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Beyond Access to Religious Information: Religious Knowledge Evaluation among Generation Z Pre-service Teachers in Digital Environments

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Abstract (10 pt)
Akses digital terhadap informasi keagamaan kini telah menjadi hal yang umum di kalangan calon guru sekolah dasar Generasi Z, tetapi akses itu sendiri tidak serta-merta mencerminkan apakah mahasiswa mampu mengevaluasi apa yang mereka temukan. Penelitian ini melihat tiga tingkatan evaluasi informasi keagamaan: paparan (exposure), orientasi evaluasi berbasis laporan mandiri (self-reported evaluation orientation), dan penalaran terartikulasi (articulated reasoning). Metode: Kami menjalankan survei eksploratif terhadap 108 calon guru berusia 19–22 tahun (M = 20.63, SD = 1.13). Responden melaporkan pola akses mereka, menilai lima indikator orientasi evaluasi, dan menjawab pertanyaan reflektif terbuka; 56 di antaranya juga menyelesaikan wawancara tertulis. Data kuantitatif dianalisis secara deskriptif dan melalui perbandingan antar kelompok, sedangkan respons kualitatif dikodekan secara tematik. Hasil: Konten keagamaan paling sering diakses melalui TikTok (74,1%), Instagram (66,7%), dan YouTube (59,3%). Skor orientasi evaluasi tergolong lumayan tinggi (M = 3.85-4.19). Kesediaan untuk memahami pandangan yang berbeda (M = 4.19) melebihi pembandingan lintas sumber secara aktif (M = 3.85; p < 0.001), yang menunjukkan adanya celah antara keterbukaan epistemik (epistemic openness) dan verifikasi epistemik (epistemic verification). Verifikasi lintas sumber (51,9%) dan konsultasi otoritas sosial (37,0%) merupakan strategi penalaran yang paling umum. Pengguna AI generatif melaporkan pertimbangan petunjuk otoritas (authority-cue consideration) dan pembandingan lintas sumber yang lebih rendah dibandingkan non-pengguna (p = 0.002). Kesimpulan: Paparan, orientasi evaluasi, dan penalaran terartikulasi tidak bergerak secara sejalan, yang mengindikasikan bahwa literasi keagamaan digital bersifat multidimensional. Program pendidikan guru perlu membekali evaluasi informasi keagamaan secara eksplisit dalam persiapan profesional.

Keywords: literasi keagamaan digital, verifikasi epistemik, evaluasi informasi, calon guru, Generasi Z

Abstract
Digital access to religious information is now routine among Generation Z pre-service elementary teachers, but access by itself says little about whether students can evaluate what they find. This study looked at three levels of religious-information evaluation: exposure, self-reported evaluation orientation, and articulated reasoning. Methods: We ran an exploratory survey with 108 pre-service teachers aged 19-22 (M = 20.63, SD = 1.13). Respondents reported their access patterns, rated five evaluation-orientation indicators, and answered an open-ended reflective item; 56 of them also completed a written interview. Quantitative data were analyzed descriptively and through group comparisons, and qualitative responses were coded thematically. Results: Religious content was accessed most often through TikTok (74.1%), Instagram (66.7%), and YouTube (59.3%). Evaluation-orientation scores were moderately high (M = 3.85-4.19). Willingness to understand

differing views (M = 4.19) exceeded active cross-source comparison (M = 3.85; p < .001), pointing to a gap between epistemic openness and epistemic verification. Cross-source verification (51.9%) and social-authority consultation (37.0%) were the most common reasoning strategies. Generative AI users reported lower authority-cue consideration and cross-source comparison than non-users (p = .002). Conclusions: Exposure, evaluation orientation, and articulated reasoning did not move together, which suggests digital religious literacy is multidimensional. Teacher education programs should address religious-information evaluation explicitly in professional preparation.

***Keywords**: digital religious literacy, epistemic verification, information evaluation, pre-service teachers, Generation Z*

1. Introduction

Digital platforms now shape how religious knowledge is produced, circulated, and consumed. Short-form video apps, along with image- and text-based social media and messaging services, let religious content spread with a speed and reach that did not exist a decade ago. This has opened space for institutional scholars, independent preachers, and "faithfluencers" to compete for legitimacy in the same digital arena, what Bunt (2018) calls cyber-Islamic environments (Bunt, 2018; Hasanah & Sain Baharun, 2025; Zaman et al., 2025). Generation Z in particular favors short-form, visual platforms such as TikTok and Instagram as a primary way to access religious (da'wah) content, largely because these formats are concise and easy to consume (Hafiz & Neni, 2025; Jalaluddin et al., 2024).

This shift carries a specific tension: as religious information becomes easier to reach, judging its credibility gets harder. Networked digital media present users with an abundance of religious claims through features such as modality, agency, interactivity, and navigability, features that invite quick, heuristic judgment rather than careful, systematic evaluation (Sundar, 2008). Under everyday constraints of time and attention, people tend to lean on cues like authority, bandwagon, and reputation instead of checking the substance of a claim (Metzger & Flanagin, 2013; Metzger et al., 2010). In religious communication, this has been linked to a fragmentation of authority, where visibility, popularity, and algorithmic circulation increasingly compete with scholarly lineage as sources of legitimacy (Zaman et al., 2025).

Several strands of literature speak to parts of this problem without pointing to a single conclusion. Digital-literacy scholarship generally assumes that more engagement with online information environments builds the competencies needed to filter, question, and judge content critically (Eshet-Alkalai, 2004; Eshet, 2012). Epistemic-cognition research complicates that assumption: encountering conflicting information can prompt more reflective evaluation, but exposure to disagreement alone does not produce sophisticated reasoning, and readers differ considerably in how they justify their judgments when sources disagree (Barzilai & Zohar, 2012; Chinn et al., 2014). Within teacher education, this tension shows up empirically. Information-evaluation literacy is linked to pre-service teachers' confidence in their own technology-integrated teaching (Peciuliauskiene et al., 2022), yet studies that directly probe pre-service teachers' evaluative reasoning report a persistent gap between recognizing more or less credible content and being able to justify that judgment in one's own words (Kulju et al., 2024; Trixa & Kaspar, 2024). This suggests general engagement and articulated reasoning may not move together. In the Indonesian context, religious digital literacy among higher-education students has been described as present but still developing, particularly regarding the recognition of misleading or intolerant content circulated through WhatsApp, YouTube, and Instagram (Usman et al., 2023), while community-based studies of religious moderation

report a reasonable conceptual understanding that does not always translate into consistent digital practice (Kosim et al., 2024). Whether people who report strong evaluative orientations toward digital information also show equally strong epistemic verification when reasoning through concrete, conflicting religious claims remains an open question.

