



The Effectiveness of QR Fact Learning Based Posters in Journalism Learning to Improve Fact Verification Skills in the Post Truth Era

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Abstract

The advancement of digital technology and the widespread use of social media in the post-truth era have blurred the boundaries between fact and opinion, increasing the spread of hoaxes, misinformation, and disinformation. This situation requires journalism students to have critical thinking skills and fact-verification skills. However, learning in higher education is still limited in providing applicable and integrated learning experiences. This study aims to measure the effectiveness of QR-Fact Learning media in improving the fact-verification skills and understanding of students in the Islamic Communication and Broadcasting Study Program (KPI). The study used the Research and Development (R&D) method with the ADDIE model. Participants consisted of 60 KPI students of UIN North Sumatra who were selected through a purposive sampling technique. The research instrument was a questionnaire whose validity and reliability had been tested, as well as pre-test and post-test. The results of the validity test showed that all instrument items were valid (r count > 0.254), while the reliability test obtained a Cronbach's Alpha value of 0.81, which is categorized as reliable. Effectiveness analysis using the N-Gain test resulted in a score of 78%, categorized as effective. The findings indicate that QR-Fact Learning media is able to improve fact-verification skills. This media is worthy of being an innovative learning alternative to strengthen information literacy and face information challenges in the digital era.

INTRODUCTION

The development of digital technology and social media has brought about significant changes in the patterns of information production, distribution, and consumption in contemporary society. On the one hand, technological advances have made it easier for people to access and disseminate information quickly.

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On the other hand, the openness of the digital realm also presents challenges, particularly regarding the increasing and difficult-to-control spread of hoaxes, misinformation, and disinformation. Social media has become a primary platform for sharing news, opinions, and various other types of information. However, the ease of access and speed of dissemination characteristic of social media also make it vulnerable to the spread of inaccurate information, including hoaxes (fake news). Indeed, this easy access to information presents serious challenges, particularly regarding the widespread spread of hoaxes (Castells, 2023)

Social media, as an open space for public interaction, has become fertile ground for the emergence of unverified information, which can trigger misunderstandings, social unrest, and even real conflict in society. Hoaxes can emerge in various contexts, such as politics, health, social issues, and even personal life. This phenomenon demands students' ability to discern and verify information wisely (Sinaga & Azhar, 2025).

From an Islamic perspective, a critical attitude towards information has long been taught through the concept of *tabayun*, the process of researching, checking, and confirming the truth of information before believing or spreading it. This principle is enshrined in the Koran, Surah Al-Hujurat, verse 6:

يَا أَيُّهَا الَّذِينَ آمَنُوا إِن جَاءَكُمْ فَاسِقٌ بِنَبَأٍ فَتَبَيَّنُوا أَن تُصِيبُوا قَوْمًا بِجَهْلَةٍ فَتُصِبْحُوا عَلَىٰ مَا فَعَلْتُمْ
نَادِمِينَ

"O you who believe, if a wicked person comes to you with news, verify its truth, lest you harm a people out of ignorance (carelessness), which would ultimately make you regret what you did." (RI, 2019)

This verse demonstrates that Islam places information verification as part of a Muslim's moral responsibility. The value of *tabayyun* (verification) becomes particularly relevant in addressing the Post-Truth phenomenon, a condition in which objective facts are replaced by opinions, emotions, and personal beliefs in shaping public perception. Therefore, the ability to verify facts is not only a necessity in the context of digital literacy but also an implementation of Islamic communication ethics (Hamad, 2022)

The Post-Truth phenomenon is characterized by the increasing spread of hoaxes, misinformation, and disinformation through open and participatory digital platforms. Social media allows every individual to act as a producer of information, but this is not always accompanied by adequate digital literacy skills and journalistic ethics. As a result, the lines between fact, opinion, and information manipulation are increasingly blurred, making it difficult for the public to distinguish between valid information and misleading information (Mahyuddin et al., 2022).

This situation poses a serious challenge for education, particularly in journalism, which has a moral and academic responsibility to maintain the accuracy of information. Journalism education no longer focuses solely on technical skills such as news writing; it must also systematically develop critical thinking skills, digital literacy, and fact-checking skills. Digital literacy, in this case, is a crucial 21st-century competency that determines the quality of individual participation in the digital public sphere (O.E.C.D., 2024).

