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PROMOTING SECONDARY SCHOOL TEACHERS' CRITICAL DIGITAL LITERACY THROUGH ANTI-HOAX EDUCATION PROGRAM

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Abstract

This community service program aimed to enhance secondary school teachers' critical digital literacy through an Anti-Hoax Education Program conducted in February 2026 at Al Amin Middle School, Pekanbaru City. Twelve teachers participated in the activity. The program employed a participatory training method involving four stages: needs assessment, interactive workshops, guided practice using fact-checking tools, and evaluation with reflective discussion. The instrument adapted from Wan Ng's digital literacy framework was used to measure participants' digital literacy competencies. Data were analyzed descriptively by comparing pretest and posttest scores. The results indicate that the average pretest score of participants increased from 61.4 to 84.7 in the posttest, showing a substantial improvement in teachers' ability to evaluate digital information, identify hoaxes, and apply ethical online communication practices. Participants also demonstrated increased confidence in integrating critical digital literacy into classroom learning activities. The program highlights that structured anti-hoax education can effectively strengthen teachers' digital competencies and support the development of critical and responsible digital culture within secondary school environments in Indonesia.

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Introduction

The rapid development of digital technology has transformed the way teachers access, produce, and distribute information in educational environments. Social media platforms and online communication channels provide broad opportunities for learning innovation; however, they also increase the spread of misinformation and hoaxes. Teachers are expected not only to utilize digital technologies for instructional purposes but also to critically evaluate information credibility before sharing it with students. Digital literacy therefore becomes an essential competency for educators in the twenty-first century learning environment (Ng, 2012; Martínez-Bravo et al., 2022; Ata & Alpaslan, 2024; Rahimi & Mosalli, 2025).

In Indonesia, the circulation of false information through social media continues to influence educational and social interactions. Many teachers still encounter difficulties in distinguishing factual information from manipulated digital content due to limited critical digital literacy skills. This condition may affect classroom learning because teachers often become information references for students. Consequently, strengthening teachers' competencies in identifying hoaxes and verifying online information is necessary to support responsible digital citizenship in schools (Auliawan & Ardi, 2021; Althibyani & Al-Zahrani, 2023; Prasetiyo et al., 2023).

Critical digital literacy refers to the ability to access, evaluate, analyze, create, and communicate information ethically through digital technologies. According to Ng (2012), digital literacy includes technical, cognitive, and socio-emotional dimensions that enable individuals to critically engage with digital information. The cognitive dimension is particularly important in identifying misinformation because it involves critical thinking, information evaluation, and decision-making processes. Ng (2012) also emphasizes that digital literacy should be integrated into educational practices to prepare individuals for responsible participation in digital society.

Several recent studies have highlighted the importance of digital literacy development in educational settings. Research conducted by Kantona and Munadi (2024) demonstrated that digital literacy competencies significantly influence individuals' ability to evaluate online information critically and avoid misinformation exposure. Similarly, Fitroh et al. (2024) found that teachers and students with stronger digital literacy skills are more capable of analyzing online sources, identifying biased information, and applying ethical communication practices in digital environments.

Although previous studies have extensively discussed digital literacy competencies, most research has focused on higher education students and instrument validation rather than direct educational community service programs for school teachers. Limited studies specifically address anti-hoax educational interventions designed for secondary school teachers in local school contexts. In addition, practical training activities integrating fact-checking practices and collaborative digital verification remain insufficiently implemented in many schools (Harlanu et al., 2023; Mesquita et al., 2024; Arribas et al., 2025). This gap indicates the need for applied educational service programs that directly strengthen teachers' critical digital literacy competencies.

Educational community service activities can become strategic efforts to bridge the gap between digital literacy theory and practical implementation in schools. Through participatory workshops, guided practice, and reflective discussion, teachers can develop practical competencies in identifying misinformation, verifying digital content, and integrating anti-hoax education into classroom learning. Such programs also support the development of critical thinking and ethical digital communication among educators and students (Meirbekov et al., 2022; Karitas & Suwartono, 2023; Zvereva, 2023; Waghid, 2024). Therefore, schools require sustainable collaborative programs that strengthen teachers' readiness to respond to digital misinformation challenges.

