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Development of Virtual Field Trip-Based Learning Model as A Strengthening of Madrasah Student Digital Literacy

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Abstract

This article aims to determine how the development, feasibility, effectiveness, and practicality of virtual field trip (VFT)-based learning models strengthen students' digital literacy. The research was conducted in three Madrasah Ibtidaiyah (MI) areas of South Jakarta, Bogor (West Java), and Kediri (East Java). The trial was conducted for students (sixth-grade students) in each school in one class. This research uses a qualitative descriptive approach with research and development (R&D) methods, according to Borg & Gall. Research data on the application of the model were obtained through observation, tests, and questionnaires, while data analysis was carried out through average and percent scores. This development research obtained a model design from VFT-based learning steps. Based on the results of the trial revealed that (1) the model met the Feasible criteria shown by the assessment of experts and practitioners with an excellent category; (2) the model met the Effective criteria shown by the average results of strengthening digital literacy with an excellent category, and the average results of positive responses to the implementation of learning with Agree/Happy criteria, as well as the achievement of student learning outcomes from the three trial classes obtained a percentage increase above 5%; (3) the model met the Practical criteria shown by the implementation of learning through VFT and the teacher's ability to manage the learning with an excellent category. The research results briefly state that the VFT-based learning model developed can reinforce students' digital literacy.

Keywords: Learning Models, Virtual Field Trips, Digital Literacy

Abstrak

Artikel ini bertujuan untuk mengetahui bagaimanakah pengembangan, kelayakan, efektifitas dan kepraktisan model pembelajaran berbasis virtual field trip (VFT) sebagai penguatan literasi digital siswa. Penelitian dilakukan pada tiga Madrasah Ibtidaiyah (MI) wilayah Jakarta Selatan, Bogor Jawa barat dan Kediri Jawa Timur. Ujicoba dilakukan kepada siswa kelas VI untuk masing-masing sekolah satu kelas. Metode yang digunakan adalah penelitian R&D dengan mengadopsi disain pengembangan Borgh & Gall. Data penelitian mengenai penerapan model diperoleh melalui observasi, tes, dan angket, sedangkan analisis data dilakukan melalui skor rata-rata dan persen. Dari penelitian pengembangan ini dihasilkan disain model dalam bentuk langkah-langkah pembelajaran berbasis VFT. Berdasarkan hasil ujicoba menunjukkan bahwa, (1) Model memenuhi kriteria Layak yang ditunjukkan oleh penilaian ahli dan praktisi dengan kategori Sangat Baik. (2) Model memenuhi

kriteria Efektif yang ditunjukkan oleh hasil rerata penguatan literasi digital dengan kategori Sangat Baik, dan hasil rerata respon positif terhadap pelaksanaan pembelajaran dengan kriteria Setuju/Senang, serta pencapaian hasil belajar siswa dari ketiga kelas ujicoba diperoleh persen peningkatan di atas 5%. (3) Model memenuhi kriteria Praktis ditunjukkan oleh keterlaksanaan pembelajaran melalui VFT dan kemampuan guru mengelola pembelajaran dengan kategori Sangat Baik. Dari hasil penelitian tersebut disimpulkan model pembelajaran berbasis VFT yang dikembangkan mampu memberikan penguatan terhadap literasi digital siswa.

***Kata Kunci**: Model Pembelajaran, Virtual Field Trip, Literasi Digital*

INTRODUCTION

The rapid development of information technology is part of the emergence of the digital revolution era in Indonesia.[1] Technology development has a huge influence and dominates all sectors of people's lives, not to mention the world of education. In addition, academic demands vary at each level of education.[2] The world of education recognizes the digital age, especially in basic education, to increase student knowledge.[3] In the digital age, educators must improve the quality of learning by utilizing digital media to obtain scientific information and facilitate achieving learning objectives.[4]

Digital media can help present learning materials contextually and audio-visually; thus, learning can occur in an interesting, interactive, and participatory manner.[5] The use of digital media will affect children's cognitive development.[6] Therefore, digital-based learning should be applied at the Madrasah Ibtidaiyah (MI) level to strengthen digital and information literacy.[7] Nowadays, digital learning and access to quality virtual learning are becoming increasingly significant.[8]

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[1] M. Ali Haidar, Mizanul Hasanah, and Muhammad Anas Ma`arif, "Educational Challenges to Human Resource Development in Islamic Education Institutions," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 3, no. 4 (2022): 366–77, https://doi.org/10.31538/munaddhomah.v3i4.309.

[2] Jason T Hilton and Joseph Canciello, "Www.Ijte.Net A Five-Year Reflection on Ways in Which the Integration of Mobile Computing Technology Influences Classroom Instruction A Five-Year Reflection on Ways in Which the Integration of Mobile Computing Technology Influences Classroom Instruction," *International Journal of Technology in Education (IJTE) International Journal of Technology in Education* 1, no. 1 (2018): 1–11.