Students of Islamic Communication and Broadcasting (KPI), particularly those taking journalism courses, hold a strategic position as future public communicators who will play a role in shaping public opinion and awareness. Therefore, mastering fact-checking skills is a crucial part of their learning process. The selection of KPI students as research subjects was based on initial observations indicating that KPI students at UIN North Sumatra have not utilized poster-based

learning media with the QR-Fact Learning approach in the fact-verification process. This observation also indicates that the journalism learning process is still dominated by theoretical approaches, class discussions, and the use of conventional media such as PowerPoint (PPT) and group presentations. The practice of fact-verification has not yet become a directly integrated learning experience. As a result, students tend to judge the veracity of information based on intuition or personal opinion, rather than through systematic and structured journalistic verification procedures.

This research is a continuation of previous research that focused on measuring student perceptions of journalism learning media. Unlike previous research, this study aims to measure the effectiveness of the developed learning media product, thereby making a more applicable contribution to improving the quality of journalism learning (Amazeen, 2020).

The product developed in this research is a poster-based learning media using the QR-Fact Learning approach. This media is designed not only as an informative and engaging visual aid but also as a gateway to various integrated digital learning resources. By scanning a QR code, students can access various learning features, such as interactive learning videos, websites for verifying fake news, learning materials in PowerPoint (PPT) format, and other supporting content relevant to journalistic practice, particularly the fact-verification process (Arikunto, 2010).

By integrating visual media and digital technology, this learning tool is expected to bridge the gap between the demands of journalistic competency in the post-truth era and the realities of learning in higher education. Furthermore, the use of QR-Fact Learning is expected to increase student engagement in the learning process and strengthen their ability to verify facts critically, systematically, and based on credible sources (Walter et al., 2020).

Although the demands of journalistic competency in today's era are increasingly complex, the reality of learning in higher education shows a significant gap. On the one hand, students are required to have the ability to verify facts quickly, accurately, and based on data (Resti & Dwi, 2026). However, on the other hand, the ongoing learning process still does not fully accommodate these needs in a practical and contextual manner. Journalism learning still tends to be oriented towards knowledge transfer, rather than developing fact-verification skills as a core practice.

This gap becomes even more crucial when combined with the characteristics of the current generation of students, who are highly connected to digital technology but do not necessarily possess adequate digital literacy skills. (Karim, 2024) This situation has the potential to create a paradox: students actively access and disseminate information, yet lack the competency to validate its accuracy. If this situation persists, journalism graduates risk being unprepared to face the challenges of a communications world rife with disinformation.

Furthermore, initial observations of KPI students at UIN North Sumatra indicate a lack of integration between visual learning media and interactive digital technologies specifically designed to train fact-checking skills. The learning media used are still one-way and lack practical learning experiences. In the context of modern learning, learning effectiveness is largely determined by the media's ability to provide interactive, contextual, and practice-based learning experiences.

The Post-Truth Era and Its Challenges for Journalism

The post-truth era describes a social condition in which objective facts are no longer the dominant factor in shaping public opinion, but are instead replaced by emotions, personal beliefs, and ideological affiliations (McIntyre, 2023). This phenomenon is further amplified by the algorithmic and participatory nature of social media, allowing information, including hoaxes and disinformation, to spread rapidly, widely, and with difficulty being controlled (Vosoughi et al., 2018). In this

context, low levels of public media literacy contribute to the inability to distinguish between fact, opinion, and propaganda (Flew, 2024).

The implications of the post-truth era for journalistic practice are significant. One is the decline in public trust in the media and increased pressure on journalists to produce news quickly without thorough verification. This condition not only impacts the quality of the information circulated but also threatens the integrity of the journalistic profession itself. Therefore, strengthening fact-checking competencies is an urgent need, particularly in the context of journalism education, which fosters the development of professional and ethical journalists.