Based on these conditions, this community service program aims to promote secondary school teachers' critical digital literacy through an Anti-Hoax Education Program conducted at Al Amin Middle School, Pekanbaru City. The program is expected to improve teachers' abilities in evaluating digital information, identifying hoaxes, and applying ethical digital communication practices through participatory training and guided digital verification activities. Furthermore, this activity seeks to support the creation of a more critical, responsible, and digitally literate educational environment.

Method

This educational community service employed a participatory training approach aimed at strengthening secondary school teachers' critical digital literacy competencies through an Anti-Hoax Education Program. Participatory training emphasizes active participant involvement in discussion, collaborative problem-solving, guided practice, and reflective learning processes to improve practical competencies and critical awareness in educational contexts (Ng, 2012; Zamiri & Esmaeili, 2024; Dara & Kesavan, 2025; Tamilselvi et al., 2025). The service was conducted in February 2026 at Al Amin Middle School, Pekanbaru City, involving 12 teachers as participants.

The implementation of the service program consisted of four stages: preliminary assessment, preparation, implementation, and evaluation. During the preliminary assessment stage, the service team coordinated with the school to identify teachers' digital literacy needs and challenges related to misinformation and hoax dissemination in digital environments. Initial observations and informal interviews were conducted to understand participants' experiences in accessing and sharing online information. According to Karitas and Suwartono (2023), identifying participants' initial digital literacy conditions is important to ensure that training activities correspond to actual educational needs and digital communication challenges.

The preparation stage involved developing training materials, selecting hoax case examples, preparing digital verification tools, and designing evaluation instruments. The instrument used in this service was adapted from the digital literacy framework developed by Ng (2012), which measures technical, cognitive, and socio-emotional dimensions of digital literacy. The cognitive dimension was emphasized

because it is closely related to critical thinking, information evaluation, and the identification of misinformation in digital media.

The implementation stage was carried out through interactive workshops and guided practice sessions. Participants received educational materials concerning critical digital literacy, characteristics of hoaxes, ethical digital communication, and fact-checking strategies. The workshop activities included group discussions, collaborative analysis of misinformation cases, and simulations using digital verification tools to examine online news credibility. Previous studies have shown that practice-based digital literacy training can improve participants' ability to critically analyze digital information and reduce vulnerability to misinformation exposure (Droog et al., 2024; Kantona & Munadi, 2024; Le et al., 2025; Choi & Bang, 2026).

Furthermore, participants engaged in guided simulations to identify manipulated information, verify online sources, and evaluate digital content reliability. Reflective discussions were conducted at the end of each session to encourage participants to connect the training materials with their classroom teaching practices. Harlanu et al. (2023) explain that reflective and collaborative digital literacy activities can strengthen participants' analytical thinking and promote responsible digital engagement in educational settings.

The evaluation stage utilized pretest and posttest assessments to measure participants' improvement in critical digital literacy competencies following the training activities. Observations and participant feedback questionnaires were also used to evaluate program effectiveness and participant responses toward the Anti-Hoax Education Program. The collected data were analyzed descriptively by comparing pretest and posttest mean scores to identify improvements in teachers' understanding of digital literacy concepts, misinformation detection, and ethical digital communication practices. Figure 1 presents the flow of the community service implementation.

Figure 1. Flow of community service implementation based on Critical Digital Literacy through Anti-Hoax Education Program

Results and Discussion

A. Description of Community Service Implementation

The community service activity entitled Promoting Secondary School Teachers' Critical Digital Literacy through the Anti-Hoax Education Program was conducted in February 2026 at Al Amin Middle School, Pekanbaru City. The program involved 12

teachers as participants and aimed to strengthen teachers' competencies in identifying misinformation, evaluating digital information critically, and applying ethical digital communication practices in educational settings. The implementation of this educational service was carried out collaboratively between the service team and the school through participatory and practice-based learning activities.