What this literature has not resolved is how these pieces fit together for a single population making real-time evaluative judgments. Existing self-report instruments risk conflating a general evaluative orientation, what students say they usually do, with the reasoning they actually produce when confronted with a concrete instance of conflicting religious content. Without comparing the two directly, a study can easily overstate how reflective digital religious engagement really is. We treat this as a conceptual framework to be tested rather than a finding already established: digital religious-information evaluation may be better understood as involving at least three analytically distinct layers, exposure, evaluation orientation, and articulated epistemic verification, that may align or may just as easily diverge. Examining that possible divergence, rather than assuming alignment, is the exploratory contribution this single-site study aims to make. The central phenomenon this study addresses is therefore a movement from access to epistemic discernment, examined across three levels: (1) exposure, where and how often students encounter religious information digitally; (2) evaluation orientation, what students report considering when judging such information in general; and (3) articulated reasoning, how students describe reasoning through a specific instance of conflicting religious content. To our knowledge, no prior study has documented whether these three levels move together or diverge for any pre-service teacher population, and we treat our own answer as provisional given the single-institution, single-program sample described in Section 2.

Conceptualizing Religious Knowledge Evaluation

Because this study uses several related terms, digital religious literacy, evaluation orientation, articulated reasoning, epistemic verification, we define our central construct explicitly to avoid ambiguity. We use religious knowledge evaluation to mean the process through which individuals assess the credibility, legitimacy, and interpretive validity of religious information encountered in digital environments. Consistent with the credibility-heuristic and epistemic-cognition literature above, we treat this process as covering at least five overlapping dimensions: (1) authority evaluation, judging who conveys a message and on what basis; (2) source verification, checking references or provenance; (3) cross-source comparison, weighing a claim against other accounts; (4) doctrinal verification, checking congruence with the Qur'an, hadith, or established doctrinal reasoning; and (5) contextual interpretation, attending to the circumstances and rationale behind a claim or disagreement. This five-dimension structure draws on general credibility-heuristic and information-literacy scholarship, but several dimensions also have long-standing, more specific analogues within Islamic epistemology. Source verification (dimension 2) resonates with the classical concern for isnad, the chain of transmission used to establish a report's provenance and reliability, while cross-source comparison (dimension 3) resonates with the practice of tabayyun, deliberate verification before accepting or acting on a report, a term one respondent invoked directly (P17, Section 3.4). We draw this correspondence to sharpen, not to claim equivalence with, the specifically Islamic epistemological resonance of dimensions that might otherwise read as a generic information-literacy taxonomy applied to religious content. A fuller treatment of these classical concepts sits beyond this study's scope and is noted as a direction

for future, more theologically grounded work. The five evaluation-orientation indicators and six reasoning categories used in this study, described in Section 2, were built to map onto these dimensions. Religious knowledge evaluation is therefore the umbrella construct that the study's specific measures and codes approximate, not a separate variable measured on its own. We treat these five dimensions as analytical categories for interpreting findings rather than as validated psychometric subscales. No factor-analytic or other psychometric procedure was used to derive or confirm them, so they should be read as a conceptual organizing scheme rather than as measurement subdomains with established construct validity.

This population matters for a specific, bounded reason. Pre-service elementary teachers in the Pendidikan Guru Sekolah Dasar (PGSD) program are themselves Generation Z digital natives, and their professional preparation will later require them to help elementary pupils, who are growing up in an even more saturated digital environment, develop sound information habits. We do not claim to measure teaching competence or downstream pupil outcomes; instead, we treat pre-service teachers' own evaluative reasoning as a relevant marker of the professional preparation they bring into the classroom.

Theoretically, this study is anchored mainly in the credibility heuristic-processing tradition, Sundar's (2008) MAIN model and Metzger and Flanagin's (2013) account of cognitive heuristics in online credibility judgment, which explains why users might rely on source- and popularity-based cues under conditions of information abundance. Digital-literacy theory (Eshet-Alkalai, 2004; Eshet, 2012) and epistemic-cognition research on evaluating conflicting sources (Barzilai & Zohar, 2012; Chinn et al., 2014) serve as a contextual lens for interpreting the reasoning strategies respondents describe. Religious literacy and teacher-education implications are treated as an interpretive, educational layer built on top of the empirical findings rather than as a directly measured construct. We did not administer a validated religious-literacy instrument, so our conclusions about digital religious literacy are offered as conceptual interpretation rather than as measurement claims.

Building on this framing, the study addresses four research questions: (RQ1) How do pre-service teachers encounter and access religious information across digital platforms? (RQ2) What evaluative criteria and practices do they report using when assessing digitally mediated religious information? (RQ3) How do pre-service teachers articulate their reasoning when confronted with religious information that conflicts with their prior understanding? (RQ4) What patterns emerge when self-reported evaluation orientations are compared with participants' articulated reasoning? RQ4 sits at the analytic heart of the study: Results test whether the three proposed layers align or diverge (Section 3), Discussion interprets why such alignment or misalignment might occur (Section 3.7), and the Conclusion returns to the layered framework in light of the evidence (Section 4). It is at the level of comparing layers, rather than in any single measure, that the distinction between access and epistemic discernment becomes visible. We treat this layered view as the study's exploratory conceptual proposal, offered for testing in future, larger-scale work rather than as an established finding in itself.

2. Method

This study used an exploratory survey design that combined descriptive analysis of closed-ended quantitative items with thematic analysis of open-ended qualitative responses collected within the same questionnaire. Rather than labeling this a formal mixed-methods design, we treat the two strands as complementary evidence integrated at the level of

interpretation: self-reported evaluation orientation (quantitative) is read alongside articulated reasoning (qualitative) to examine whether the two align or diverge (RQ4). This framing avoids overstating the design while preserving the value of comparing what respondents say they generally do with how they reason through a concrete evaluative scenario.

a. Participants

Participants were 108 students enrolled in the PGSD program, ranging in age from 19 to 22 years (M = 20.63, SD = 1.13), an age range commonly associated with Generation Z. This study treats participants as a Generation Z cohort based on directly reported age rather than academic level alone, while recognizing that generational category boundaries are conventions rather than precise cutoffs. Respondents were drawn from Semester 5 (n = 48; 44.4%) and Semester 7 (n = 60; 55.6%), distributed across four class cohorts (PGSD 1-4). All 108 respondents gave informed consent and completed the full closed-ended questionnaire together with one open-ended reflective item; 56 of these respondents (51.9%) also volunteered for a deeper written interview consisting of three further open-ended items. Participants were recruited through convenience sampling via an online questionnaire distributed to active PGSD students.