Digital Literacy and Fact-Checking Skills

Digital literacy is defined as a set of skills encompassing the activities of accessing, analyzing, evaluating, and producing information critically, reflectively, and ethically in the digital space (U.N.E.S.C.O., 2023). Digital literacy can also refer to a deep understanding of literacy in a knowledge society, with its implications for competence, empowerment, and critical reflection. Literacy is supported by critical thinking and the ability to challenge dominant ideologies (Karim, 2024). In this context, previous research has found that an individual's ability to verify facts is positively correlated with digital literacy levels and plays a crucial role in increasing resilience to exposure to hoaxes (Pennycook & Rand, 2023).

However, various studies indicate that students, including journalism students, still face barriers in optimally applying fact-checking skills (Humprecht et al., 2020). This is due to the limited availability of learning media that can provide real-world context and application. This finding is supported by Haliq, who stated that students experience difficulty assessing the credibility of sources and distinguishing between fact, opinion, and disinformation due to a lack of real-world case-based training relevant to today's digital information dynamics (Haliq et al., 2024).

Journalism Learning and Learning Media Innovation

In practice, journalism learning in higher education still tends to be oriented toward theoretical approaches and has not been fully integrated with digital-based information verification practices (Zulmawati, 2025). The learning media used are also often not contextualized with the realities of social media that students encounter in their daily lives. This situation highlights the need for innovative learning media that can bridge theoretical aspects with real-world practice (Putri & Ardoni, 2025).

Several studies in media education have shown that the use of technology-based learning media has significant potential to increase student learning engagement, conceptual understanding, and critical thinking skills (Mayer, 2023). Furthermore, other research confirms that visual media combined with interactive digital access has proven more effective in improving information literacy than conventional learning methods (Hobbs, 2024).

One technological innovation considered relevant and adaptive is the use of QR codes as a link between print media and digital learning resources. QR codes enable more flexible and interactive learning integration, thereby enriching students' learning experiences (Rahayu et al., 2024). Meanwhile, the integration of interactive digital media in journalism learning is crucial for improving fact-checking competencies (Panuayan & Baguio, 2025). However, this research focused on measuring student abilities and did not specifically develop learning media designed for this purpose.

In journalism studies, verification is a fundamental principle that distinguishes professional journalism from other forms of communication. Kovach and Rosenstiel

explain that the essence of journalism lies in the discipline of verification, namely A systematic process for ensuring the accuracy of information through fact-checking, confirmation with multiple sources, the use of reliable evidence, and transparency in the reporting process (Kovach & Rosenstiel, 2021). This principle is increasingly important in the digital age, when information flows rapidly and every individual can act as an information producer.

Furthermore, Gatekeeping theory, developed by White and further developed by Shoemaker and Vos, explains that journalists serve as gatekeepers of information before it is released to the public. However, in the era of social media, the gatekeeping function has shifted, as the public can disseminate information directly without editorial processing.

This situation means that fact-checking skills are no longer just a competency for professional journalists but are also essential for journalism students as aspiring public communicators (Sameto et al., 2025). It can be concluded that most studies still position students as objects of digital literacy measurement and fact-checking, without providing interventions in the form of integrated learning experiences through innovative learning media. Furthermore, there is limited research specifically developing and testing the effectiveness of poster-based journalism learning media using the QR-Fact Learning approach as a learning tool in addressing the challenges of the post-truth era.

Various previous studies have shown that students' digital literacy and fact-checking skills remain suboptimal. Previous research found that students possess a basic understanding of digital literacy but still struggle to independently verify information (Yuliani, 2024). Similar findings have been demonstrated in other studies, where students still struggle to distinguish between fact, opinion, and misinformation due to a lack of real-life case-based learning experiences (Haliq et al., 2024).

Although various studies have examined students' digital literacy and fact-checking skills, most have focused on measuring students' abilities or perceptions regarding the use of learning media. Previous research has not developed or tested the effectiveness of learning media that can provide hands-on learning experiences in fact-checking practices. This situation indicates a research gap regarding the need for learning media that are not only visually appealing but also interactive and capable of significantly improving students' fact-checking skills.

