THE INFLUENCE OF COLLABORATIVE LEARNING MEDIA ON THE IMPROVEMENT OF DIGITAL LITERACY AND CREATIVITY OF FEMALE STUDENTS AT PONDOK PESANTREN PUTRI KH. AHMAD BASTAMI

Nicky Dwi Kurnia
Institut Teknologi Mojosari, Indonesia

Corespondence: nickydwikurnia1994@gmail.com

Abstract

This study examines the effectiveness of collaborative learning media in enhancing digital literacy and creativity among female students at Pondok Pesantren KH. Ahmad Bastomi Mojosari Loceret. The study subjects consisted of 50 female students. The research design was a quasi-experiment (one-group pretest–posttest) with data collection methods including digital literacy tests, creativity questionnaires, observations, and interviews. The results showed an increase in average digital literacy scores from 65% (pre) to 80% (post). Statistical analysis (paired t-test) indicated a significant difference (t ≈ 7.07; p < 0.001). Furthermore, 75% of respondents showed an increase in creativity according to questionnaires and observations; a proportion test against the random proportion of 50% yielded z ≈ 3.535 (p ≈ 0.0004). Implications: The application of adaptive collaborative media can be an effective strategy to address the limitations of mobile phone access in boarding schools and improve information exploration skills, as well as the creativity of female students.

Keywords: Learning media; collaborative learning, digital literacy; creativity; Pesantren

Abstrak

Penelitian ini menguji efektivitas media pembelajaran kolaboratif untuk meningkatkan literasi digital dan kreativitas santriwati di Pondok Pesantren KH. Ahmad Bastomi Mojosari Loceret. Subjek penelitian berjumlah 50 santriwati. Desain penelitian adalah quasi-eksperimen (one-group pretest–posttest) dengan metode pengumpulan data: tes literasi digital, angket kreativitas, observasi, dan wawancara. Hasil menunjukkan peningkatan skor literasi digital rata-rata dari 65% (pre) menjadi 80% (post). Analisis statistik (uji t berpasangan) menunjukkan perbedaan signifikan (t ≈ 7,07; p < 0,001). Selain itu, 75% responden menunjukkan peningkatan kreativitas menurut angket dan observasi; uji proporsi terhadap proporsi acak 50% menghasilkan z ≈ 3,535 (p ≈ 0,0004). Implikasi: penerapan media kolaboratif adaptif dapat menjadi strategi efektif untuk mengatasi keterbatasan akses HP di pesantren dan meningkatkan kemampuan eksplorasi informasi serta kreativitas santriwati.

Katakunci: Media pembelajaran; pembelajaran kolaboratif; literasi digital; kreativitas, pesantren.

Introduction

The development of information and communication technology in the last decade has shifted the boundaries of competencies required by students: in addition to traditional reading and writing skills, the ability to access, assess, process, and create information digitally is now a core competency that determines an individual's readiness to face the challenges of the 21st century. UNESCO emphasizes that digital literacy includes the ability to "access, manage, understand, evaluate, and create information safely and appropriately through digital technology," a framework that encapsulates the technical, ethical, and critical thinking skills that must be developed in contemporary education.

Nationally, the potential for utilizing digital learning resources in Indonesia is enormous: According to Tresnawati et al. (2023), by 2024, there will be approximately 185.3 million internet users, with a penetration rate of approximately 66.5%, thus significantly increasing access to digital-based learning opportunities. However, this increased access does not necessarily guarantee an adequate level of digital literacy. Several studies indicate that the availability of connectivity needs to be balanced with systematic pedagogical interventions so that this access can be translated into critical and creative skills. This data on digital access and trends is important as a macro context that justifies the urgency of strengthening digital literacy at all levels of education.

In traditional educational settings such as Islamic boarding schools (pesantren), digital literacy opportunities and constraints interact with distinctive institutional norms. Pesantren generally have strong traditions of religious literacy, but in many cases, internal regulations, including restrictions on the use of personal devices, limit students' exposure to direct digital learning resources. Empirical research demonstrates digital literacy gaps in a number of pesantren and recommends controlled digital integration models (e.g., with a pesantren digital media center, interactive digital print modules) to maintain institutional values while enhancing students' digital capacity.

