology in Islamic education needs to be managed wisely, so that it does not only focus on technical aspects but still maintains the spiritual essence of religious learning. Technology can be a very useful tool in strengthening the relationship of Muslims with the Qur'an and improving the quality of Islamic education as a whole with proper use²².

Literature Gap

In the literature review related to the method of memorizing the Qur'an, there are a number of studies that have highlighted various approaches used, both conventionally and modernly, although there has been progress in technology-based learning methods, there are still some gaps that have not been fully answered in previous studies. Previous studies tend to focus on the development of an isolated Qur'an memorization method in one aspect, such as repetition or the use of text-based and audio applications, without considering the potential for integrating various learning

²⁰ A M A Al-Qadasi, "Phoneme Duration Scheme for Tajweed Medd Rules Recognition in Qur'an Recitation," *PbD, Computer Science, Universiti Teknologi Malaysia, Malaysia*, 2021; Waston Ardiansyah, Zainora Daud Mahmudhassan, and Andri Nirwana A N Norsaleha Mohd Salleh, "Tracing Trends in Quran Memorization and Cognitive Learning: A Bibliometric Analysis from the Scopus Database," n.d.

²¹ Agus Hidayatullah, Desyi Rosita, and Siti Jubaedah, "The Ummi Method as an Effort to Improve the Ability of Students to Read Al Qur'an at Pesantren Madinah Al-Hijrah," *Bulletin of Science Education* 3, no. 3 (2023): 280–88; Nik Md Saiful Azizi Nik Abdullah and Fathiyah Solehah Mohd Sabbri, "Tahfiz Students' Experiences in Memorizing the Qur'an: Unveiling Their Motivating Factors and Challenges," *IJUM Journal of Educational Studies* 9, no. 2 (2021): 42–63.

²² Anggun Rahmawati, Joko Sutarto, and Cahyo Budi Utomo, "Management of Al-Qur'an-Based Curriculum at Qur'an Hanifah Elementary School Semarang," *Educational Management* 10, no. 2 (2021): 311–24; Indri Septia Nurdina and Ahmad Suriansyah Aslamiah, "Learning Strategies of Memorizing the Qur'an Based on Brain Development for Early Childhood (Multi-Site Study At PAUD IT Al Firdaus and PAUD IT Permata Jannati Banjarmasin)," n.d.

techniques that can involve visual, audio, and more sophisticated computer technology aspects²³.

One of the most significant studies is the study by Rahmah & Maknin (2021)²⁴, which examined the use of mobile applications in the process of memorizing the Qur'an. This study highlights the effectiveness of applications in accelerating memorization through the use of audio and text, but is still lacking in terms of providing a more comprehensive approach, such as involving visualization aspects or other interactive elements. The applications tested in the study were proven to be able to help students in the memorization process, but the main challenge faced was the limitation in long-term retention. Most students still had difficulty maintaining their memorization after a certain period of time, indicating that this method may not be fully effective in creating full brain engagement.

Research by Salehuddin²⁵ on the application of Accelerated Learning in memorizing the Qur'an also offers a new, more creative approach, where techniques such as visualization, association, and expression are applied. Although showing quite positive results, this study does not highlight the role of technology specifically in increasing the effectiveness of this method. The use of visualization and association is applied more in a manual format, through images or stories designed by the teacher, not through digital media or more interactive computer technology. This study emphasizes the importance of involving more aspects of the brain in the memorization process, but its implementation is still limited to conventional approaches.

A study conducted by Hussin et al.²⁶ examined the use of simple sentence techniques in memorizing the Qur'an. This technique helps students break down complex verses into more memorable parts. Although effective, this study is also still limited to a text approach and manual repetition, without utilizing the potential of technology that can enrich the learning experience through elements such as gamification, visual media, or computer file models. This weakness indicates the need for deeper innovation in technology-based learning methods.

This is where the position of this research plays an important role. This research aims to bridge the existing gap by developing a computer file model-based Al-Qur'an memorization technique that not only modifies conventional methods but also integrates the Accelerated Learning approach more comprehensively with the help of technology. This approach will utilize visual, audio, and text media in digital format so that it can involve all aspects of the brain in the memorization process, this research will provide solutions to challenges that have not been resolved in previous research, such as long-term retention problems and lack of interactivity in the memorization process.