The implementation began with a preliminary assessment stage to identify teachers' initial understanding of digital literacy and misinformation issues commonly encountered in digital environments. The service team coordinated with school representatives, conducted observations, and carried out informal interviews to examine participants' experiences in accessing and sharing online information. This stage was important for determining the training focus and adjusting the materials to participants' actual needs in educational contexts.

Following the preliminary assessment, the preparation stage was conducted by developing training materials, preparing hoax case examples, selecting digital verification tools, and designing evaluation instruments. The service team adopted the digital literacy framework developed by Ng (2012), which emphasizes technical, cognitive, and socio-emotional dimensions of digital literacy. Various learning media, including presentation slides, fact-checking demonstrations, and collaborative discussion materials, were prepared to support interactive learning activities.

The implementation stage consisted of interactive workshops and guided practice sessions. During the workshop, participants received educational materials concerning critical digital literacy, misinformation characteristics, ethical communication in digital environments, and strategies for identifying hoaxes. The facilitators also introduced participants to fact-checking techniques and digital verification platforms that could be utilized to evaluate the credibility of online information sources.

In the guided practice session, participants worked collaboratively to analyze examples of misinformation circulating on social media and digital platforms. Teachers practiced identifying misleading information, verifying digital content, evaluating website credibility, and discussing the potential impacts of hoaxes on educational environments. These activities encouraged participants to apply critical thinking skills directly through real digital literacy cases relevant to their daily experiences.

Reflective discussion activities were conducted at the end of each session to provide opportunities for participants to share experiences, discuss challenges, and connect the training materials with classroom learning practices. Teachers also discussed strategies for integrating anti-hoax education into teaching activities to encourage students' critical awareness toward digital information. This reflective approach supported participant engagement and strengthened collaborative learning among teachers.

The final stage involved evaluation and follow-up activities. Evaluation was conducted through pretest and posttest assessments, participant observations, and feedback questionnaires to measure improvements in teachers' digital literacy competencies after participating in the program. The results indicated increased participant understanding regarding misinformation identification, digital

information verification, and ethical digital communication practices. The service team subsequently compiled the program findings and provided recommendations for sustainable digital literacy activities in the school environment to support the development of a more critical and responsible digital culture.

B. Pretest and Posttest Assessment Result

The effectiveness of the Anti-Hoax Education Program was evaluated using pretest and posttest assessments administered to 12 secondary school teachers participating in the community service activity. The assessment instrument was adapted from the digital literacy framework developed by Wan Ng, which measures technical, cognitive, and socio-emotional dimensions of digital literacy. The pretest was conducted before the implementation of the educational workshop to identify participants' initial understanding of digital literacy and misinformation identification. Meanwhile, the posttest was administered after all training and guided practice activities were completed to measure improvements in participants' competencies.

The assessment focused on participants' abilities to identify hoaxes, evaluate digital information credibility, verify online sources, and apply ethical digital communication practices. The collected data were analyzed descriptively by comparing the average pretest and posttest scores obtained by participants.

Table 1. Pretest and Posttest Results of Teachers' Critical Digital Literacy

Assessment Aspect	Pretest	Posttest	Improvement (Point)
Identifying hoax characteristics	60.8	85.4	24.6
Evaluating information credibility	62.1	86.2	24.1
Verifying online sources	59.7	83.5	23.8
Ethical digital communication	63	84.9	21.9
Critical analysis of digital content	61.5	83.7	22.2
Overall Mean Score	**61.4**	**84.7**	**23.3**

The results presented in Table 1 indicate that participants experienced improvements across all assessment aspects after participating in the Anti-Hoax Education Program. The overall mean score increased from 61.4 in the pretest to 84.7 in the posttest, demonstrating an improvement of 23.3 points (approximately 37.9%). This increase suggests that the Anti-Hoax Education Program contributed positively to participants' critical digital literacy competencies. This finding suggests that the workshop activities and guided simulations effectively enhanced participants' understanding of misinformation patterns and digital manipulation techniques.