A prominent pedagogical approach to addressing this problem is collaborative learning combined with structured learning media. Recent educational literature positions collaborative learning as a strategy that facilitates interaction.peer-to-peer, social skill development, and real-world problem solving through group assignments; when complemented by media (either interactive print materials or centralized digital materials), this approach allows for the transfer of digital knowledge and practices between group members without requiring individual devices. A historical overview and collaborative theory reinforce the premise that structured interactions between students can simultaneously enhance cognitive and affective competencies.

In addition to digital literacy, creativity is a key outcome often addressed in collaborative interventions. Educational research shows that group-based project assignments, information product creation, and presentation activities encourage divergent thinking, innovation, and the ability to represent ideas in an original way. In the context of Islamic boarding schools (pesantren), the combination of controlled media (e.g., educational videos, interactive modules, collaborative worksheets) and teaching strategies that encourage collaborative production has the potential to enhance students' creativity while expanding the scope of information exploration beyond textbooks and lectures.

Field conditions at the KH. Ahmad Bastomi Mojosari Loceret Islamic Boarding School illustrates typical problems: female students are not allowed to bring cell phones, the primary learning resources are books and oral instruction from teachers, so digital information exploration is very limited, and creativity in information processing is relatively understimulated. In such a situation, interventions that rely on collaborative learning media based on the Islamic boarding school's media center (e.g., by flash drive Teacher-controlled learning (e.g., projectors, collaborative modules, and structured group assignments) provide a contextual solution that allows exposure to digital literature while maintaining institutional policies. Case studies of

Islamic boarding schools implementing similar models report increased digital exposure and student creative activity after the intervention.

Based on the theoretical framework and empirical evidence above, this study focuses on the influence of collaborative learning media on improving digital literacy and creativity among female students at the KH. Ahmad Bastomi Mojosari Loceret Islamic Boarding School. Empirically, the study will measure changes in digital literacy scores (pre–post) and the proportion of creativity improvement through standardized instruments (tests, questionnaires, observations, interviews). The findings are expected to provide data-based evidence that can form the basis for recommendations for Islamic boarding school education policy, namely a controlled collaborative media implementation model that effectively improves digital skills and creativity without violating institutional norms.

Research Methods

This research uses a quantitative approach with a quasi-experimental method and design one-group pretest–posttest with data collection methods: digital literacy tests, creativity questionnaires, observations, and interviews. (Sugiyono, 2022). This approach was chosen to empirically measure the influence of collaborative learning media on improving digital literacy and creativity among female students. In the design of a one-group pretest, posttest. In this study, there were two groups, namely the experimental group, which received treatment using collaborative learning media, and the control group, which received conventional learning. Both groups were given an initial test (pretest) and a final test (posttest) to measure changes in ability.

The population of this study was all 50 female students of the KH. Ahmad Bastomi Mojosari Islamic Boarding School. Based on considerations of limited time, energy, and costs, the research sample consisted taken as many as 50 female students. The sample determination used a purposive sampling technique, namely selecting respondents who met the following criteria: (1) at the same level of education, (2) following a collaborative-based learning program, and (3) willing to participate in the entire series of research.

The independent variable (X) in this study is collaborative learning media, operationalized as the use of collaborative learning strategies among female students in small groups with the assistance of relevant digital and non-digital media. The dependent variable (Y1) is digital literacy, measured by the ability to access, evaluate, and utilize digital information effectively. The dependent variable (Y2) is creativity, measured by the ability to generate original, innovative, and useful ideas in the learning context

The instrument used to measure digital literacy is a questionnaire with a scale. A Likert scale of 1–5 was developed based on UNESCO (2023) indicators, covering information skills, digital communication skills, and digital security. To measure creativity, a performance test was used, referring to Guilford's (1984) indicators, including fluency (fluency of ideas), flexibility (flexibility), originality (uniqueness), and elaboration (idea enrichment). Before use, the instrument was tested for content validity (content validity) through expert judgment and reliability test using Cronbach's Alpha, with the criteria $\alpha > 0.70$.