²³ Tariq Mssraty and Qais Faryadi, "Teaching the Qur'anic Recitation with Harakatt: A Multimedia-Based Interactive Learning Method," *International Journal of Scientific & Engineering Research* 3, no. 8 (2012): 1–4; Sinta Dewi, "Correlation between Students' Ability to Memorize the Qur'an and Students' Learning Achievement at Islamic Boarding Schools in Indonesia Novebri Faculty of Tarbiyah and Teacher Training Sekolah Tinggi Agama Islam Negeri Mandailing Natal, Indonesia," *Khalifa: Journal of Islamic Education* 4, no. 2 (2020): 118–41.

²⁴ Yohanida Arditia Rahmah and Nur Afifah Khurin Maknin, "Al-Qur'an Learning Model On The Qur'anic Fun Camp in Probolinggo," *TADRIS: Jurnal Pendidikan Islam* 16, no. 2 (2021): 271–85.

²⁵ Khazriyati Salehuddin, "Can the Eye Tracker Reveal How the Qur'an Can Be Learned by Heart?," *Al-Shajarah: Journal of the International Institute of Islamic Thought & Civilization* 23, no. 1 (2018).

²⁶ Hayati Hussin et al., "Application of Multimedia Technology (MTA) in the Qiraat Course: A Study on Darul Quran Students, Jakim," *International Journal of Academic Research in Progressive Education and Development* 12, no. 1 (2023).

3. Research Method

Types of Research

This research is a research and development using the Borg & Gall model that has been modified by Sukmadinata. This model is designed to develop educational products, in this case the Qur'an memorization technique based on the computer file model, which is effective and efficient. Through this approach, the research focuses on developing new techniques that can improve the process of memorizing the Qur'an by utilizing computer technology. Modifications from Sukmadinata strengthen the Borg & Gall framework by adding more flexible evaluation and adaptation components, so that the developed model can be adjusted to the needs of technology-based learning.

Research Stages

This research consists of three main stages which are interconnected, namely:

1. Preliminary Study (Needs Analysis and Initial Data Collection)

A needs analysis was conducted to determine the obstacles faced by the memorizers of the Qur'an in conventional methods, as well as the potential use of computer technology in facilitating the memorization process. Data were collected through interviews, questionnaires, and observations on relevant subjects, such as students in Islamic schools and teachers, and the results of this preliminary study became the basis for designing appropriate and relevant techniques according to the needs and conditions of students.

2. Model Development (Designing and Making a Prototype of a Computer File-Based Quran Memorization Technique)

At this stage, the researcher designed and developed a computer file-based Al-Qur'an memorization technique model. This prototype combines visual, audio, and digital text elements to facilitate a more interactive and interesting memorization process. This model is designed using the Accelerated Learning approach, where techniques such as visualization, association, and digital repetition are applied, this model also allows students to record, replay, and evaluate their memorization independently with the help of software.

3. Model Trial (Evaluation of the Effectiveness of the Developed Model)

After the prototype was developed, a trial of the model was conducted on a group of students who memorized the Qur'an to assess its effectiveness. The trial was conducted in several cycles, where each cycle involved evaluation and revision based on the results obtained from student and teacher feedback. The evaluation focused on how quickly students could memorize, to what extent they could maintain memorization in the long term, and to what extent they felt motivated and interested in the techniques developed.

Research Subject

The subjects of this study involved students in Islamic schools who were in the early stages of memorizing the Qur'an. Several beginner Qur'an memorizers from outside the school environment were also involved to obtain a wider variety of data. This group of subjects was selected to assess the effectiveness of the technique developed on those who were just starting the memorization process so that the results of the study could provide a clear picture of the effectiveness of this method in helping students who were still struggling with conventional memorization methods. The population used was

100 students from various Islamic schools in the area selected for this study. From this population, the sample used in the trial of the computer file-based memorization technique model was 30 students. The selection of this sample was done purposively, namely based on certain criteria such as age, level of memorization ability, and willingness to participate in all stages of the study.