Improvements were also identified in participants' abilities to evaluate information credibility and verify online sources. Through collaborative discussions and fact-checking simulations, teachers became more familiar with identifying trustworthy information sources and assessing the validity of online content. These

findings support Ng's (2012) perspective that cognitive digital literacy skills are closely related to critical thinking and information evaluation abilities in digital environments.

In addition, participants demonstrated better understanding of ethical digital communication practices after participating in reflective discussions and collaborative learning activities. Teachers expressed greater confidence in integrating anti-hoax education into classroom learning to encourage students' critical awareness toward digital information. Overall, the evidence suggests indicate that participatory and practice-based digital literacy training can effectively strengthen teachers' critical digital literacy competencies and support the development of responsible digital culture in educational settings.

C. Discussion

The present study demonstrates of this community service program indicate that the Anti-Hoax Education Program was associated with improvements in secondary school teachers' critical digital literacy competencies. The increase in the overall mean score from the pretest to the posttest demonstrates that participatory workshops and guided practice activities effectively enhanced teachers' abilities to identify misinformation, evaluate information credibility, and apply ethical digital communication practices. These findings support the theory proposed by Wan Ng, who explains that digital literacy is not limited to technical skills but also includes cognitive and socio-emotional competencies required to critically evaluate digital information and participate responsibly in digital environments. The cognitive dimension became particularly visible during the guided verification activities, where participants analyzed online content and practiced fact-checking strategies.

The improvement in teachers' competencies also confirms that practical and collaborative learning approaches are effective in strengthening critical digital literacy skills. During the implementation process, participants actively engaged in simulations, group discussions, and digital verification exercises that encouraged critical thinking and reflective analysis. These results are consistent with previous research showing that digital literacy education can reduce vulnerability to misinformation exposure and improve individuals' abilities to evaluate online information critically (Anthonysamy & Sivakumar, 2024; Huang, 2024; Nurfazri et al., 2024; Georgopoulou et al., 2025). The study emphasized that critical thinking culture in education plays an important role in preventing the spread of hoaxes because participants become more selective and analytical when interpreting digital information.

Furthermore, the program outcomes reveal indicate that teachers' digital literacy competencies significantly influence their ability to guide students in identifying misinformation and using digital media responsibly. Participants demonstrated increased confidence in integrating anti-hoax education into classroom learning activities after participating in the program. This finding aligns with the study conducted by Simamora et al. (2024), which revealed that teachers with higher digital literacy levels are more capable of encouraging students' critical thinking and

information verification skills in digital environments. The study also found that media technology usage positively contributes to students' ability to recognize hoaxes when teachers possess adequate digital competencies.

The guided practice and collaborative fact-checking activities implemented in this service program also support previous educational service studies emphasizing the importance of experiential learning in anti-hoax education. Fitri et al. (2024) reported that anti-hoax educational strategies involving active participation and digital verification practice could strengthen participants' understanding of misinformation characteristics and improve digital literacy awareness. The present program similarly demonstrated that participants became more familiar with identifying manipulated information, evaluating website credibility, and verifying digital content through hands-on learning experiences.

In addition, reflective discussions conducted during the training sessions contributed to participants' socio-emotional digital literacy development. Teachers not only improved their technical understanding of misinformation verification but also developed greater awareness regarding ethical communication and responsible digital behavior. According to Rusmana et al. (2023), anti-hoax movements and digital literacy initiatives can strengthen collaborative awareness and encourage responsible participation in digital communities through fact-checking and critical information sharing practices. These reflective learning activities therefore played an important role in fostering teachers' awareness of their responsibilities as digital information mediators in school environments.