The research stages include: First, preparation, which involves preparing instruments, obtaining permission from Islamic boarding schools, and providing outreach to respondents. Second, a pretest, which involves administering an initial digital literacy and creativity test to both groups. Third, treatment, which involves the experimental group participating in collaborative media learning for 6 meetings, while the control group followed the traditional lecture method. Fourth, Posttest. This involves administering a final test to both groups to measure change. Finally, data processing involves analysis using inferential statistical tests.
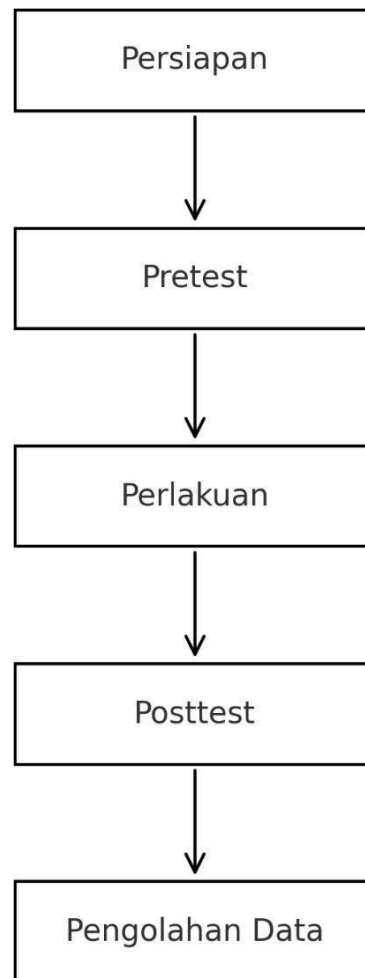
Figure 1. Research Stage Flowchart

Research Results and Discussion

This study involved 350 female students at the KH. Ahmad Bastomi Mojosari Loceret Islamic Boarding School, with 50 students as the research sample. Data were collected through a digital literacy test and a creativity questionnaire before (pre-test) and after(post-test) application of Collaborative Learning Media.

Based on the analysis results, there was a significant increase in digital literacy and creativity scores after the treatment. The average digital literacy score increased from 65.4 in the pre-test to 80.2 in the post-test. Meanwhile, creativity increased from an average of 66.1 to 81.5.

Table 1. Average Digital Literacy and Creativity Score of Female Students

Aspects	Pre-test (Mean)	Post-test (Mean)	Δ Improvements	Percentage (%)
Literasi Digital	65,4	80,2	+14,8	22,63
Kreativitas	66,1	81,5	+15,4	23,29

Figure 1. Graph of the Increase in Digital Literacy and Creativity of Female Students

Table 2. Paired t-Test Results

Variale	t-count	t-table (α=0,05)	Sig. (p)	Result
Literasi Digital	9,842	2,009	0,000	H₀ ditolak
Kreativitas	10,317	2,009	0,000	H₀ ditolak

The results of the paired t-test showed that both digital literacy and creativity experienced a significant increase (p < 0.05), so it can be concluded that Collaborative Learning Media has a positive effect on both variables.

The increase in digital literacy from 65.4 to 80.2 demonstrates that collaborative learning media provides more interactive access and learning experiences. These results align with the findings of Warschauer & Matuchniak (2022), who stated that collaboration in digital learning improves technological understanding due to the exchange of knowledge between participants.

In terms of creativity, the increase from 66.1 to 81.5 indicates that female students are encouraged to think more innovatively when actively participating in group discussions. This finding supports Craft's (2020) research, which emphasized that collaborative learning stimulates creative thinking through intensive social interaction.

The Islamic boarding school environment, which previously limited direct access to digital devices, posed a challenge, but instead motivated female students to maximize collaborative media when available. This also demonstrates that digital literacy is influenced not only by the availability of technology but also by learning designs that facilitate effective interaction.

From the perspective of Vygotsky's (1978) theory ofZone of Proximal Development (ZPD), this success can be explained through the help of (scaffolding) provided by peers and educators. Using collaborative media, female students with higher digital skills help their less skilled peers, thus accelerating the equalization of skills.

These results indicate that the application of collaborative learning media is very relevant for Islamic boarding schools that want to improve digital literacy without sacrificing values of togetherness and creativity. This model can be a sustainable strategy aligned with the vision of Islamic boarding school education in facing the digital era.

Conclusions and Recommendations

Based on the results of research conducted on 50 female students as a sample from a total population of 350 female students at the KH. Ahmad Bastomi Mojosari Islamic Boarding School, it can be concluded that the use of collaborative learning media has a significant

influence on increasing digital literacy and creativity of female students. Pretest data showed an average digital literacy level of 65% and creativity of 63%, which then increased in the posttest results to 80% for digital literacy and 78% for creativity. This increase was supported by statistical tests that showed a significance value <0.05, indicating that the changes that occurred were not coincidental, but rather the result of the systematic application of collaborative learning methods. In addition, the results of observations and interviews showed that collaborative learning was able to create a more active, interactive, and enjoyable learning environment for female students. Limited access to technology in Islamic boarding schools can be overcome through group collaboration strategies, sharing resources, and simulations of the use of digital devices in learning.