b. Instrument and Data Structure

The questionnaire had a layered structure worth stating precisely, since it determines which analyses apply to which n. All 108 respondents answered: (a) demographic items (age, semester, class); (b) digital access items, covering the platforms used, frequency of encountering religious information, and the type of religious content most often sought; (c) five 5-point items ("not suitable" to "very suitable," scored 1-5) capturing self-reported evaluation orientation, namely considering the communicator's identity, checking sources or references, comparing information across sources, seeking the rationale behind differing views, and awareness of algorithmic or popularity influence, adapted conceptually from Sundar's (2008) MAIN model and Eshet-Alkalai's (2004) digital-literacy framework; and (d) one open-ended reflective item asking respondents to describe what they would typically do before trusting or sharing digital content that conveyed religious teaching different from their existing understanding. This reflective item yields articulated-reasoning data at the full sample level (n = 108), not only for the volunteer sub-sample.

We do not call the five evaluation-orientation items a validated scale. They were developed for this study and adapted conceptually, rather than empirically validated, from the credibility-heuristic and digital-literacy literature; no formal content-validation procedure (expert panel review, cognitive interviewing, or pilot factor analysis) preceded data collection. We describe them instead as five exploratory indicators of self-reported evaluation orientation, reported mainly through item-level descriptive statistics, an exploratory internal-consistency coefficient, and inter-item correlations. Where an unweighted mean of the five items (the "composite") is reported in Section 3.3, it functions strictly as a descriptive summary index for comparing two groups' overall response level on the item set as a whole, not as a validated construct score, and any interpretation of the composite is treated as secondary to the item-level results; where the composite and item-level results diverge, the item-level results carry interpretive priority.

A voluntary sub-sample of 56 respondents also completed a written interview with three further open-ended items: (e) the criteria that make a religious information source

trustworthy or untrustworthy; (f) an account of an actual instance of encountering two differing religious opinions and how the respondent decided which to follow; and (g) the competencies respondents consider most important for university students, not only to locate religious information online, but also to judge its trustworthiness and understand it accurately. Item (f) served mainly as a triangulation check against the full-sample reflective item described above, and its content converged with the patterns reported for that item. Because volunteering for this deeper interview was self-selected, we compared the 56 volunteers against the 52 non-volunteers on all five evaluation-orientation indicators; the two groups differed significantly only on cross-source comparison ($M = 4.00$ vs. 3.85; Welch $t = 2.02$, $p = .046$, uncorrected), with no differences on the remaining four indicators or the composite (all $p > .16$). We note this single, uncorrected difference as a modest self-selection signal, volunteers may be marginally more inclined toward cross-checking, and treat it as a limitation on how far the written-interview findings (Section 3.5) can be assumed representative of the full sample, rather than as evidence of a systematic bias across all indicators.

c. Data Analysis

Quantitative items were analyzed descriptively (frequencies, percentages, means, medians, standard deviations, and full response distributions across the 1-5 scale) for the full sample ($n = 108$). As an exploratory internal-consistency check, not as confirmation of a validated scale, Cronbach's alpha was computed across the five evaluation-orientation items ($\alpha = .70$). Because two items were theoretically positioned as capturing conceptually distinct evaluation dimensions (understanding the rationale behind differing views versus actively comparing information across sources), a paired-samples t-test tested whether their means differed, directly addressing RQ4 at the quantitative level. A Wilcoxon signed-rank test was also run as a distribution-free robustness check given the ordinal nature of the underlying items, and effect size (Cohen's d_z) with a 95% confidence interval for the mean difference is reported alongside both tests. Exploratory bivariate associations between the five indicators (plus their unweighted composite mean) and (i) generative-AI use, (ii) frequency of digital religious-information exposure, (iii) platform breadth, and (iv) semester were examined using Welch's independent-samples t-tests (which do not assume equal variances, appropriate given the unequal group sizes for AI use) and Spearman rank correlations, respectively, with Cohen's d and 95% confidence intervals reported for the group comparisons. Platform breadth was operationalized as the number of distinct platform categories a respondent selected from the ten listed options (TikTok, Instagram, YouTube, podcasts, WhatsApp/Telegram, Google/search engines, religious websites/blogs, other platforms, generative AI, and Facebook), with WhatsApp/Telegram counted as one category and generative AI counted as one category regardless of which specific tool was named. Because this produced 24 bivariate tests across the four exploratory families (AI use, frequency, platform breadth, semester × five indicators and their composite), we also applied a Benjamini-Hochberg false-discovery-rate (FDR) correction across all 24 tests. Results are reported with both raw and FDR-adjusted p-values, and only associations surviving FDR correction are treated as robust exploratory findings rather than as findings that merely cross the uncorrected .05 threshold. Given the study design, quantitative analyses were used to identify patterns, contrasts, and associations rather than to evaluate a formal causal model. Consequently, statistically significant findings are

interpreted as indications of potential relationships and should not be read as evidence of causation.

Open-ended responses were analyzed using a two-cycle thematic coding process guided by a codebook developed specifically for this study. In the first, inductive coding pass, responses to the full-sample reflective item (n = 108) were read repeatedly and coded openly to generate initial categories. In a second, focused coding pass, these initial categories were reviewed, consolidated, and refined, informed by the credibility-heuristic and epistemic-cognition literature, into six analytically distinct categories with explicit operational definitions (summarized in Table 3): (1) source-based heuristic reasoning (trusting based on the communicator's popularity, familiarity, or follower count); (2) social-authority verification (consulting a lecturer, religious teacher, or parent); (3) cross-source verification (actively searching for and comparing additional sources); (4) textual/doctrinal verification (checking directly against the Qur'an, hadith, or established doctrinal basis); (5) contextual interpretation (re-reading, considering context, or seeking the rationale behind a difference); and (6) belief-preserving response (maintaining a prior belief without further verification). Because a single response could reasonably contain more than one reasoning strategy, multiple coding was explicitly permitted at the level of the individual participant response, so categories are not mutually exclusive and one response could receive zero, one, or several codes; consequently, the percentages reported for this item do not sum to 100%. Responses to this item were brief (M = 23.8 words, Mdn = 15, range = 2-64), which bears directly on how much interpretive weight a six-category scheme can carry from a single question. As a check, 48.1% of responses received exactly one code, 37.0% received two or more codes, and 14.8% received none (reported separately as undifferentiated), which indicates multiple coding was a substantive feature of the data rather than a rare exception. The first author coded the open-ended data following the codebook, refining category definitions iteratively during the second pass as borderline responses came up. Because a second, independent coder was not available for this dataset, no formal inter-rater reliability statistic (e.g., Cohen's kappa) is reported; we state this explicitly as a limitation rather than substituting an unsupported reliability claim. We deliberately distinguish source-based heuristic reasoning (category 1) from social-authority verification (category 2): the former reflects reliance on popularity or familiarity as a proxy for credibility, while the latter reflects a legitimate epistemic practice of consulting a qualified religious authority. Conflating the two would misrepresent consultation with teachers or religious scholars as a heuristic weakness rather than a recognized form of verification.

d. Ethical Considerations

Participation was voluntary and anonymous. All respondents gave informed consent before completing the questionnaire, and participants who declined the deeper written interview remained included in all full-sample analyses based on their initial responses.