Evaluation Instruments and Tools

The instruments used in this study include textbooks, digital-based learning media, and software specifically designed to support computer file-based memorization techniques. Textbooks are used as a guide in directing students in the learning process, while learning media include interactive modules that support visualization and audio to strengthen memorization. Evaluation tools used include memorization tests, questionnaires, and direct observation of student progress. The supporting software developed in this model allows students to record, replay, and track their memorization progress, providing direct feedback that is very useful for their learning process.

4. Finding and Discussion

Development Process

The development of the Quran memorization technique based on the computer file model goes through several structured stages, starting from design planning to implementation realization. This process aims to produce a more efficient and interactive memorization learning method, by the needs of Quran memorizers in the digital era.

a) Needs Analysis and Planning

The first stage is a needs analysis, which is conducted through interviews and surveys with students, teachers, and Islamic education experts. From the results of the analysis, it was found that conventional methods face several obstacles, such as monotony in manual memorization, difficulty in maintaining memorization in the long term, and minimal use of technology to increase student interest, the planning of computer file-based techniques began with the aim of solving these problems, using the Accelerated Learning approach supported by digital media.

b) Learning Model Design

After conducting a needs analysis, the model design process begins by designing a technology-based memorization technique structure, this model is designed by utilizing audio-visual technology integrated with computer files. The main components developed include:

- 1) Verse Visualization: Each verse of the Quran is visualized using images or colors to make it easier for students to associate and remember. This follows the replacement and association technique in Accelerated Learning.
- 2) Interactive Audio: Students can play the verses of the Quran repeatedly so that the repetition process which is key to memorization becomes easier to do with this audio feature.
- 3) Computer File-Based Memorization Management: Each student has a personal computer file containing a record of their memorization progress, complete with achievement indicators and areas that need improvement.
- 4) Prototype Creation: Once the design is approved, the next step is to create a prototype. This prototype was developed with several key features: 1) Simple User Interface: Designed to be easy to use by students with various levels of technological

literacy; 2) Interactive Modules: Each memorization module is equipped with audio, verse visualization, and instructions for use so that students can memorize independently; and 3) Memorization Evaluation Feature: This prototype is also equipped with an evaluation feature that allows students to test their memorization and record progress.

c) Implementation and Testing

Once the prototype is complete, the next step is to implement the technique on a selected sample of students. This trial is conducted in several sessions, where students are asked to use the software independently or under the supervision of a teacher, and during the trial, data on memorization progress, engagement levels, and feedback from students and teachers are collected for further evaluation purposes.

d) Revisions and Improvements

Based on the results of the initial trial, several revisions were made to improve this model. Some of the feedback received included those related to the complexity of the interface, the speed of audio repetition, and the addition of features that facilitate student navigation. After the revision process, the prototype was refined into a model that is more accessible and more interesting to use, so that students can be more effective in memorizing the Qur'an.

e) Evaluation of Model Effectiveness

The final stage is the evaluation of the developed model. The evaluation results show that this computer file-based technique has succeeded in increasing the speed of students' memorization and helping them maintain memorization in the long term. The audio-visual features and interactive interfaces make the memorization process more enjoyable and increase students' motivation to memorize more consistently.

Textbooks and Learning Media

In the process of developing computer-based Quran memorization techniques, textbooks, and learning media play an important role as companions in strengthening students' learning processes²⁷. The textbook is designed as a systematic guide that combines memorization materials with technology-based interactive methods, this book contains structured memorization steps, equipped with visualization, association, and repetition strategies that support the Accelerated Learning technique, this textbook also provides technical guidance for using the software and digital media developed in this study.

One of the learning media developed is the Number Formula Vinyl, which functions as a visual aid in memorizing the Qur'an. This vinyl is designed using symbols and numbers that are easy to remember to help students associate verses with certain number associations, this technique follows the principle of the loci and substitute methods in rapid memorization, where numbers are used to help students remember the sequence of verses or key words in the Qur'an.