[3] Vahideh Zolfaghari Mashhadi and Mohammad Reza Kargozari, "Influences of Digital Classrooms on Education," *Procedia Computer Science* 3 (2011): 1178–83, https://doi.org/10.1016/j.procs.2010.12.190.

[4] Laros Tuhuteru et al., "The Effectiveness of Multimedia-Based Learning To Accelerate Learning After The Pandemic At The Basic Education Level," *Tafkir: Interdisciplinary Journal of Islamic Education* 4, no. 1 (March 21, 2023): 128–41, https://doi.org/10.31538/tijie.v4i1.311; Rahmah Fadilah Tanjung, Asnil Aidah Ritonga, and Yahfizham Yahfizham, "The Effect of Using Edmodo Learning Media and Learning Motivation on Fiqih Learning Outcomes," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 3, no. 2 (December 28, 2022): 203–11, https://doi.org/10.31538/munaddhomah.v3i2.266.

[5] Irene Mardiatul Laily, Anita Puji Astutik, and Budi Haryanto, "Instagram Sebagai Media Pembelajaran Digital Agama Islam Di Era 4.0," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 3, no. 2 (December 21, 2022): 160–74, https://doi.org/10.31538/munaddhomah.v3i2.250.

[6] Fran C. Blumberg et al., "Digital Games as a Context for Children's Cognitive Development: Research Recommendations and Policy Considerations," *Social Policy Report* 32, no. 1 (2019): 1–33, https://doi.org/10.1002/sop2.3.

[7] Atikah Syamsi, "Penguatan Literasi Informasi Berbasis Perpustakaan Bagi Peningkatan Mutu Akademik Mahasiswa Pgmi Iain Cirebon," *JURNAL JPSD (Jurnal Pendidikan Sekolah Dasar)* 2, no. 2 (2016): 24, https://doi.org/10.26555/jpsd.v2i2.a5485.

[8] Gustav B. Petersen et al., "The Virtual Field Trip: Investigating How to Optimize Immersive Virtual Learning in Climate Change Education," *British Journal of Educational Technology* 51, no. 6 (2020): 2098–2114, https://doi.org/10.1111/bjet.12991.

Based on initial observations and interviews with teachers conducted at five Madrasah Ibtidaiyah (MI) in the Jakarta, Bogor, and Kediri areas, information was obtained that the teacher had an obstacle to providing understanding to students in certain subjects. It is because the teacher has not been able to demonstrate directly or concretely the material discussed. The new teacher can tell and explain, but many students still feel unsatisfied and incomprehensible.

Developing digital learning is a strategic step in responding to the times.[9] Hence, there is a thought awakened in students that learning is boring because they only listen to lectures and memorize a lot.[10] Teachers should be able to package lecture and memorization methods into learning to create more interesting and easier methods for students.[11]

One alternative learning innovation solution that needs to be developed in face-to-face and online learning and can attract students' attention and attractiveness[12] to strengthen digital literacy is a virtual field trip (VFT).[13] As stated by the author's previous research, researchers developed a field trip model in a face-to-face context, or students came directly to the intended location.[14] However, during the current pandemic, field trip activities are not possible to be carried out as usual,[15] therefore, the field trip program can still be carried out in schools and, indeed, can attract children's motivation in learning; researchers feel the need to develop and calibrate field trips that are only carried out face-to-face to be relevant and can be implemented virtually,[16] certainly, through the role of the digital world.[17]

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[9] Beverly Park Woolf, *Building Intelligent Interactive Tutors for Revolutionizing E-Learning*, *Morgan Kaufmann*, 2010.

[10] Margaret Wolff et al., "Not Another Boring Lecture: Engaging Learners with Active Learning Techniques," *Journal of Emergency Medicine* 48, no. 1 (2015): 85–93, https://doi.org/10.1016/j.jemermed.2014.09.010.

[11] Roy Martin Simamora, "The Challenges of Online Learning during the COVID-19 Pandemic: An Essay Analysis of Performing Arts Education Students," *Studies in Learning and Teaching* 1, no. 2 (2020): 86–103, https://doi.org/10.46627/silet.v1i2.38.

[12] Alfyananda Kurnia Putra et al., "Development of Mobile Virtual Field Trips in Ijen Crater Geosites Based on 3600 Auto Stereoscopic and Geospatial Technology As Geography Learning Media," *Geojournal of Tourism and Geosites* 41, no. 2 (2022): 456–63, https://doi.org/10.30892/GTG.41216-850.

[13] Andrea Stevenson Won, Jakki O. Bailey, and Siqi Yi, "Work-in-Progress-Learning about Virtual Worlds in Virtual Worlds: How Remote Learning in a Pandemic Can Inform Future Teaching," *Proceedings of 6th International Conference of the Immersive Learning Research Network, iLRN 2020*, no. iLRN (2020): 377–80, https://doi.org/10.23919/iLRN47897.2020.9155201.

[14] S.H. Khotimah, A.S. Budi, and M.S. Sumantri, "Field Trip Model to Support Understanding of Mathematical Literacy of Elementary School Students," in *Journal of Physics: Conference Series*, vol. 1170, 2019, https://doi.org/10.1088/1742-6596/1170/1/012082.