3. Results and Discussion

a. Sample Characteristics

Table 1 presents the distribution of respondents by age, semester, and class. The full sample fell within a 19-22-year age range (M = 20.63, SD = 1.13), an age range

commonly associated with Generation Z, which supports the study's Generation Z framing with directly reported age data rather than academic level alone.

Table 1. Sample characteristics (n = 108)

Characteristic	n / M	% / SD
Age (years), M (SD)	20.63	1.13
Age range	19–22	—
Semester 5	48	44.4%
Semester 7	60	55.6%
PGSD 1	16	14.8%
PGSD 2	28	25.9%
PGSD 3	48	44.4%
PGSD 4	16	14.8%

b. **RQ1: Exposure to Religious Information**

As shown in Figure 1, TikTok (74.1%), Instagram (66.7%), and YouTube (59.3%) were the platforms most often used to access religious information, followed by podcasts (44.4%) and WhatsApp/Telegram groups (40.7%). Notably, 22.2% of respondents reported using generative AI tools (e.g., ChatGPT, Gemini, or Claude) to obtain religious information, which shows conversational AI has already entered this cohort's religious-information ecology alongside conventional social media; Section 3.3 examines whether this use is associated with a different evaluation orientation.

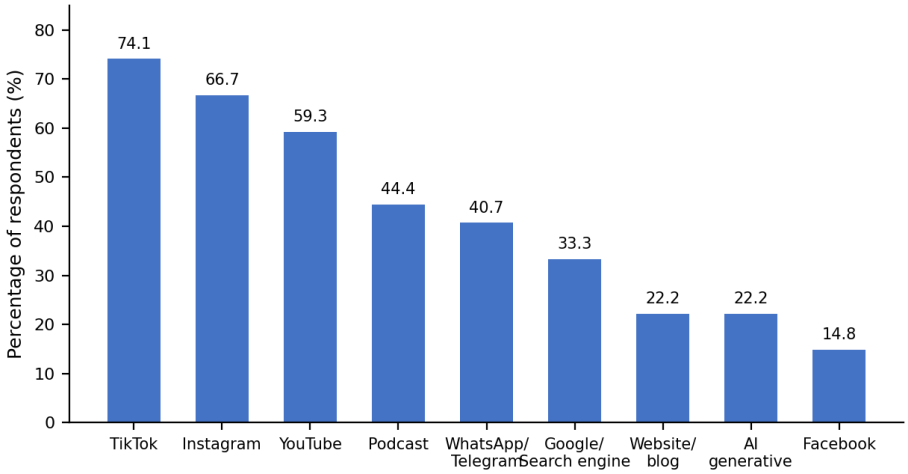


Figure 1. Digital platforms used to access religious information (n = 108, multiple responses).

More than half of the respondents (55.6%) reported encountering or searching for religious information "often" or "very often," 33.3% reported "sometimes," and 11.1% reported "rarely," confirming that digital religious content is a routine part of respondents' information environment regardless of academic seniority (Section 3.3 shows no significant semester-based differences). On content type, the most frequently

sought information concerned morals and daily conduct (akhlak, 81.5%), followed by worship practice (ibadah, 48.1%), Islamic jurisprudence (fikih, 40.7%), and Islamic history and figures (29.6%); more specialized content such as Qur'anic exegesis (22.2%), religious moderation or differing viewpoints (22.2%), contemporary socio-religious issues (14.8%), and hadith (7.4%) were sought less often. This pattern shows exposure is high and practically oriented, but it says nothing by itself about how that content is evaluated, the question taken up next.

c. **RQ2: Self-Reported Evaluation Orientation**

Table 2 presents descriptive statistics for the five exploratory indicators of self-reported evaluation orientation, including the full response distribution across the 1-5 scale. An exploratory internal-consistency check across the five items yielded Cronbach's α = .70, an acceptable but modest value for a small, study-specific item set; we report this as a descriptive property of the indicators, not as evidence that they form a single validated construct.

Table 2. Self-reported evaluation-orientation indicators, including full response distribution (n = 108)

Indicator	M	SD	Mdn	% 3 / 4 / 5
Considering who conveys the information (authority cue)	4.11	0.79	4	25.9 / 37.0 / 37.0
Checking the source or references used	3.93	0.82	4	25.9 / 44.4 / 25.9*
Comparing information with other sources before trusting/sharing	3.85	0.81	4	29.6 / 44.4 / 22.2*
Seeking the rationale behind differing understandings	4.19	0.73	4	18.5 / 44.4 / 37.0
Awareness that popularity/algorithms can shape judgment	4.04	0.84	4	22.2 / 40.7 / 33.3*

Note: A small proportion of respondents (3.7% for three indicators marked with an asterisk) scored 2 ("not suitable"); no respondent scored 1 on any indicator. Percentages shown are for scale points 3, 4, and 5.

All five indicators show moderately high means (3.85-4.19 of 5). Read descriptively, the highest-rated indicator was seeking the rationale behind differing religious understandings (M = 4.19), and the lowest, though still above the midpoint, was comparing information across multiple sources before trusting or sharing it (M = 3.85). Because these two indicators were designed to capture conceptually distinct evaluation dimensions, epistemic openness (willingness to understand why views differ) versus epistemic verification (actively checking multiple sources), we tested this apparent gap directly with a paired-samples t-test, which confirmed that the two means differed significantly, $t(107) = 4.01$, $p < .001$, mean difference = 0.33, 95% CI [0.17, 0.50], $d_z = 0.39$ (a small-to-moderate effect); a distribution-free Wilcoxon signed-rank test corroborated this result ($W = 204.0$, $p < .001$). To our knowledge, this is the clearest single quantitative indication in this dataset that self-reported willingness to engage with disagreement does not automatically extend to active, effortful cross-checking,

and it motivates the epistemic openness/epistemic verification distinction used throughout the rest of the paper. The fourth-highest-rated indicator, awareness that popularity, followers, or algorithms can shape judgment (M = 4.04), deserves a separate note: it is the only item in this study that speaks, even indirectly, to algorithmic curation of the kind discussed in the filter-bubble literature (Pariser, 2011), and a relatively high self-reported awareness of this influence does not by itself indicate whether respondents' actual platform exposure is narrowed by recommendation algorithms, something this study did not measure directly.