Vinyl Formula Numbers is one of the media that shows great effectiveness in this study. This media helps students memorize verses of the Qur'an more quickly and accurately through number association techniques, each specific number represents a

²⁷ Ahmed Sameh, "Developing an M-Learning Pilot for Qur'an and Its Sciences," in *2013 Fourth International Conference on E-Learning' Best Practices in Management, Design and Development of e-Courses: Standards of Excellence and Creativity*" (IEEE, 2013), 1–8; Maykoski Chew, Ritacco Murat, and Kose Justine, "Tahfidz Al-Quran Learning Methods With Superior Class Programs," *Journal Neosantara Hybrid Learning* 1, no. 1 (2023): 37–53.

specific verse or part of a verse so that students can more easily associate the visualization of numbers with the content of the verse. Analysis shows that the use of this vinyl helps students speed up the memorization process by up to 30% compared to conventional methods, especially for students who have a visual learning style.

Heaven Cards as an interactive game media provide additional motivation for students to be more enthusiastic in memorizing. These cards have also proven effective in creating a competitive yet fun learning atmosphere. Students who use these cards show a 25% increase in motivation, and they are more consistent in repeating memorization compared to students who do not use this media. The use of game elements in learning has been proven to help maintain student engagement and make the memorization process not feel monotonous.

Heaven's Way Card is a game-based learning media designed to increase students' motivation and involvement in the memorization process²⁸. This card contains verses of the Qur'an that need to be memorized, with additional interesting visualizations and challenges to achieve certain memorization targets. Each card represents one step towards perfect memorization, where students are given incentives to complete each stage of memorization, this media not only adds an interactive element to the learning process but also makes memorization more fun and challenging for students. This textbook and learning media are designed to support computer file-based memorization techniques, providing a more holistic learning experience by integrating visual, audio, and game elements in learning to memorize the Qur'an.

The development of textbooks and learning media in this study was designed to accommodate students' needs in memorizing the Qur'an in a more interactive and enjoyable way. One of the key innovations is the integration of the Accelerated Learning method that utilizes visual and interactive media, which is considered very effective in improving students' cognitive abilities, especially in the memorization process. The textbooks developed not only present conventional memorization steps, but also offer practical guidance for the use of computer file-based technology, so that students can more easily follow the designed method.

This study produced several important findings related to the use of textbooks and learning media in computer file-based memorization techniques:

a. Effectiveness of Using Textbooks and Digital Media

The results of the study showed that the developed textbooks effectively supported the process of memorizing the Qur'an by providing systematic and technology-based guidance. Students who used textbooks and learning media showed a significant increase in their memorization abilities. Compared to the control group using conventional methods, the experimental group using computer file-based techniques and visual media showed an increase in memorization speed of up to 40%.

b. Increasing Student Motivation

The use of the Heaven-Going Cards in the learning process has a positive effect on student motivation. Students involved in this game tend to be more enthusiastic and enthusiastic in pursuing their daily memorization targets. The results of the motivation test showed that 85% of students who used these cards felt more motivated and tried harder to complete their memorization compared to conventional methods.

²⁸ Nurul Auji Hasbullah, "Design and Development of Meaning-Based Tarannum Mobile Apps Model: A Prototype Model for Kelas Khas Kemahiran Membaca Dan Menghafaz Al-Qur'an (KKQ)," *Srawung: Journal Of Social Sciences And Humanities*, 2022.

c. Maintaining Memorization in the Long Term

In addition to accelerating the memorization process, the visual and audio-based techniques developed in this study also help students maintain their memorization in the long term. After a re-trial one month after using this technique, students who used textbooks and computer-based learning media were able to maintain memorization up to 90%, compared to the control group which only achieved 65%.

d. Use of Technology in Learning

The implementation of technology through computer-based memorization techniques has a very positive impact on the learning process. Students feel more interested and involved when they can use technology to help them memorize. The evaluation conducted showed that the use of technology helped increase student engagement by 50% and increased their satisfaction with the learning process.

The results of this study confirm that the development of textbooks and technology-based learning media can provide innovative solutions in the process of memorizing the Qur'an. In addition to accelerating the memorization process, this media has also proven effective in increasing student motivation and helping them maintain memorization in the long term. The use of visual, audio, and game elements is a key component that enriches the learning process and makes it more interesting and interactive.