[15] Joko Pamungkas, "Identification of Missing Eastern Cultural Values During the Covid 19 Pandemic in Early Childhood Learning," *JPPI (Jurnal Penelitian Pendidikan Indonesia)* 7, no. 3 (2021), https://doi.org/10.29210/020211238.

[16] Lisa Hasenbein et al., "Learning with Simulated Virtual Classmates: Effects of Social-Related Configurations on Students' Visual Attention and Learning Experiences in an Immersive Virtual Reality Classroom," *Computers in Human Behavior* 133, no. October 2021 (2022), https://doi.org/10.1016/j.chb.2022.107282.

[17] Darrell G. Schulze et al., "Virtualizing Soil Science Field Trips," *Natural Sciences Education* 50, no. 1 (2021): 1–13, https://doi.org/10.1002/nse2.20046.

A virtual field trip (VFT) is a simulated expedition taken in a virtual environment without traveling to the actual place.[18] In VFT, students find themselves in a virtual environment to carry out an observation independently. VFT can enable interaction, exploration, active learning, and skill testing.[19]

In addition, the field trip program that has been standing alone has become an outing class or recreation activity. Through this digital technology, the field trip is packaged virtually and included in learning activities in several subject areas.[20] Hence, through VFT, students are expected to be more interested, be actively involved, and contextualize the theme of the lesson being discussed, because considering the characteristics of Madrasah Ibtidaiyah (MI) students who have a high curiosity. Sometimes, the teacher's explanation is not enough and must be added with media that attracts students' attention to simplify an understanding. Vatyca's research[21] categorized VFT as an attractive medium; this can be seen from the results of the student response questionnaire, which obtained a score of 93.3%. Therefore, it concluded that VFT was feasible and attractive to students. Borst et al.'s research[22] stated that teacher-guided VFTs got higher test scores than non-teacher-guided VFTs.

Based on the needs analysis applied in three MI schools in the Bogor and Depok areas related to the VFT's need in learning and the background described above, it is necessary to develop a virtual field trip-based learning model as a strengthening of digital literacy in supporting independent learning. The objective of VFT-based learning is to encourage students to think independently and to be able to access information from anywhere and anytime through instructions prepared by the teacher. Hence, VFT-based learning can liberate students in learning because students can independently explore their abilities.[23] Another objective of implementing VFT-based learning is to reinforce the digital literacy of MI students. Learning presented through the help of computer, laptop, or cellphone technology should be able to be followed well by students[24] because VFT will help students to find out real activities in the field where the subject matter is applied in the community or life through impressions that can be accessed via digital media prepared by teachers and students while

[18] Jing Wen and Masoud Gheisari, "A Review of Virtual Field Trip Applications in Construction Education," *Construction Research Congress 2020: Safety, Workforce, and Education - Selected Papers from the Construction Research Congress 2020*, 2020, 782–90, https://doi.org/10.1061/9780784482872.085.

[19] Petersen et al., "The Virtual Field Trip: Investigating How to Optimize Immersive Virtual Learning in Climate Change Education."

[20] Miro Puhek, Matej Perse, and Andrej Sorgo, "Virtual Field Trip As Tool for Environmental Education," *Edulearn12: 4Th International Conference on Education and New Learning Technologies* 5535, no. March 2015 (2012): 5076–84.

[21] D K Vatyca, "Pengembangan Media Virtual Fieldtrip (VFT) Pada Pembelajaran Ilmu Pengetahuan Sosial Kelas IV," 2021.

[22] Christoph W. Borst, Nicholas G. Lipari, and Jason W. Woodworth, "Teacher-Guided Educational VR: Assessment of Live and Prerecorded Teachers Guiding Virtual Field Trips," *25th IEEE Conference on Virtual Reality and 3D User Interfaces, VR 2018 - Proceedings*, 2018, 467–74, https://doi.org/10.1109/VR.2018.8448286.

[23] A. J. Obadiora, "Comparative Effectiveness of Virtual Field Trip and Real Field Trip on Students' Academic Performance in Social Studies in Osun State Secondary Schools," *Mediterranean Journal of Social Sciences* 7, no. 1 (2015): 467–74, https://doi.org/10.5901/mjss.2016.v7n1p467.

[24] Santi Caballé, Fatos Xhafa, and Leonard Barolli, "Using Mobile Devices to Support Online Collaborative Learning," *Mobile Information Systems* 6, no. 1 (2010): 27–47, https://doi.org/10.3233/MIS-2010-0091.

seeking some references. Through VFT, students' skills in using digital media can also be obtained so that strengthening digital literacy can be observed.[25]

RESEARCH METHOD

This research method employed the research and development (R&D) method; according to Borg & Gall, which describes ten steps or stages. However, in this research and development, the ten steps were modified and simplified into five steps: 1) research and initial information gathering; 2) planning and development; 3) validation and testing; 4) revision of the final product; and 5) dissemination and implementation. Modification and simplification are carried out by researchers based on factors such as time constraints, cost limitations, and the similarity of steps or stages.