Three further exploratory patterns are relevant to RQ2, examined across 24 bivariate tests with Benjamini-Hochberg FDR correction applied. First, generative-AI users (n = 24, 22.2% of the sample) reported lower scores than non-users (n = 84) on considering the communicator's identity (M = 3.67 vs. 4.24; diff = -0.57, 95% CI [-0.93, -0.22]; Welch t = -3.25, p = .0025, FDR p = .030, d = -0.76) and on cross-source comparison (M = 3.50 vs. 3.95; diff = -0.45, 95% CI [-0.73, -0.17]; Welch t = -3.24, p = .0019, FDR p = .030, d = -0.57); both differences survived FDR correction. The composite mean of all five items did not differ significantly between AI users and non-users (M = 3.87 vs. 4.07; Welch t = -1.70, p = .096, FDR p = .46, d = -0.37), and the remaining three individual indicators also showed no significant difference. We do not read this as evidence that AI use causes weaker evaluation, nor that AI use is associated with weaker evaluation overall, since the composite and three of five indicators showed no reliable difference. AI users reported lower scores specifically on two source-oriented indicators; we report this as an association worth monitoring as generative AI use grows, not as a causal or general claim about AI-mediated religious information. Second, frequency of digital religious-information exposure and platform breadth (the number of distinct platform categories used; see Method) showed two nominally significant correlations before correction, frequency with algorithm/popularity awareness (Spearman r = .203, p = .036) and platform breadth with source/reference-checking (Spearman r = .244, p = .011), but neither survived FDR correction (FDR p = .21 and .09, respectively) and are therefore treated as null after adjustment for multiple comparisons rather than as robust findings. Semester showed no significant differences on any indicator before or after correction (all raw p > .76), ruling out a simple effect of academic seniority within this two-semester sample.

d. **RQ3: Articulated Reasoning About Divergent Religious Content**

When asked, in an open-ended format, what they would typically do before trusting or sharing digital content that conveyed religious teaching different from their existing understanding, all 108 respondents gave a codable response. Table 3 summarizes the six-category thematic coding of these responses; because multiple codes could be assigned to a single response, percentages do not sum to 100%.

Table 3. Coding scheme and articulated reasoning strategies from the full-sample reflective item (n = 108; multiple coding permitted, coding unit = participant response, categories not mutually exclusive)

Category	Operational definition	n	%
Cross-source verification	Actively searches for and compares additional sources before trusting/sharing	56	51.9

Social-authority verification	Consults a lecturer, religious teacher (ustadz/ustadzah), or parent to check the content	40	37.0
Contextual interpretation	Re-reads, considers context, or seeks the rationale behind a difference	24	22.2
Textual/doctrinal verification	Checks directly against the Qur'an, hadith, or an established doctrinal basis	12	11.1
Source-based heuristic	Trusts based on the communicator's popularity, familiarity, or follower count, with no further checking step described	4	3.7
Belief-preserving response	Maintains a prior belief or understanding without describing any verification step	4	3.7
Undifferentiated	Response too brief or ambiguous to assign confidently to any of the above categories	16	14.8

Cross-source verification (51.9%) and social-authority verification (37.0%) were the two most common reasoning strategies. It is important not to treat these as interchangeable with the source-based heuristic category: source-based heuristic reasoning (3.7%) reflects trusting a message mainly because of the communicator's popularity or familiarity, while social-authority verification reflects the substantively different practice of deliberately consulting a qualified religious teacher, lecturer, or parent to check the content itself, a legitimate epistemic strategy in religious knowledge, not merely a popularity heuristic. A smaller share of responses referred directly to scriptural sources (11.1%) or paused to interpret the context and rationale behind a disagreement (22.2%). Only 3.7% of responses were coded as belief-preserving (maintaining a prior view without further verification); a further 14.8% of responses were too brief or ambiguous to assign confidently to any of the six categories and are reported separately as undifferentiated (Table 3).

A small set of verbatim responses (translated from Indonesian, anonymized as P01-P19) illustrates these categories. Source-based heuristic: "I look at who is delivering it" (P01), relying on identity alone, with no further checking step. Social-authority plus doctrinal verification: "I would first verify (tabayyun) by checking the source, Qur'anic and hadith evidence, and asking a competent teacher or ustadz before trusting or sharing it" (P17), which shows these categories often co-occur rather than substitute for one another. Cross-source verification: "I check the source and compare it with information from trustworthy religious sources" (P14). Contextual interpretation: "I look for broader information, not to blame the source but to see it from a different perspective; if it differs from what I understand, I respect it and treat it as additional insight" (P04). Belief-preserving response: "I will hold firmly to what I already understand and believe" (P07), which, unlike the previous examples, describes no verification step at all.

For the sub-sample who completed the deeper written interview (n = 56), a separate item asked about an actual, rather than hypothetical, experience of encountering two differing religious opinions. Responses converged with the patterns above, cross-source comparison and consultation with a credible source or authority

were again dominant, providing descriptive triangulation for the full-sample reflective item.

e. **Perceived Trust Criteria and Competency Needs (n = 56)**

Table 4 summarizes the criteria the written-interview sub-sample used to judge whether a religious information source could be trusted.

Table 4. Perceived trust criteria for religious information (n = 56)

Criterion	n	%
Source or institution is clear and credible	28	50.0
Communicator's credentials, reputation, or follower count	24	42.9
Congruence with Qur'an, hadith, or established doctrinal basis	16	28.6
Content is not provocative or misleading	16	28.6

Half of the sub-sample pointed to the clarity and credibility of the source or institution, while 42.9% referred to the communicator's credentials, reputation, or follower count, cues that correspond to the authority and bandwagon heuristics described in the MAIN model, where visible follower counts and engagement metrics can serve as proxies for credibility (Sundar, 2008). Only 28.6% explicitly mentioned checking congruence with the Qur'an, hadith, or an established doctrinal basis. As in Section 3.4, this should not be read as meaning authority-based judgment is inherently superficial: where respondents described checking a communicator's religious credentials or institutional affiliation specifically to establish competence, this reflects legitimate authority-based verification; where they described trusting based on popularity or follower count alone, this reflects the authority/bandwagon heuristic. The two were not always distinguishable from short survey responses alone, itself a methodological limitation noted in Section 3.7.