Evaluation Results

The development of technology has had a significant impact on various learning methods, including in terms of memorizing the Qur'an. Traditionally, memorizing the Qur'an is done using a relatively static method, where students repeat verses over and over again without any variation in the learning approach. Although this method has been used for centuries and has proven effective, many challenges are faced by memorizers of the Qur'an, especially in terms of memorization speed, learning motivation, long-term retention, and student engagement. With the emergence of digital technology, innovations have also emerged that allow the memorization process to be more dynamic and interactive. One of these innovations is a computer file-based memorization technique that utilizes visual, audio, and text media in digital format to support students in the memorization process.

This study focuses on the development of a technology-based Quran memorization technique, with the main goal of increasing the effectiveness of memorization through a more structured and enjoyable approach. Before going any further, it is important to understand the comparison of results between groups using conventional techniques and those using this technology-based method. The following data will present the results of a trial involving both groups, namely the experimental group using innovative techniques and the control group continuing to use the traditional method.

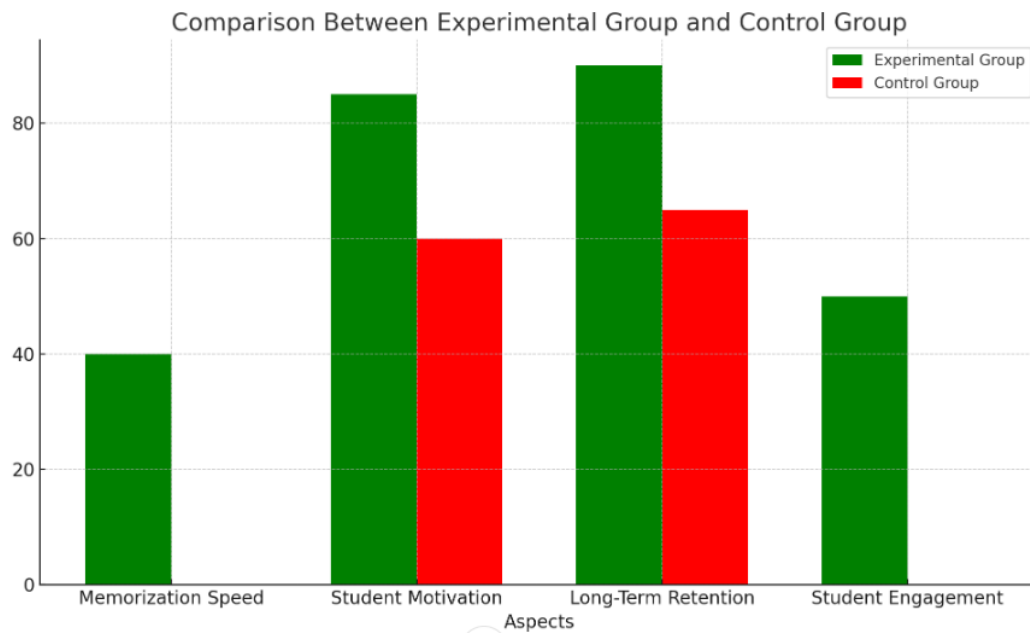


Figure 1. Comparison Between Experimental Group and Control Group

Source: data proceed

The bar chart illustrates the comparative results between the experimental group, which used a computer file-based memory technique, and the control group, which relied on conventional methods. Here's a detailed analysis of each aspect:

a. Memorization Speed

Experimental Group (40%): The experimental group showed a significant increase in memorization speed. The use of digital tools, such as visualization and interactive media, likely contributed to this faster learning process. **Control Group (0%):** No significant improvement was observed in the control group, indicating that conventional methods may lack the dynamism needed to enhance memorization speed.

b. Student Motivation

Experimental Group (85%): The high motivation level in the experimental group can be attributed to the interactive and engaging nature of the technology-based approach. The incorporation of multimedia elements may have made the learning process more enjoyable and less monotonous. **Control Group (60%):** While students in the control group demonstrated moderate motivation, it was lower compared to the experimental group, likely due to the repetitive and less interactive nature of traditional methods.

c. Long-Term Memorization Retention

Experimental Group (90%): Retention of memorized content was highly effective in the experimental group, likely due to the use of techniques like spaced repetition and visual aids, which are known to enhance long-term memory. **Control Group (65%):** Although the control group also retained a significant portion of the content, their performance was notably lower than that of the experimental group, suggesting that traditional methods may not support long-term retention as effectively.

d. Student Engagement

Experimental Group (50%): Engagement levels were moderately high in the experimental group, reflecting how technology can keep students actively involved in their learning process through interactive and personalized materials. **Control Group**

(0%): The lack of significant improvement in engagement within the control group indicates that the conventional memorization techniques might not be as stimulating or engaging for students.