This issue is increasingly important for students in the Islamic Communication and Broadcasting (KPI) Study Program, as prospective public communicators who are required not only to possess journalistic competence but also to uphold Islamic communication values such as honesty, trustworthiness, and *tabayun* (reliability) in conveying information. If fact-checking skills are not developed during the learning process, students are at risk of spreading unverified information in the digital space. As a solution to this problem, this research developed a poster-based learning medium called QR-Fact Learning, which integrates visual media with QR Code technology. Through this medium, students can access various digital learning resources, such as interactive materials, educational videos, and fact-checking websites, which can train information verification skills in a more contextual and applicable manner.

The development of QR-Fact Learning media has important implications for Islamic journalism and communication education, as it not only improves students' digital literacy and critical thinking skills but also instills the value of *tabayun* (reconciliation) as a communication ethic in dealing with the rapid flow of information in the post-truth era. Therefore, this learning medium is expected to be an innovation capable of producing future communicators who are critical, responsible, and possess integrity in disseminating information.

METHODS

This study used the R&D (Research and Development) method to determine the feasibility, effectiveness, and efficiency of the developed learning media. The research design employed the ADDIE model, which consists of five systematic stages: (1) Analysis (needs and problem analysis), (2) Design (product design), (3) Development (product development), (4) Implementation (product application in learning), and (5) Evaluation (evaluation of product quality and effectiveness). This model was chosen because it provides a structured and flexible framework for developing and evaluating technology-based learning media.

This research was conducted at UIN North Sumatra, with a population of 450 KPI students taking journalism courses. The sample size was determined at 60 respondents using a purposive sampling technique. The minimum sample size is five times the number of instrument items according to Hair et al. (2019). A 12-item questionnaire resulted in a minimum of 60 respondents. Furthermore, this number aligns with the characteristics of development research, which, according to Borg and Gall, as well as Sugiyono, can use 30-100 respondents for a limited field trial.

The instrument validity test was conducted using the Pearson Product Moment correlation technique. With 60 respondents at a significance level of 0.05, the r table was obtained at 0.254, so the instrument item was declared valid if the calculated r was greater than 0.254. Furthermore, the reliability test was conducted using the Cronbach's Alpha method to determine the level of instrument consistency. The effectiveness of the learning media was measured by comparing students' pre-test and post-test scores, which were then analyzed using the N-Gain test.

The N-Gain scores obtained were interpreted into three categories, namely high ($g \geq 0.7$), moderate ($0.3 \leq g < 0.7$), and low ($g < 0.3$), referring to the Hake criteria (in Yohanis, Triwiyono, & Modouw, 2013). In addition, the average standard gain value was converted into a percentage and interpreted based on the effectiveness category, namely ineffective ($< 40\%$), less effective ($40-55\%$), quite effective ($56-75\%$), and effective ($> 76\%$). The analysis of the effectiveness of QR-Fact based learning media is based on student responses with calculations using 4 scores, namely the criteria strongly agree (SS) with a score of 4, agree (S) with a score of 3, disagree (TS) with a score of 2, and strongly disagree (STS) with a score of 1.

RESULT AND DISCUSSION

In the research findings phase, the researchers presented a visualization of the learning media used as the primary instrument in testing the effectiveness of QR-Fact Learning in improving fact-verification skills. The media used was a QR-Fact Learning-based poster that had undergone a refinement process and was deemed suitable for use in the research process. Therefore, the discussion no longer focused on the development process but rather on how the media functioned as an educational tool to support student understanding.

This media was designed by integrating the poster's visual elements and digitally accessible QR Code technology. By scanning the QR Code, users can obtain additional factual and verified information, which is expected to help them identify and understand information more critically in the post-truth era.

This media visualization aims to provide an overview of the form and characteristics of the product used in the test, thus facilitating the understanding of the effectiveness analysis results, which will be discussed in the next section. The visualization of the learning media used in this study is presented in the following image:



Figure 1-4: QR-Fact Learning product display

At this stage, the researchers presented the results of testing the research instrument used to measure the effectiveness of the QR-Fact learning media. Based on the validity test, all statement items had calculated r values greater than the table r value of 0.254. This indicates that all items in the research instrument are valid and able to accurately measure the effectiveness of the QR-Fact media. Next, to determine the level of instrument consistency, a reliability test was conducted using the Cronbach's Alpha method.