The subject of this research and development is students of Madrasah Ibtidaiyah Class VI for the 2022–2023 academic year. The research focused on the virtual field trip-based learning model to strengthen digital literacy by sampling students from three Ibdtidaiyah Madrasahs in the Jakarta City, Bogor (West Java), and Kediri (East Java) areas. In each Madrasah, one class was taken as a trial class. The reason for choosing students in Class VI was because their characteristics are more mature than those of other class levels. Their readiness to receive VFT-based learning is better, and assisting researchers to interact.

Data collection techniques and research instruments can be seen in the following table:

Table 1. Data Collection Techniques and Instruments

Data Type	Data Collection Techniques	Data Results
Quantitative	Tests	- Material test questions on Islamic Cultural History and Aqidah Akhlak, a multiple-choice form of questions with a total of 20 questions
Quantitative	Questionnaires	- Questionnaire sheet of the results of validation of education experts and practitioners (Teachers) on learning models & implementation plans (RPP) - Observation sheet on strengthening students' digital literacy - Learning implementation observation sheet - Questionnaire sheet of student responses to VFT-based learning models
Qualitative	Documentation	- Answer sheets, portfolio assessments, photos of learning activities, and supporting documents from the school

The data analysis used was qualitative and quantitative techniques. Content analysis used data from document review, validation data, and strengthening digital literacy using descriptive statistics, namely averages, and percentages. Data analysis included a) Analysis of data on the level of validity of learning products and tools, b) Analysis of the effectiveness of

[25] Eric M. Meyers, Ingrid Erickson, and Ruth V. Small, "Digital Literacy and Informal Learning Environments: An Introduction," *Learning, Media and Technology* 38, no. 4 (2013): 355–67, https://doi.org/10.1080/17439884.2013.783597.

virtual field trip-based learning models as a reinforcement of digital literacy, and c) Analysis of the practicality of VFT-based learning models.

The observational indicators to strengthen students' digital literacy are:

Table 2. Individual Competence

Individual Ability Category	Level	Indicator
Use Skill	Medium	The research subjects can use digital media and are still in the process of adaptation.
Critical Understanding	Medium	The research subjects can understand the content, functions, and rules of using digital media, but the willingness to cross-check information was lacking.
Communicative Ability	Basic	The research subjects have not been able to communicate and actively participate in learning because they are only at the stage of following instructions.

Adopted from Setyaningsing et al.[26]

RESULTS AND DISCUSSION

Model Development Outcomes

A learning model has a syntax or stages of learning activities that describe how the model works in practice. The syntax design of VFT-based learning models considers behavioristic, cognitive, and constructivist views and is based on learning theory.

Table 3. Syntax and Activities in VFT-based Learning Models

Stages	Teacher Activities	Student Activities
I. Learning Preparation	1. The teacher determined the material to be applied to VFT at the beginning of the semester 2. The teacher determined the learning objectives 3. The teacher determined the location of the VFT 4. The teacher determined/ searched for website references that supported field trip locations 5. The teacher conducted licensing and communication with the intended VFT (if VFT is carried out in collaboration with the location of the field trip) 6. The teacher made a Learning Implementation Plan (RPP) 7. The teacher compiled student worksheets 8. The teacher determined the strategy for implementing VFT. 9. The teacher compiled instructions for the implementation of the virtual field	1. Students knew the VFT theme from the teacher 2. Students received VFT group division from teachers 3. Students received instructions for the implementation of learning that the teacher had made

[26] Rila Setyaningsih et al., "Model Penguatan Literasi Digital Melalui Pemanfaatan E-Learning," *Jurnal ASPIKOM* 3, no. 6 (2019): 1200, https://doi.org/10.24329/aspikom.v3i6.333.

	trip	
II. Implementation of Learning	1. The teacher opened the learning and conveyed the learning objectives 2. The teacher divided students into groups/ independently 3. Teachers prepared digital media 4. Teachers distributed instruction sheets for implementing VFT-based learning to each group or independently 5. Teachers observed student activities and provided assistance and direction for students/ groups who needed explanation 6. The teacher conducted a Q&A with students 7. Teachers provided opportunities for students to discuss and complete assignments with groups/ independently	1. Students sat in groups with digital devices that had been prepared 2. Students followed the VFT guidance instructions contained in the worksheet 3. Students in groups/ independently run digital devices prepared following the technical instructions provided 4. Students carried out VFT and recorded necessary matters 5. Students conducted a Q&A with the teacher after watching the video 6. Students answered worksheets and carried out activities based on instructions in LK digitally
III.Final Learning	1. The teacher confirmed/ evaluated the VFT-based learning that has been carried out	1. Students provided responses to VFT that has been implemented

Model Validity Outcomes

The developed model was validated by four validators consisting of three expert validators and one practitioner. The validated instrument was a VFT-based learning model containing several assessment aspects. Validation was carried out before the model was tested in the field. The Validation results are presented in the table below:

Table 4. Summary of Model Validation Outcomes

Aspect	Expert and Practitioner Assessment				Average	Criteria
	V1	V2	V3	V4		
Supporting Theories	4.0	4.0	3.3	4	3.82	Excellent
Model Structure	4.0	3.8	3.8	3.8	3.85	Excellent
Suitability of Material with Virtual Field Trip Objects	3.8	3.8	3.8	4.0	3.85	Excellent
Desired Learning Outcomes	4.0	4.0	4.0	4.0	4.00	Excellent
Language	4.0	4.0	3.8	4.0	3.95	Excellent
Learning Implementation Plan (RPP)	3.8	3.7	3.7	3.8	3.78	Excellent
Average Total					3.88	Excellent

Based on the validation table of experts and practitioners above, an average total of 3.88 was obtained with excellent criteria. It implies the validity of the VFT-based learning model designed by researchers from several aspects so that the model is feasible and can be applied/ used.

Model Effectiveness

Results of Strengthening Digital Literacy

The achievement of students' digital literacy in the expanded test experienced significant strengthening. The expanded test conducted twice made students more skilled in digital literacy; it can be seen from the increase in scores on the results of observations made by researchers from the first and second tests. A summary of the results of strengthening digital literacy can be seen in the following table:

Table 5. Summary of the Results of Strengthening Student Digital Literacy

	MI Madarijut Thalibin		MI Nurul Huda		MI Miftahul Huda	
	Test 1	Test 2	Test 1	Test 2	Test 1	Test 2
Average	3.50	3.90	3.40	3.83	3.33	3.80
Criteria	Good	Excellent	Good	Excellent	Good	Excellent

Based on the data above, the results of strengthening digital literacy in each Madrasah have increased. In the first test, the average in each school obtained a good category, but in the second test, the trial class obtained excellent criteria. It indicates that students are becoming skilled in digital literacy through habituation in the first and second trials. Hence, according to the observational result, it can be concluded that the level of student ability in digital literacy is based on assessment indicators. The conclusion of the level of digital literacy ability can be seen in the following table:

Table 6. Conclusion of Digital Literacy Ability Level

Individual Ability Categories	Observation Level					
	Madrasah 1		Madrasah 2		Madrasah 3	
	Test 1	Test 2	Test 1	Test 2	Test 1	Test 2
Use Skill	Medium	Medium	Medium	Medium	Basic	
Critical Understanding	Basic	Medium	Medium	Medium	Basic	Medium
Communicative Ability	Medium	Medium	Medium	Medium	Medium	Medium

Student Learning Outcomes

The achievement of Islamic learning outcomes on Islamic Cultural History material as well as Qada and Qadar in the expanded trial applied to three MIs obtained the results of increasing the average score on each test given at each madrasa, and the outcomes can be seen in the following table:

Table 7. Recapitulation of Islamic Religious Subject Test Outcomes

School Name	Average Score		% Increases
	Test 1	Test 2	
MI Madarijut Thalibin	88.00	96.00	8.00
MI Nurul Huda	87.86	94.29	6.43
MI Miftahul Huda	88.17	94.00	5.83

Based on the table above, it can be seen that in each Madrasah, the average first test score has been considered good through the application of VFT-based learning models. Furthermore, to ensure that VFT was effective, researchers still applied the second learning through VFT with different materials and tests. It can be seen in the second test result table that the average score was increasing. The increase in each Madrasah exceeded 5%. Based on observations, it was because students have begun to be skilled in using digital media, understand the process, and can consider the timing of implementation.

Student Activity Outcomes

Observations for student activities in applying VFT-based learning models were carried out by researchers who also act as teachers. The outcomes of student activity analysis of VFT-based learning models are shown in the following table:

Table 8. Student Activity Outcomes in VFT-Based Learning

Student Activity	Observations				Criteria
	1	2	3	4	
Conduct discussions based on cooperative procedures				v	Excellent
Cooperate in finding an answer to the problem given by expressing quality opinions to each other				v	Excellent
Ask questions as a form of curiosity			v		Good
Pay attention to the opinions of other students during discussions				v	Excellent
Respond well to other students' opinions without discriminating against friends				v	Excellent
Get work done on time				v	Excellent
Experiment based on worksheets				v	Excellent
Collect and analyze observational data				v	Excellent
Listen to assignment forms				v	Excellent
Not doing any activity	V				Less
Total Activity	1	0	3	32	
Average			3.60		Excellent

Based on the observations, an average of 3.60 was obtained with excellent criteria. It indicates that students positively respond to virtual field trip-based learning; thus, the model is declared effective.

Student Response Outcomes to the Model

The outcomes of the analysis of student responses from each trial class to the application of the VFT-based learning model are shown in the following table:

Table 9. Summary of Student Responses to the Model

	Average Score		
	MI Madarijut Thalibin	MI Nurul Huda	MI Miftahul Huda
Average	4.50	4.40	4.33
Criteria	Agree	Agree	Agree

Based on the data in the table above, Madrasah students in each school experienced attractive or agreed to VFT-based learning activities. It implies that the VFT-based learning model is effective in its implementation.