Table 5 summarizes the competencies this sub-sample considered most important for university students to not only find religious information online, but also assess its trustworthiness and understand it accurately.

Table 5. Competencies perceived as most needed (n = 56)

Competency	n	%
Critical thinking	40	71.4
Digital literacy	36	64.3
Source-verification skills	24	42.9
Openness and tolerance toward differing views	8	14.3

Critical thinking (71.4%) and digital literacy (64.3%) were, by a wide margin, the two most frequently cited competencies, often mentioned together in respondents' own words rather than as separate skills. This self-identified need lines up with the holistic

digital-literacy framework, in which information thinking, the capacity to consume information critically and filter out biased or false content, is positioned as a core component of digital functioning (Eshet-Alkalai, 2004; Eshet, 2012), and with the finding that pre-service teachers' perceived information-evaluation literacy relates to their confidence in teaching with technology (Peciuliauskiene et al., 2022). Whether this self-identified need is matched by the reasoning actually articulated in Section 3.4 is examined next.

f. **RQ4: Comparing Evaluation Orientation with Articulated Reasoning**

Read on its own, Table 2 could suggest a fairly reflective information user: means of 3.85-4.19 out of 5 across all five orientation indicators, and 74.1% or more of respondents rating four of the five indicators as "suitable" or "very suitable." Table 3 complicates this picture. Cross-source verification was the most frequently articulated strategy when respondents described their reasoning through one concrete scenario (51.9%), yet it appeared less prevalent than respondents' self-reported endorsement of evaluative practices in Table 2 would suggest; a further minority (3.7% belief-preserving, plus part of the 14.8% undifferentiated group) described no clear verification step at all, even though none of these same respondents had rated themselves as low ("not suitable") on the corresponding orientation item. We call this pattern an orientation-reasoning discrepancy (or self-report-reasoning discrepancy) rather than an intention-behavior gap, because Q13 remains a self-reported response to a hypothetical scenario, not an observation of actual behavior; we did not measure what respondents would do in a real, unguided information-seeking situation, only what they say they would do. This distinction matters methodologically: claiming to have observed an intention-behavior gap would overstate what an all-self-report design can support, while an orientation-reasoning discrepancy is directly evidenced by the data, the paired-samples result in Section 3.3 and the qualitative distribution in Section 3.4 converge on the same conclusion using two independent measures within the same self-report framework.

g. **Discussion: From Access to Epistemic Discernment**

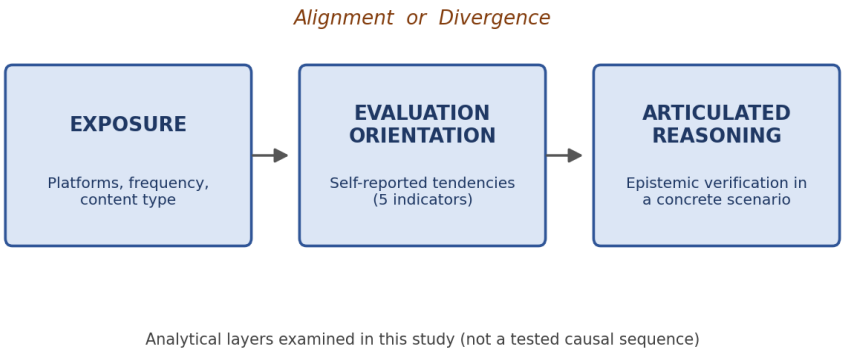


Figure 2. Proposed conceptual framework relating exposure, evaluation orientation, and articulated reasoning, derived from the findings of the present study. The three boxes denote analytically distinct layers examined here, not a tested causal or structural sequence; arrows indicate the order in which layers were assessed in this study's instrument, and the framework's central claim is that the layers may show alignment or divergence.

We propose that religious-information evaluation is more usefully conceptualized as a layered process than as a single, unitary competence inferred from access or general self-report. The findings below move from the empirical pattern to its conceptual implication.

Before turning to individual findings, it is worth stating explicitly why an evaluation-orientation item and an articulated-reasoning task would be expected to diverge in the first place, since this expectation is what motivates treating them as separate layers rather than as two measures of the same thing. Evaluation-orientation items such as those in Table 2 mainly capture endorsement of an evaluative norm, a respondent's agreement that comparing sources, checking references, or considering who conveys a message is the right thing to do, whereas the articulated-reasoning item in Table 3 requires respondents to perform, in their own words, some of the actual epistemic work those norms describe. Endorsing a norm is cognitively cheap: it only requires that a respondent recognize a statement as describing good practice. Performing the corresponding epistemic work, actively recalling or constructing a verification strategy for a specific, conflicting claim, is more demanding, and demanding tasks are, all else equal, less likely to be completed consistently than the norms describing them are to be endorsed. On this account, the orientation-reasoning discrepancy documented in Section 3.6 is not an anomaly to be explained away but a broadly expected consequence of asking two structurally different kinds of question, one about what a respondent believes is good practice, the other about what a respondent can produce as evidence of that practice. Treating the two as interchangeable measures of "evaluation habit" would obscure precisely this distinction. This is what gives the three-layer framework in Figure 2 its explanatory, rather than purely descriptive, character: divergence between layers is not simply reported as a gap but anticipated by the different cognitive demands each layer places on respondents.

Within this cohort, exposure to digital religious content is frequent and widespread: more than half of respondents (55.6%) reported encountering such content often or very often, across multiple platforms, regardless of semester. Exposure alone, though, appears insufficient to indicate the quality of digital religious-information evaluation; a three-layer conceptual framework distinguishing exposure, evaluation orientation, and epistemic verification is useful for describing what is happening beyond access itself, without implying that these layers were tested as a causal or structural sequence.

Credibility judgments in this cohort draw on both source-level heuristics (popularity, follower count, familiarity) and legitimate social-authority verification (consulting qualified teachers or scholars), and the two were not always separable in short responses. Credibility here is socially constructed through a mixture of platform-mediated heuristics and substantively legitimate consultation practices; treating all authority-based reasoning as a heuristic weakness would misrepresent an epistemic practice with genuine standing in religious knowledge traditions, and future instruments should separate the two more cleanly at the item level.