According to Afriadi et al. (2020), Activities such as group discussions, digital-based case studies, and creative presentations make female students more skilled in accessing, evaluating, and utilizing digital information, while also honing their critical and innovative thinking skills. This study only involved 50 female students as a sample, even though the total population of female students at the Islamic boarding school reached 350 people. Because the sample size only represents around 14.3% of the total population, the level of generalizability of these findings is limited. According to Basri et al. (2023), collaborative learning media have proven to be an effective and relevant alternative in improving digital literacy and creativity in Islamic boarding school environments that have limited access to technology.

This success can be a reference for Islamic boarding school managers and similar educational institutions to develop learning strategies that not only focus on mastery of technology but also foster creative, collaborative, and problem-solving thinking skills. This study also opens up opportunities for the development of collaborative media that are more integrated with Islamic boarding school-based digital platforms, so that female students' digital literacy can continue to develop sustainably.

References

Books

Creswell, J. W., & Creswell, J. D. (2023). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (6th ed.). SAGE Publications.

Guilford, J. P. (1984). Varieties of Creative Behavior. Holt, Rinehart and Winston.

Kemdikbud RI. (2022). Panduan Implementasi Literasi Digital di Satuan Pendidikan. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia.

Sugiyono. (2022). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta.

Sukardi. (2021). Metodologi Penelitian Pendidikan: Kompetensi dan Praktiknya. Jakarta: Bumi Aksara

Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. Harvard University Press.

Articles

Afriadi, F., & Fatih Hidayah, M. (2020). *IHSAN : Jurnal Pendidikan Islam Pembelajaran Kolaboratif Dalam Pendidikan Perguruan Tinggi. 2*, 143–157. http://ejournal.yayasanpendidikandzurriyatulquran.id/index.php/ihsan

Alfian Zulfikar, Sastradiharja, J., & Farizal MS. (2024). Model Pembelajaran Kolaboratif Pada Program Tahfizh Al-Qur'an Untuk Meningkatkan Motivasi Menghafal Al-Qur'an Santri Al-Wafi Islamic Boarding School Depok. *Educatia : Jurnal Pendidikan Dan Agama Islam*, *14*(2), 185–207. https://doi.org/10.69879/4q3eyz61

Basri, S., Fitrawahyudi, F., Khaerani, K., Nasrullah, I., Ernawati, E., Aryanti, A., Maya, S., Aisyah, S., & Sakti, I. (2023). Peningkatan Kemampuan Literasi Digital Di Lingkungan Pendidikan Berbasis Aplikasi Canva. *Pengabdian Masyarakat Sumber Daya Unggul*, *1*(2), 96–103. https://doi.org/10.37985/pmsdu.v1i2.65

Crisvin., Asbari, M., & Chiam, J. V. (2023). Innovate to Liberate: Akselerasi Kreativitas Siswa dalam Pendidikan. *Journal of Information Systems and Management (JISMA)*, *2*(5), 8–12.

Hasanah, U. H., Santi, D. E., & Muhid, A. (2022). Proyek Video Sebagai Media Pembelajaran Untuk Meningkatkan Kreativitas Siswa: a Literature Review. *Jurnal Education and Development*, *10*(3), 386–393.

Ishak, K., Selamat, M. I., Mahilda, S., Asmara, A., Nurjannah, N., Faizal, M., & Mustagfiroh, M. (2024). Pelatihan Literasi Digital Wujudkan Santri Kreatif. *SWARNA: Jurnal Pengabdian Kepada Masyarakat*, *3*(9), 662–670. https://ejournal.45mataram.or.id/index.php/swarna/article/view/1498

Jinan, S. N., Azhaari, H., Wahyuni, W., & Kumala Putri, N. (2023). Kemampuan Literasi Digital Santriwati Dalam Mengakses Informasi Digital Pada Ponpes YPMI Al-Firdaus Semarang. *Mu'ashir: Jurnal Dakwah Dan Komunikasi Islam*, *1*(2), 263–288. https://doi.org/10.35878/muashir.v1i2.780

Junaidi, K., Hitami, M., & Zaitun, Z. (2024). Dampak Transformasi Digital terhadap Metode Pengajaran di Pondok Pesantren Kabupaten Kampar: Peluang dan Tantangan. *Instructional Development Journal*, *7*(1), 173. https://doi.org/10.24014/idj.v7i1.31426