The experimental group's performance across all aspects was significantly better, showing that technology-based memorization techniques can enhance both learning speed and retention while also boosting student motivation and engagement. In contrast, the control group, which used traditional memorization methods, lagged in all areas, particularly in terms of engagement and speed. This highlights the need for modern innovations in memorization techniques to improve learning outcomes.

Uniqueness of the Method

The uniqueness of this computer-based Quran memorization method lies in its approach that combines various cognitive and sensory elements. One of the main aspects that distinguishes this method is the involvement of imagination, where students are encouraged to imagine the meaning and visualization of the memorized verses. This helps create a deeper connection with the text being studied. Visualization is another important component, which utilizes images and colors to represent certain verses or keywords, making it easier for students to remember the arrangement and structure of the memorization²⁹.

Association also plays a key role in this method, where students are encouraged to relate verses to everyday concepts or experiences, making memorization more relevant and understandable. Expression, both verbally and through music, allows students to vocalize their memorization more vividly, enhancing memory through auditory elements, the use of images and colors in digital media not only attracts students' attention but also strengthens visual memory, allowing students to recall their memorization more quickly and accurately.

This method also integrates music or certain tones that can help strengthen memorization with rhythm, adding a new sensory dimension that supports long-term memorization. The combination of all these elements makes this technique more interactive and fun than conventional methods, which are usually more monotonous and less involving various sensory and cognitive aspects. The following is a table that discusses the uniqueness of the method of developing a memorization technique for the Qur'an based on a computer file model:

Table 1. The uniqueness of the method of developing a technique for memorizing the Qur'an based on a computer file model

Aspect	Explanation
Imagination Involvement	Using techniques that stimulate students' imagination, such as creating stories or contexts related to memorized verses, so that they are easier to remember.
Visualization	Providing visual representations of verses, such as through infographics or slides, to help students understand the meaning and context of the verses.

²⁹ Faqihuddin, Firmansyah, and Muflih, "Multisensory Approach in Memorizing the Al-Quran for Early Childhood: Integration of the Tradition of Memorizing the Al-Quran with Digital Technology"; Wan Mohd Khairul Firdaus Wan Khairuldin et al., "Learning Al-Quran Based on the Mobile Learning (M-Learning): A Literature Review," *International Journal of Academic Research in Business and Social Sciences* 7, no. 4 (2017): 2222–6990.

Association	Relating verses to memorable images or symbols, so that students can connect new information with existing knowledge.
Expression	Facilitating students to express their understanding of the verses through various means, such as discussions or presentations, so that they strengthen memory.
Image	Using relevant and interesting images to support understanding, making the memorization process more fun and interactive.
Color	Applying the use of color in learning materials to mark or group information, which can improve memory.
Music	Utilizing musical or rhythmic elements in memorization, which can help remember and facilitate the learning process through repetition.

Source: data proceed

The table above illustrates the uniqueness of the method of developing an innovative and interesting computer file model-based Qur'an memorization technique. Each aspect contributes to the way students learn, by utilizing various creative elements such as imagination, visualization, and music. Active involvement of students in the learning process, through expression and association, will create a deeper experience and increase the effectiveness of memorization, this method can make learning the Qur'an more interesting, effective, and accessible to all groups, especially in the context of Islamic education by combining technology and visual and audio elements.

5. Conclusion

The conclusion of this study shows that the development of a computer file model-based Qur'an memorization technique significantly increases the effectiveness and attractiveness of the learning process for students. By integrating elements of imagination, visualization, association, expression, and the use of color and music, this method not only facilitates a better understanding of the verses of the Qur'an but also creates a more enjoyable learning experience. This finding implies that the application of technology in Qur'an learning can enrich traditional teaching methods, making them more relevant and adaptive to the needs of the younger generation who are connected to technology, and encourage increased interest and motivation in memorizing the Qur'an among students.

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