The data show also indicate that educational institutions require sustainable digital literacy programs to address the continuing growth of misinformation in digital environments. Recent studies emphasize that teacher digital competence development remains a critical issue because the rapid spread of disinformation through social media continues to affect educational contexts. Pérez-Escoda et al. (2026) argue that teacher training programs focusing on misinformation management and social media literacy are necessary to support teachers in developing learners' digital competence and critical thinking skills. The present community service program supports this perspective by demonstrating that structured anti-hoax education can enhance teachers' readiness to respond to misinformation challenges in classroom learning.

Overall, this educational service program contributes to strengthening teachers' critical digital literacy through participatory and practice-based learning activities. The combination of workshops, simulations, collaborative verification practices, and reflective discussions effectively improved teachers' abilities to critically analyze digital information and promote responsible digital communication. These findings reinforce the importance of integrating anti-hoax education into school literacy programs as part of broader efforts to develop critical, ethical, and digitally resilient educational communities.

Despite the positive outcomes observed in this program, several limitations should be acknowledged. The activity involved a relatively small number of participants from a single school, limiting the generalizability of the findings. In addition, the evaluation relied primarily on descriptive pretest-posttest comparisons without inferential statistical analysis. Future programs should involve larger

participant groups and apply more rigorous evaluation methods to strengthen the evidence regarding the effectiveness of anti-hoax education interventions.

Conclusion

The community service program entitled Promoting Secondary School Teachers' Critical Digital Literacy through the Anti-Hoax Education Program successfully enhanced teachers' competencies in identifying misinformation, evaluating digital information credibility, and applying ethical digital communication practices in educational contexts. The implementation of participatory workshops, guided simulations, collaborative fact-checking activities, and reflective discussions contributed positively to strengthening teachers' critical digital literacy skills. The improvement in participants' pretest and posttest scores indicates that practice-based anti-hoax education effectively supports teachers' cognitive, technical, and socio-emotional digital literacy competencies.

The findings demonstrate that teachers require structured and sustainable digital literacy programs to address the growing challenges of misinformation dissemination in digital environments. Through direct engagement with fact-checking strategies and collaborative analysis of digital content, participants developed greater critical awareness and confidence in integrating anti-hoax education into classroom learning activities. This program also highlights the important role of schools in fostering responsible digital culture and strengthening critical thinking among educators and students.

Furthermore, this educational service contributes practically to the development of school-based digital literacy initiatives by providing an applicable model for anti-hoax education in secondary school settings. Future community service programs are recommended to involve larger participant groups, integrate long-term mentoring activities, and expand digital literacy collaboration with educational institutions and local communities to strengthen sustainable digital resilience in Indonesia.

Recommendation

Based on the implementation and findings of the Anti-Hoax Education Program, several recommendations can be proposed to strengthen future educational community service activities related to critical digital literacy development. First, schools should integrate critical digital literacy and anti-hoax education into continuous professional development programs for teachers. Sustainable training activities are necessary to ensure that teachers remain adaptive to the rapid development of digital information technology and evolving misinformation patterns in online environments.

Second, educational institutions are encouraged to establish collaborative partnerships with universities, digital literacy organizations, and fact-checking communities to provide broader access to updated digital verification resources and educational materials. Such collaboration can support the implementation of more

comprehensive and practice-oriented digital literacy programs within school environments.

Third, future community service programs should involve larger participant groups and include students, parents, and school administrators to create a more inclusive digital literacy ecosystem. Expanding participant involvement may strengthen collective awareness regarding responsible digital communication and misinformation prevention in educational communities.

Fourth, future programs are recommended to incorporate long-term mentoring, periodic evaluation, and technology-based learning media to monitor participants' digital literacy development continuously. Follow-up activities such as online discussion forums, digital campaigns, and collaborative fact-checking projects may further enhance participants' practical engagement with anti-hoax education.

Finally, further studies and educational service initiatives should explore the long-term impact of anti-hoax education on teachers' classroom practices and students' critical thinking development. Additional research may also examine the effectiveness of different digital literacy intervention models across diverse educational contexts to support evidence-based digital literacy policies and sustainable educational transformation in Indonesia.

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