Model Practicality

To find out the practicality of the model, observations were made by three teachers during model trials. The results of observations can be seen in the following table:

Table 10. Model Implementation Summary

Observed Aspects	Observer 1	Observer 2	Observer 3	Average	Criteria
Syntax	4.00	3.67	4.00	3.89	Excellent
Social System	4.00	3.67	4.00	3.89	Excellent
Reaction Principle	3.80	3.80	4.00	3.87	Excellent
Support System	4.00	4.00	4.00	4.00	Excellent
Average				3.91	Excellent

Based on the observations of class teachers who were used as *observers* in this research, an average of 3.91 was obtained with excellent criteria. It implies a practical VFT-based learning model in its implementation.

Discussion

Development of virtual field trip-based learning models

The VFT-based learning model is one alternative learning model that teachers can use to improve learning outcomes and simultaneously provide digital literacy strengthening of madrasah students.[27] The learning model has been tested, and the results met the quality criteria: practical and effective to be implemented in learning in Madrasah Ibtidaiyah (MI), especially for Islamic religious studies.

This learning model was developed based on the logic of thinking that in learning Islamic cultural history material and Qada and Qadar, students develop critical thinking skills

[27] Vannisa Aviana Melinda, I Nyoman Sudana Degeng, and Dedi Kuswandi, "Pengembangan Media Video Pembelajaran IPS Berbasis Virtual Field Trip (VFT) Pada Kelas V SDNU Kraton-Kencong," *JINOTEP: Jurnal Inovasi Dan Teknologi Pembelajaran* 3, no. 2 (2017): 158–64.

through the ability to understand various sources of real events and learning objects.[28] In line with the results of research that states critical thinking skills become essential related to thinking characteristics that require focus, logical reasoning, and experience that leads to specific answers so that individuals can be used to ensure that the ideas raised can solve the problems faced.[29] Achieving competencies requires various approaches that allow students to gain experience and feedback directly through learning. The VFT-based learning model provides direct experience to students related to the material learned.

Development of VFT-based learning models as a reinforcement of students' digital literacy, using the basic foundation that everyone will build new forms of knowledge by combining information that comes, then with what has been stored in memory and previous learning outcomes. Applying information technology to learning has become a necessity that must be carried out to meet the demands of the curriculum and the dynamics of the times.[30] Learning activities are no longer only limited to conventional learning, which is limited to classroom contexts. However, it is still maintained and applied, but in today's digital era, the learning process can also be conducted virtually or online.[31]

Learning that motivates students, makes them happy and meaningful, and gives students the freedom to find and express ideas, is one of the hopes of independent learning. In line with the concept of independent learning expressed by Zulfitri et al,[32] an encouraging learning atmosphere can shape learning effectively, where conditions in attractive learning can override inefficient learning, which can result in students not being excited, lazy, and bored.[33] Through VFT, students can surf the digital world to find the needed material. It also gives more enthusiasm when students have or have not previously known digital devices.

Feasibility of virtual field trip-based learning model

VFT-based learning models were developed based on the principles and characteristics of learning in Madrasah Ibtidaiyah (MI) and the characteristics of MI-age students. Based on the validity test, the developed model meets the validity criteria. The results of validity of VFT-based learning models from experts and practitioners obtained

[28] Richard J. Shavelson et al., "Assessment of University Students' Critical Thinking: Next Generation Performance Assessment," *International Journal of Testing* 19, no. 4 (2019): 337–62, https://doi.org/10.1080/15305058.2018.1543309.

[29] Louis S Nadelson et al., "An Integrated Approach to Teacher Professional Development in STEM" 13, no. 2 (2012): 69–84.

[30] Silviana Nur Faizah et al., "Student Acceptance Study of PhET Simulation with an Expanded Technology Acceptance Model Approach," *Journal of Applied Engineering and Technological Science (JAETS)* 5, no. 1 (December 10, 2023): 279–90, https://doi.org/10.37385/jaets.v5i1.3041.

[31] Kholid, "Pentingnya Literasi Digital Bagi Guru Pada Lembaga Pendidikan Tingkat Dasar Dan Implikasinya Terhadap Penyelenggaraan Kegiatan Belajar Mengajar," *Jurnal Horizon Pendagogia* 1, no. 1 (2020): 22–27.

[32] Zulfitri Zulfitri, Mauloeddin Afna Fauzi, and Fakhrurrazi Fakhrurrazi, "The Nature of School Atmosphere Association to Improve the Students' Personalities in Madrasah Ibtidaiyah (MI) of Kota Langsa," *QALAMUNA: Jurnal Pendidikan, Sosial, Dan Agama* 14, no. 1 (2022): 89–112, https://doi.org/10.37680/qalamuna.v14i1.1228.