Self-reported epistemic openness (understanding why views differ) was significantly higher than epistemic verification (actively comparing sources), echoed qualitatively in the lower rate of explicit cross-checking in the reflective item than the

orientation scores alone would predict. Openness to disagreement and active verification appear to be distinguishable evaluation dimensions rather than a single "evaluation habit"; conflating them risks over-crediting students with competence not yet demonstrated in a concrete scenario. This discrepancy is documented at the aggregate (group-mean) level; we did not run an individual-level difference-score analysis, so we do not claim every respondent who scored high on openness necessarily scored low on verification. Three complementary theoretical accounts may explain why openness would exceed verification specifically. From an epistemic-cognition perspective, individuals may be willing to acknowledge the legitimacy of alternative viewpoints without necessarily engaging in the more cognitively demanding process of weighing evidence across multiple sources (Barzilai & Zohar, 2012; Chinn et al., 2014). From a bounded-rationality perspective, verification requires more cognitive effort than openness, making it less likely to be consistently enacted under the everyday time and attention constraints of digital environments. From a heuristic-processing perspective, users may endorse critical-evaluation norms in the abstract while still defaulting to simpler source- and popularity-based cues once confronted with real informational complexity (Metzger & Flanagin, 2013; Sundar, 2008). These accounts are not mutually exclusive and the present data cannot adjudicate between them, but together they suggest the openness-verification discrepancy is a theoretically anticipated pattern rather than an artifact specific to this sample.

Respondents themselves named critical thinking and digital literacy as the competencies most needed, and generative-AI use (n = 24, 22.2% of the sample) was associated with lower self-reported scores on two source-oriented indicators, considering the communicator's identity and cross-source comparison, though not on the composite score or the other three indicators. Recognizing a competency gap is not the same as consistently enacting it; the orientation-reasoning discrepancy above shows that naming a needed skill and reliably applying it are separate outcomes, and AI users reported lower scores on these two specific indicators without a corresponding overall difference in evaluation orientation. We report this as an association worth monitoring as generative AI use grows, not as a causal or general claim about AI use weakening evaluation.

1) Generative AI and Epistemic Outsourcing

The generative-AI finding merits closer attention on its own terms, though it also calls for particular caution in interpretation. The lower tendency among AI users to consider the communicator's identity and to engage in cross-source comparison may reflect an emerging form of epistemic outsourcing, in which the cognitive work of gathering, weighing, and reconciling multiple sources shifts from the user to the AI system, which returns a single synthesized answer rather than a set of sources to be independently evaluated. This interpretation fits the broader idea of cognitive offloading, in which people reduce their own information-processing effort by delegating parts of a task to an external tool once that tool is perceived as reliable enough to trust. If a generative-AI answer is perceived this way, the perceived need for further verification, checking who originally said something, or comparing it against other sources, would be expected to drop, independent of any change in a respondent's underlying

evaluative skill or motivation. Put differently, generative AI may not necessarily make students worse at evaluating religious information; it may instead change which parts of the evaluative process students feel are still theirs to do, with source identification and cross-checking increasingly treated as the tool's job rather than the user's.

An equally plausible alternative, however, directly undercuts this framing: rather than AI use causing weaker verification, students who already verify less, for reasons unrelated to AI, such as lower baseline interest in cross-checking religious content, may simply be more inclined to adopt AI tools in the first place, in which case the association reflects selection rather than any effect of AI on evaluation practice. A third possibility is that both processes operate together and reinforce one another over time: students with a lower baseline inclination to verify adopt AI tools, and subsequent reliance on synthesized answers further reduces whatever verification tendency they had. Because the AI-user subgroup was small (n = 24) and this study is cross-sectional and correlational, causal conclusions cannot be drawn, and the present data cannot adjudicate between these directions. The "epistemic outsourcing" label is therefore offered as one plausible interpretation to motivate future research, not as an established mechanism. What the finding does establish, more modestly, is that generative-AI use and lower scores on two specific, source-oriented evaluation indicators co-occur in this sample, itself a novel empirical observation for the digital religious-literacy literature, and one with growing relevance as generative-AI tools become more embedded in everyday information seeking generally, not only in religious contexts. The finding still raises a question of increasing relevance for Islamic teacher education specifically: as generative-AI tools become a routine part of students' religious-information ecology alongside social media, how future teachers are prepared to verify AI-synthesized religious content, rather than treating it as a self-evidently authoritative answer, may become as important as verifying content from human influencers or institutions.

Taken together, these findings extend prior research in two ways. First, where previous studies of Indonesian digital religious literacy have relied mainly on qualitative or library-based designs focused on general student populations or da'wah content strategy (Choirin et al., 2024; Kosim et al., 2024; Susanti et al., 2025; Usman et al., 2023), this study contributes demographically substantiated, item-level evidence specific to pre-service elementary teachers, together with an explicit comparison between self-reported orientation and articulated reasoning. Second, by treating epistemic openness and epistemic verification as separable evaluation dimensions and testing the distinction statistically, this study offers a conceptual refinement of what "evaluation habit" self-report items actually capture, echoing, in a religious-information setting, similar cautions raised when pre-service teachers in other national contexts were asked to justify rather than merely rate their credibility judgments (Kulju et al., 2024; Trixa & Kaspar, 2024). The central argument that emerges is that high exposure and a favorable self-reported evaluation orientation do not necessarily translate into equally strong articulated epistemic verification, a more precise claim than simply noting that students use

digital media often, and one we propose treating as a layered process rather than as a unitary competence (Figure 2).

We deliberately frame the educational implication of this study around professional preparation rather than downstream classroom impact, since the data measure pre-service teachers' own reasoning, not their teaching practice or any effect on pupils. Teacher education programs should consider treating digital religious-information evaluation as an explicit part of pre-service teachers' professional preparation, covering the distinction between legitimate authority-based verification and popularity-based heuristics, deliberate cross-source checking, and doctrinally grounded verification, so that future teachers enter the profession having practiced, not merely recognized, these competencies. This framing intentionally stops short of asserting that such preparation will directly produce discernment in pupils, a claim this design cannot support.