A Cronbach's Alpha value of 0.81 was obtained. This value indicates that the research instrument is reliable and can be used as a data collection tool to measure the effectiveness of the QR-Fact media. Therefore, based on the results of the validity and reliability tests, all items in the research instrument were deemed appropriate and could be used in the next data collection stage.

After the research instrument was declared valid and reliable, the next step was to test the effectiveness of using QR-Fact-based learning media in improving students' critical thinking and fact-verification skills. The effectiveness test in this study was conducted using N-Gain analysis, which aims to determine the level of improvement in learning outcomes before and after the use of the learning media. This analysis was used to measure the extent to which QR-Fact media impacted

students' conceptual understanding and critical thinking skills in handling information in the post-truth era.

Before the learning process, students were given a pretest to assess their initial abilities related to the material on combating hoaxes and how to verify facts. The learning process then used QR-Fact-based learning media as the primary means of delivering the material. After all the material was presented, students were given a posttest to determine improvements in understanding and critical thinking skills after using the media. The comparison between the pretest and posttest results was then analyzed using the N-Gain test to determine the effectiveness of the learning media. The results of the N-Gain analysis, which shows the average effectiveness of the learning media, are presented in Table 3 below.

Table 3. Results of the N-Gain Test of the Effectiveness of Learning Media

$\bar{X}$ Pretest	$\bar{X}$ Posttest	$\bar{X}$ Posttest - $\bar{X}$ Pretest	X_{max} - $\bar{X}$ Pretest	N-Gain	Kategori
108.8	163.6	54.8	71.1	78	effective

Based on the research findings, QR-Fact Learning-based learning media demonstrated a high level of effectiveness in improving students' critical thinking and fact-verification skills. This finding is supported by two main aspects: the feasibility of the research instrument and the results of effectiveness measurement using N-Gain analysis. Regarding the instrument, the results of the validity test showed that all statement items had a calculated r value greater than the r table (0.254), so all items were declared valid. This indicates that the instrument accurately represents the construct of learning media effectiveness.

Furthermore, the results of the reliability test showed a Cronbach's Alpha value of 0.81, which is included in the reliable category. This value indicates that the instrument has a good level of consistency, so that the resulting data can be trusted to measure the effectiveness of QR-Fact media. The feasibility of this instrument is an important foundation for ensuring that the research results have adequate accuracy and reliability.

Furthermore, the results of the effectiveness analysis using the N-Gain test showed a score of 78, which is included in the effective category. This value reflects a significant increase between students' initial abilities, as measured by the pretest, and their post-learning abilities, as measured by the posttest. This improvement indicates that the use of QR-Fact media has a positive impact on students' conceptual understanding and critical thinking skills in handling information in the post-truth era.

The improvement in students' fact-verification skills demonstrates that integrating visual media with digital technology can create a more active, interactive, and student-centered learning experience. Posters equipped with QR codes not only function as a medium for conveying information but also serve as a link to various digital learning resources, such as instructional videos, supporting materials, and fact-checking platforms. Through this process, students not only passively receive information but also explore, analyze, and verify the information they obtain.

These results support the Cognitive Theory of Multimedia Learning, which explains that learning is more effective when information is presented through a combination of text, visuals, and digital media, thus optimizing information processing in working memory (Mayer, 2023). These findings also align with experimental research showing that multimedia-based learning interventions

significantly improve students' ability to recognize hoaxes, verify information, and reduce the tendency to spread misinformation (Resti & Dwi, 2026).

The findings of this study align with previous research, which found that the use of digital learning media can improve students' ability to evaluate the credibility of information (Hobbs, 2024). Furthermore, fact-checking skills are known to be closely related to a person's digital literacy level, meaning that the higher the digital literacy, the better the individual's ability to recognize and verify information (Pennycook & Rand, 2023). The findings of this study demonstrate that improving fact-checking skills is influenced not only by students' digital literacy levels but also by the availability of learning media that enable students to practice verification directly.

These results reinforce research showing that Media and Information Literacy (MIL) education contributes to improved critical thinking skills, information analysis, and fact-checking skills in addressing the spread of misinformation in the digital space (Yohanis et al., 2013). In other words, learning media acts as a facilitator, bridging conceptual knowledge with the practical application of fact-checking skills.