[33] "Theory, Literature Review, and Fun Learning Method Effectiveness in Teaching and Learning," *International Journal of Social Science and Education Research Studies* 03, no. 08 (2023): 1738–44, https://doi.org/10.55677/ijssers/v03i8y2023-30.

excellent results, so the model is feasible to use. Therefore, Akbar in SC et al's research[34] stated that the validation of learning devices is carried out by several experts related to the field in question providing assessments of learning tools through expert validation instruments to assess their suitability with theory and providing input for improvements to learning devices.

The results of expert validity for the lesson implementation plan (*Lesson Plan* LP) also received an excellent category. LP is validated to determine the correctness of the format and content of LP contained aspects of learning objectives, learning activities, time allocation, learning tools, and language. LP is categorized as feasible if it has fulfilled all aspects outlined in the validation sheet.[35]

Hence, the VFT-based learning model developed can be employed to determine the strengthening of students' digital literacy because the model is developed rationally in theory. There is relevance between the components of the learning material and the virtual field trip object, and it is developed based on a series of learning that coherently describes all activities outlined in the LP. It is in line with the research results that state virtual field trips aim to develop an internet-based visualized learning innovation to provide travel in real locations without leaving the classroom.[36]

The effectiveness of the virtual field trip-based learning model

The effectiveness of the virtual field trip-based learning model was determined by four indicators, namely the results of observations on strengthening digital literacy, learning outcomes, student activities in learning, and student responses to the application of the model. The effectiveness test results in small group trials, from the four indicators, have met the effectiveness criteria. Learning is effective if it achieves the desired goals regarding learning objectives and maximum student learning outcomes.[37]

These research results revealed that the average of each pose stage increased in each school in the first and second trials. The percent increase was obtained at 8%, 6.43%, and 5.83%. Virtual field trips that present contextual learning provide their interests to students, thus having a positive impact on learning outcomes. According to UNESCO, contextual-based learning models are a strategic choice for achieving educational goals, such as the learning process.[38] Hence, the VFT learning model has high support in achieving learning outcomes.

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[34] Denok Sunarsi et al., "The Effect of Competence, Work Discipline and Motivation of Employee Performance in the General Secretariat of the Ministry of Trade Jakarta," *Proceedings of the 1st International Conference on Economics Engineering and Social Science, InCEESS 2020, 17-18 July, Bekasi, Indonesia* (EAI, 2021), https://doi.org/10.4108/eai.17-7-2020.2303052.

[35] Fahmi Siti Fatimah et al., "Learning Fiqh Based on the TAPPS (Think Aloud Pair Problem Solving) Method in Improving Student Learning Outcomes," *At-Tadzkir: Islamic Education Journal* 2, no. 1 (January 21, 2023): 1–15, https://doi.org/10.59373/attadzkir.v2i1.13.

[36] Rina Oktaviana and Bambang Supriatno, "Penggunaan Metode Virtual Field Trip Berbantuan Augmented Reality" 3, no. 1 (2022): 9–18.

[37] Victor Chang, "Review and Discussion: E-Learning for Academia and Industry," *International Journal of Information Management* 36, no. 3 (2016): 476–85, https://doi.org/10.1016/j.ijinfomgt.2015.12.007.

[38] Jurnal Kependidikan et al., "Model Pembelajaran Kontekstual (Contextual Teaching Learning) Pada Pelajaran PAI Sebagai Salah Satu Inovasi Pengembangan Kurikulum Di Sekolah Romli Pendidikan Agama Islam

The effectiveness of the model for strengthening digital literacy in three madrasahs can be seen from the results of the first and second trials. On average, all three have increased. Based on the results of observations, the achievements of aspects were valuable with satisfactory results. In the first test, the average assessment of students' digital literacy compatibility level was at the Basic level. After the second test, there was a change in level to Medium. It is because students are starting to be interested and confident and have begun to get used to digital media. These findings implied that the application of VFT-based learning can provide links to digital literacy that may have existed before. Through interesting virtual media, students become enthusiastic about participating in learning. It aligns with research revealing that strengthening students who already have digital skills at the beginning can practice using more trained learning applications.[39]

The strengthening of digital literacy found in this study was caused by several factors in students, including a) feelings of attractiveness during learning, especially during virtual field trips; thus, students have their motivation to pay attention to learning material, b) feelings when answering questions such as telling their own experiences when knowing something, c) understanding of previous material that has been obtained from the teacher, and d) the age and characteristics of the student. While factors from outside the students include motivation from the teacher, the teacher's teaching ability, and the theme of the field trip visited virtually. It is in line with research that reveals that one of the main factors is influenced by the teacher's ability to implement the learning process.[40]

Another result of this research is that students actively follow learning steps corresponding to the model syntax. In addition, there was an increase in group discussion activities and student cooperation in operating laptop devices. Thus, the application of learning models can increase student activeness in learning while strengthening digital literacy. This result aligns with the research results that reveal elements of digital literacy in the form of active participation of individuals and students in learning activities that utilize the internet or digital media.[41]

The results of student activities in the VFT-based learning model obtained an average of 3.60 with an excellent category. It indicates that the learning goal is achieved, i.e., to make students active during learning; in line with the research results by Oktaviana & Supriatno,[42] that students are said to be active if the activity is above 50%. Moreover, the research results by Khotimah et al. convey that field trips can affect students' creative thinking and practice in tasks; thus, they are visible.[43]

(PAI), Pendidikan Jasmani Kesehatan Dan Rekreasi Materi Pembelajaran Yang Diberi" 08, no. 02 (2022), https://doi.org/10.32923/edugama.v8i2.2590.