h. **Implications for Islamic Education**

More broadly, these findings suggest contemporary Islamic education is confronted with a shift from transmission-oriented religious authority, historically anchored in scholarly lineage and institutional standing, toward a more distributed and platform-mediated authority structure. Legitimacy here is increasingly negotiated not only through algorithmic visibility, popularity, and digital participation alongside traditional credentials, but also through peer networks, where a claim gains credibility partly because it circulates within a trusted circle of friends or family, as the social-authority verification findings in Section 3.4 suggest, and, increasingly, through AI-generated synthesis, in which a single generated answer can stand in for what was previously a multi-source, multi-authority process of establishing a religious claim's standing (Bunt, 2018; Hasanah & Sain Baharun, 2025; Zaman et al., 2025). We see this as a conceptual point in its own right and not only a preface to curricular recommendations: it implies that the object Islamic education needs to prepare pre-service teachers to navigate is not a fixed set of authoritative sources to be verified against, but a continuously shifting field in which algorithmic curation, peer circulation, and AI synthesis each reshape what counts as an accessible, credible-seeming account of religious knowledge. Framed this way, the practical question is not only "should students be taught digital literacy" but "how is religious authority itself being renegotiated in the environments these future teachers and their pupils inhabit, and what does evaluating credibility mean under that renegotiation." The data suggest three more concrete, curricular-level implications that follow from this broader shift. First, verification of digitally encountered religious content in this cohort is not a single behavior but a mixture of practices with different epistemic standing: consulting a lecturer, ustadz/ ustadzah, or parent (37.0% of reflective responses; Table 3) is a substantively different act from trusting a source because of its popularity or follower count (3.7%), and Islamic education curricula should teach this distinction explicitly rather than treating all authority-based reasoning as equivalent. Second, only 11.1% of reflective responses and 28.6% of the written-interview trust criteria referred directly to checking congruence with the Qur'an, hadith, or an established doctrinal basis; strengthening pre-service teachers' capacity and disposition to anchor evaluation in textual and doctrinal grounds, alongside, not instead of, social-authority consultation, is a plausible curricular target. Third, teachers (ustadz/ustadzah) and lecturers were

themselves identified by respondents as legitimate epistemic authorities to consult; Islamic teacher education programs are therefore well positioned to formalize this role, explicitly preparing pre-service teachers both to model doctrinally grounded verification themselves and to serve as one of the credible authorities their own future pupils and communities may turn to when evaluating digital religious content, including content generated or summarized by AI. We offer these as curricular directions consistent with the data rather than as tested interventions, since this study did not evaluate any teaching program.

This study has several limitations. First, all data are self-report; the reflective item captures how respondents describe reasoning through a hypothetical scenario, not observed behavior, which is why we adopt the term orientation-reasoning discrepancy rather than intention-behavior gap, and this discrepancy is documented at the aggregate rather than individual level. Second, the five evaluation-orientation indicators are exploratory, single-item dimensions rather than a validated multi-item scale; the internal-consistency coefficient reported here (α = .70) describes these specific items in this specific sample and should not be generalized as evidence of a validated construct. Third, a single coder conducted the qualitative coding using an explicit codebook with iterative refinement, but without a second, independent coder; no formal inter-rater reliability statistic is reported, and this is a limitation rather than an oversight to be minimized. Fourth, although we applied Benjamini-Hochberg FDR correction across the 24 exploratory bivariate tests in Section 3.3, which showed that only the two AI-use associations survived correction, while the frequency and platform-breadth correlations did not, these analyses remain exploratory and hypothesis-generating, run on a modest AI-user subgroup (n = 24), rather than confirmatory. Fifth, the sample was drawn from a single PGSD program, which limits generalizability to other teacher-education contexts or religious traditions; comparable work in a Christian religious-education setting, for instance, similarly reports that unfiltered digital engagement among Generation Z can produce doctrinal confusion alongside a preference for participatory online faith experiences (Pasuang & Saogo, 2023), suggesting the exposure-versus-verification tension examined here may not be specific to Islamic education, though this remains to be tested directly. Future research could pursue a more ambitious agenda building directly on the layered framework proposed here: investigating whether the orientation-reasoning discrepancy persists when participants evaluate authentic digital religious content under real-time or task-based conditions rather than a single hypothetical scenario (extending the approach of Kulju et al., 2024); using experimental designs to examine how generative-AI-assisted information seeking causally influences religious-information verification practices, given that the present AI-use finding is only correlational; employing independent double-coding of qualitative data; and conducting cross-cultural or cross-institutional comparisons, across religious traditions and educational systems, to test whether the layered structure of religious knowledge evaluation identified here extends beyond this Indonesian Islamic teacher-education context.

4. Conclusion

This study examined how Generation Z pre-service elementary teachers, aged 19-22, at a single teacher-education program access, evaluate, and reason about religious

information encountered in digital environments, distinguishing three tentative levels of the phenomenon: exposure, self-reported evaluation orientation, and articulated reasoning.

Empirically, the study found that exposure to digital religious content is frequent and widespread in this sample, occurring mainly through TikTok, Instagram, and YouTube; that self-reported evaluation orientation is moderately high but statistically uneven, with epistemic openness rated significantly higher than epistemic verification; that articulated reasoning about a concrete scenario of divergent religious content relies most heavily on cross-source verification and social-authority consultation, with only a small minority showing no verification step at all; and that generative-AI use, present for roughly one in five respondents, is associated with lower self-reported scores on two specific indicators, attention to source identity and cross-source comparison, though not on the overall composite orientation score.

Conceptually, these findings suggest digital religious literacy is better understood as multidimensional than as a single competence inferred from access, general self-report, or a single indicator alone. We propose, as an exploratory conceptual framework grounded in, but not yet established beyond, this single-institution dataset, that religious knowledge evaluation may be more usefully understood as a layered process than as a unitary competence: a three-layer framework of exposure, credibility/evaluation orientation, and epistemic verification (Figure 2), capturing three analytical dimensions that may align or diverge rather than a tested causal or structural sequence. In this sample, exposure did not correspond to a uniformly strong evaluation orientation, and a favorable evaluation orientation did not correspond to equally strong epistemic verification when respondents reasoned through a concrete case. We offer this layered view as the study's central conceptual proposal for future testing on larger and more representative samples, a way of asking, for work on digital religious-information evaluation generally, not only whether a given group scores well on some indicator, but at which layer alignment breaks down. Digital religious literacy, in this framing, is an interpretive, educational construct built on these empirical patterns rather than a directly measured variable, and we make no claim about whether this cohort "has" or "lacks" religious literacy as such.

Educationally, these provisional findings support treating digital religious-information evaluation as an explicit part of pre-service teachers' professional preparation, one that distinguishes legitimate authority-based verification from popularity-based heuristics, and that moves students from stating an intention to understand disagreement toward practicing active, doctrinally grounded verification. This study was limited to a single teacher-education program, relied on self-report and single-coder qualitative analysis, and treated its bivariate associations as exploratory; future work involving multiple institutions, behavioral or task-based evaluation measures, independent double-coding, and intervention designs would help verify and extend these tentative conclusions.

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