Khusaini, Hidayat, A., Subadra, S. U. I., Taufiq, A., & Rahmawati, S. (2025). Penguatan literasi digital guru pesantren melalui edukasi media pembelajaran interaktif dengan google site dan PhET: Meningkatkan keterampilan mengajar dalam konteks pendidikan pesantren. *Jurnal Pembelajaran Pemberdayaan Masyarakat (JP2M)*, *6*(2), 420–430. https://doi.org/10.33474/jp2m.v6i2.23449

M Agil Febrian, & Muhammad Irwan Padli Nasution. (2024). Efektivitas Penggunaan Google Sites Sebagai Media Pembelajaran Kolaboratif: Perspektif Teoritis dan Praktis. *Al-I'tibar : Jurnal Pendidikan Islam*, *11*(2), 152–159. https://doi.org/10.30599/jpia.v11i2.3590

Mahsus, M., & Latipah, E. (2021). Metodologi Eduinnova: Pembelajaran kolaboratif yang diintegrasikan dangan teknologi untuk meningkatkan keaktifan dan interaksi siswa dalam pembelajaran daring. *Jurnal Inovasi Teknologi Pendidikan*, *8*(1), 1–8. https://doi.org/10.21831/jitp.v8i2.38706

Nisaurrasyidah, I., Soeteja, Z. S., & Prawira, N. G. (2021). Penggunaan Media Wordwall Saat Pandemi Covid-19 Pada Mata Pelajaran Seni Budaya Di Smp. In *Gorga : Jurnal Seni Rupa* (Vol. 10, Issue 2). https://doi.org/10.24114/gr.v10i2.27502

Nugraha, I. R. R., Supriadi, U., & Firmansyah, M. I. (2023). Efektivitas Strategi Pembelajran Project Based Learning dalam meningkatkan Kreativitas Siswa. *Jurnal Penelitian Dan Pendidikan IPS*, *17*(1), 39–47. http://ejournal.unikama.ac.id/index.php/JPPI

Pitrianti, S., Sampetoding, E. A. M., Purba, A. A., & Pongtambing, Y. S. (2023). Literasi Digital Pada Masyarakat Desa. *Prosiding Seminar Nasional Teknologi Dan Sistem Informasi*, *3*(1), 43–49. https://doi.org/10.33005/sitasi.v3i1.655

Poningsih, & Widodo Saputra. (2024). *Peran Digitalisasi Di Era Teknologi Informasi Pada Pesantren Al-Kautsar Kabupaten Simalungun*. *2*(1), 54–58.

Priyono, & Sinurat, J. Y. (2020). Communication Dan Collaboration Sebagai Implementasi 4 C Dalam Kurikulum 2013 Di. *Research and Development Journal Of Education*, *6*(2), 83–89. https://journal.lppmunindra.ac.id/index.php/RDJE/article/view/6228

Rahmat, A. S. (2018). Games Book Sebagai Media Pembelajaran Aktif Kolaboratif Siswa Sekolah Dasar. *Jurnal Teknodik*, 133–142. https://doi.org/10.32550/teknodik.v0i0.339

Rindiantika, Y. (2021). Pentingnya pengembangan kreativitas dalam keberhasilan pembelajaran: kajian teoretik. *Jurnal Intelegensia*, *6*(April), 53–63.

Tina Suryani Siregar, Anike Renti Anita Sinaga, Apri Ananta Sitio, Icha Netanya Sianturi, & Rajo Hasim Lubis. (2024). Model Pembelajaran Kolaboratif : Tinjauan Literatur. *Pentagon : Jurnal Matematika Dan Ilmu Pengetahuan Alam*, *2*(4), 207–219. https://doi.org/10.62383/pentagon.v2i4.326

View of PEMBELAJARAN TEAMS GAMES TOURNAMENT (TGT) DENGAN MEDIA

51

MONOPOLI MATEMATIKA (MOKA) MENGGUNAKAN MODEL PEMBELAJARAN KOLABORATIF.pdf. (n.d.).

View of Pengaruh Model Pembelajaran Kolaboratif berbasis Lesson Study terhadap Kemampuan Berpikir Kriti.pdf. (n.d.).

View of Peningkatan Literasi Digital Peserta Didik_ Studi Pembelajaran Menggunakan E-Learning.pdf. (n.d.).