[39] Yudi Herdiana, Yaya Suharya, and Novianti Indah Putri, "Pemanfaatan Teknologi Digital Di Masa Pandemi Covid-19," *Jurnal Teknologi Informasi Komunikasi (e-Journal)* 8, no. 2 (2021): 160–75.

[40] Elsa Susanti and Salmaini Safitri Syam, "Peran Guru Dalam Meningkatkan Kemampuan Literasi Matematika Siswa Indonesia," *Seminar Matematika Dan Pendidikan Matematika*, no. November 2017 (2017): 1–6.

[41] Setyaningsih et al., "Model Penguatan Literasi Digital Melalui Pemanfaatan E-Learning."

[42] Oktaviana and Supriatno, "Penggunaan Metode Virtual Field Trip Berbantuan Augmented Reality."

[43] Sita Husnul Khotimah et al., "Contribution of Virtual Field Trip and Spatial Intelligence toward the Improvement in Science Learning Achievement of Elementary School Student's," *AIP Conference Proceedings* 2320 (2021), https://doi.org/10.1063/5.0037619.

Effectiveness can also be seen in student responses to the application of the model. Student comments vary but generally provide constructive comments on the implementation of learning. Most students commented that the learning activities were attractive and not boring. Based on the description of student responses to VFT-based learning models, happy/ affirmative responses are obtained; thus, the model meets the effectiveness criteria according to student responses.[44]

The practicality of virtual field trip-based Learning Model

Practicality is the ease of using something; thus, its application is easy.[45] A similar matter was expressed by SC et al. that the model is practical if users do not face difficulties when presenting and using materials.[46] The field trip model met practical criteria based on the results known theoretically and empirically in this study. This is evidenced by the results of expert and practitioner assessments stating that learning models can be applied to strengthen students' digital literacy. In line with the research results, VFT provides practical classroom learning implications.[47] Meanwhile, empirically/tangibly, the trial results reveal that the model met practical criteria from the implementation indicators and teachers' ability to manage to learn.

CONCLUSION

The virtual field trip-based learning model meets the feasible criteria shown based on expert and practitioner assessments, with excellent criteria, so the learning model can be implemented in learning to strengthen the digital literacy of Madrasah Ibtidaiyah students. The virtual field trip-based learning model meets the Effective criteria shown by: 1) The results of observations of strengthening students' digital literacy with an average in the first and second tests experienced intensifying in excellent categories, and based on a summary of students' digital literacy competency levels, each Madrasah has strengthened from the basic level to the medium level. 2) The achievement of learning outcomes for Islamic religious materials from the three trial classes increased by more than 5%. 3) The average results of observing student activities in learning meet excellent criteria. 4) A positive response to the implementation of learning meets the "happy" or "agree" criteria.

Hence, the learning model can effectively strengthen the digital literacy of Madrasah Ibtidaiyah students. The virtual field trip-based learning model meets the practical criteria shown by the implementation of learning and the ability of teachers to manage to learn to get

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[44] Hanifa Ahsanu Amala, Amprasto Amprasto, and Rini Solihat, "Virtual Field Trip Dan Penggunaannya Sebagai Fasilitator Dalam Mengembangkan Keterampilan Komunikasi Abad Ke-21 Siswa," *Assimilation: Indonesian Journal of Biology Education* 2, no. 1 (2019): 29–34, https://doi.org/10.17509/aijbe.v2i1.16150.

[45] Deswita Maharani et al., "Pengembangan Perangkat Pembelajaran Dengan Metode Penemuan Terbimbing Pada Materi Dimensi Tiga Pada Sekolah Menengah Pertama," *Prisma* 11, no. 2 (2022): 436, https://doi.org/10.35194/jp.v11i2.2439.

[46] Pattimura SC, Maimunah Maimunah, and Nahor Murani Hutapea, "Pengembangan Perangkat Pembelajaran Matematika Menggunakan Pembelajaran Berbasis Masalah Untuk Memfasilitasi Pemahaman Matematis Peserta Didik," *Jurnal Cendekia : Jurnal Pendidikan Matematika* 4, no. 2 (2020): 800–812, https://doi.org/10.31004/cendekia.v4i2.286.

[47] Insook Han, "Immersive Virtual Field Trips in Education: A Mixed-Methods Study on Elementary Students' Presence and Perceived Learning," *British Journal of Educational Technology* 51, no. 2 (2020): 420–35, https://doi.org/10.1111/bjet.12842.

the excellent category so that the applicable learning model is employed as a reinforcement of digital literacy of Madrasah Ibtidaiyah students.

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