Most previous studies have focused solely on measuring students' digital literacy or fact-checking skills without providing interventions in the form of learning media (Humprecht et al., 2020). In contrast, this study developed and tested the effectiveness of poster-based learning media integrated with QR codes, allowing students to gain hands-on learning experiences through the process of accessing, evaluating, and verifying information from various digital sources. These findings indicate that experiential learning is more effective in developing fact-checking skills than purely theoretical learning.

The effectiveness of QR-Fact Learning can also be explained through the Discipline of Verification theory, which states that verification is at the core of professional journalistic practice (Kovach & Rosenstiel, 2021). According to this theory, all information must undergo a process of checking sources, evidence, and credibility before being published. In this study, QR-Fact Learning facilitates students in implementing this process by comparing various information sources, accessing fact-checking platforms, and evaluating the validity of news stories before drawing conclusions. Thus, the developed media not only improves student learning outcomes but also fosters critical thinking skills, a key competency for journalists in the digital age.

From an Islamic communication perspective, improving fact-verification skills also demonstrates the implementation of the value of *tabayun*, namely a critical and cautious attitude in receiving and disseminating information. This value becomes increasingly relevant in the post-truth era, when personal opinions, emotions, and beliefs often outweigh objective facts in shaping public perception (McIntyre, 2023).

Therefore, QR-Fact Learning not only contributes to improving students' journalistic competency but also internalizes the ethical values of Islamic communication, such as honesty, responsibility, and verifying information before disseminating it (Hamad, 2022). These findings demonstrate that integrating digital technology with Islamic values can be a relevant learning approach in developing professional and high-integrity public communicators.

This study offers an intervention in the form of learning media that integrates posters, QR codes, instructional videos, digital materials, and a fact-checking platform within a single learning ecosystem. Thus, this study not only confirms previous findings regarding the importance of digital literacy but also expands existing research by developing learning media proven effective in improving students' fact-checking skills. This contribution is novel in its research, demonstrating

that integrating visual media with QR code technology can be an alternative journalism learning method that adapts to the challenges of the post-truth era.

The results of this study support various previous studies that suggest that media literacy interventions can improve individuals' ability to evaluate the credibility of information and reduce the tendency to believe and spread hoaxes (Graves, 2018). Furthermore, a meta-analysis of 160 studies on media literacy interventions shows that media literacy learning programs consistently have a positive impact on improving students' knowledge, critical thinking skills, and behavior in evaluating information (Humprecht et al., 2020).

From a journalism education perspective, this study also expands on previous research findings, which showed that journalism students require practice-based verification training to accurately evaluate the credibility of digital content. The use of digital verification tools has been shown to improve students' ability to distinguish between authentic news content and misinformation (Graves, 2018).

However, this study has several limitations. Effectiveness testing was conducted only on students in the Islamic Communication and Broadcasting Study Program at UIN North Sumatra, so the results cannot be generalized to a broader context. Furthermore, media effectiveness was only measured through improvements in pre- and post-test results, thus not being able to reflect changes in student behavior in consistently implementing information verification habits when using social media.

Therefore, further research is recommended using an experimental design with a control group, involving respondents from various universities, and evaluating long-term changes in fact-checking behavior. Further research could also develop QR-Fact Learning using artificial intelligence technology to adapt learning materials to the ever-evolving dynamics of disinformation spread.

CONCLUSION

This study shows that the poster-based learning media, QR-Fact Learning, effectively improves the fact-verification skills of students in the Islamic Communication and Broadcasting (KPI) Study Program at UIN North Sumatra, with an N-Gain test result of 78% (effective category). This media integrates poster visuals with interactive digital technology, providing a contextual and applicable learning experience in the post-truth era, while also instilling the value of *tabayun* (religious judgment) as an Islamic communication ethic in receiving and disseminating information.

However, this media is not yet a final solution to the growing problem of disinformation, including the challenges of artificial intelligence-based content. Further research is needed to test the sustainability of changes in student behavior and to examine the impact of this media on critical thinking skills in greater depth. Therefore, QR-Fact Learning has the potential to become a tool for developing future Islamic communicators who are critical, responsible, and possess integrity.

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