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# Education of fintech adoption: financial and digital education shaping technology uptake

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**Abstract**:
**Introduction**: This narrative review examines how financial literacy, digital financial literacy, and financial self-efficacy relate to fintech adoption and downstream outcomes. It distinguishes individual and firm adoption from ecosystem-level measures.
**Research method**: The review reports searches of OpenAlex and Crossref for 2020–2025 publications and a narrative screening and synthesis. The manuscript's bibliography contains 18 entries: 17 topic-related sources and one methodological source. Two 2026 citations are identified as supplementary, post-window sources. However, the submitted version does not identify, study by study, which articles were read in full text and which were assessed from abstracts. This revision independently checked available abstracts; it did not independently verify full-text readings.
**Result**: Available abstracts provide mixed, context-specific evidence. Some surveys report positive associations between literacy and fintech adoption, while the West Kalimantan study reports a positive but statistically nonsignificant literacy effect on adoption intention. Other studies examine financial inclusion, firm performance, or information-seeking rather than individual adoption. Claims from three cited studies could not be checked against an abstract in the selected academic records and are not treated as established findings here.
**Conclusion**: The evidence supports an association in some settings, not a causal conclusion that education produces fintech adoption. The revised synthesis separates direct adoption evidence, adjacent outcomes, contextual sources, and items requiring full-text verification.

**Keywords**: Digital financial literacy; Financial literacy; Financial self-efficacy; Fintech adoption; Narrative review.

## Introduction

Fintech adoption is often described as a matter of access: once a payment app, digital lender, or e-wallet is available, uptake is expected to follow. The studies reviewed here instead suggest that financial and digital capabilities can be relevant to adoption, although the strength and statistical significance of the relationship vary across settings. For example, a Bangladesh survey reports positive associations for financial literacy, digital literacy, and financial self-efficacy, whereas a West Kalimantan study reports a positive but nonsignificant literacy effect on adoption intention (Islam & Khan, 2024; Ayub & Wendy, 2025). These findings are observational and do not establish that education or training causes adoption.

This review defines fintech education as the set of financial knowledge, digital financial literacy, and financial self-efficacy that individuals and small-firm owners use to evaluate and operate financial

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technology. It covers financial literacy, digital or digital-financial literacy, and self-efficacy constructs, and treats formal training programs, self-directed learning, and experience-based learning as education channels. Adoption is defined as the uptake and sustained use of fintech services by individuals, households, or micro, small, and medium enterprises (MSMEs).

The gap this review addresses is threefold. First, a recent systematic literature review focuses on Islamic fintech and financial literacy rather than the general education–adoption relationship (Aksan et al., 2026). Second, the submitted manuscript cites work on possible reverse-direction effects, but the abstract for Ferilli et al. (2024) was not available in the academic records checked for this revision; that claim therefore remains unverified here and is not treated as an established finding. Third, adoption studies need to be distinguished from country-level fintech development evidence, which measures ecosystem conditions rather than individual or firm adoption (Ozili, 2023).

The contribution of this narrative review is conceptual rather than econometric. It organizes the literature into a synthesis matrix and an education-adoption framework that distinguishes the role education plays (antecedent, mediator, moderator, or outcome), the population studied, the design used, and the strength of evidence. This framing answers a question earlier reviews left open: education is not one variable but a family of constructs acting at different points in the adoption process, and pooled readings of the literature obscure that structure.

## Literature Review

Financial literacy and adoption-related outcomes. Findings are not uniformly positive or directly comparable. In Bangladesh, a cross-sectional survey of 450 respondents reports statistically significant positive effects of financial literacy, digital literacy, and financial self-efficacy on fintech adoption; the three variables explain 48.2% of the variance, and self-efficacy has the largest reported coefficient ($\beta$ = 0.574) (Islam & Khan, 2024). Among 152 UNIMAS students, financial knowledge and digital literacy are reported as significant predictors, alongside perceived usefulness (Rosman et al., 2025). In West Kalimantan, a survey of 233 Generation Z and Millennial respondents reports a positive but nonsignificant literacy effect on behavioral intention; the abstract also describes a positive correlation, so the result should not be summarized as an unequivocal significant effect (Ayub & Wendy, 2025). The Kupang study surveyed 218 students but examined financial management behavior as its outcome, not fintech adoption as the outcome (Muni et al., 2026). A conference paper based on 229 graduate and postgraduate students reports a positive literacy–fintech adoption path but provides no coefficient in its abstract (Priya & Rao, 2024). Aftab et al. (2025) report that several behavioral biases are associated with lower fintech adoption and that financial literacy positively conditions the relationship; the available abstract does not report the sample size or location. These studies are survey-based and do not establish that education causes adoption. Digital financial literacy and inclusion. The abstract for the rural Vietnam study describes its focus on digital financial literacy and fintech use but does not report sample details or a specific estimated result; a positive effect cannot be confirmed from the abstract alone (Hung & Khoi, 2025). The SME study is based in Zimbabwe—not South Africa—and reports a cross-sectional online survey of 221 SME owners and managers analyzed with probit regression. Its abstract reports positive relationships for numerical and digital financial literacy, with digital literacy the stronger predictor (Munongo & Pooe, 2025). Evidence on financial inclusion is adjacent to, rather than identical with, adoption: an Indian survey of 608 fintech users reports digital financial literacy as a mediator between fintech use and inclusion, and perceived regulatory support as a moderator of the fintech–inclusion relationship (Amnas et al., 2024). Khatri et al. (2025) report a survey of 153 respondents and positive direct and indirect relationships between fintech and inclusion through digital literacy; the country is not identifiable from the abstract checked here. Neither inclusion study establishes that education causes initial adoption.

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Education and performance pathways. The submitted version attributes a mediation finding to Hasan et al. (2024) and a sustainability-performance pathway to Siddik et al. (2023). No abstract or full text for either source was available in the selected academic records checked for this revision. Their sample, design, variables, estimates, and conclusions therefore remain unverified; neither claim is used as confirmed evidence in the synthesis. By contrast, the abstract for Haryadi et al. (2025) reports a questionnaire survey with 200 valid responses from Indonesia and Malaysia. It states that fintech adoption moderated the effects of financial inclusion and financial literacy on MSME financial performance, but not the behavior–performance link. This is a performance outcome, not direct evidence that education causes adoption.

Bidirectionality and the macro level. The submitted version says that fintech innovation improves customers' digital financial literacy, citing Ferilli et al. (2024), but the abstract was not available in the academic records checked for this revision. The claim remains unverified and is not treated as evidence here. At the country level, Ozili (2023) reports that financial inclusion and financial development are significant determinants of fintech and bigtech lending, based on data for 18 countries from 2013–2019. Ozili et al. (2024) analyze global internet-search interest during the pandemic and report a positive relationship and unidirectional causality between interest in fintech information and interest in financial-inclusion information. These sources measure lending or information seeking, not individual adoption. The available evidence therefore does not establish a consistent positive education–adoption relationship across populations.

## Research Methods

This manuscript uses a narrative review (Byrne, 2016) with a structured, traceable procedure; it is not a registered systematic review and estimates no pooled effect. The unit of synthesis is the study-level finding, reported in each study's own framing with causal language calibrated to its design.

Search strategy. Two databases were searched: OpenAlex and Crossref. The search period was January 2020 to December 2025. Search strings combined the concepts (fintech adoption) AND (financial literacy OR digital financial literacy OR financial education OR financial self-efficacy), with additional passes adding (SME OR MSME) and (financial inclusion). The final searches were run in 2026 against the 2020-2025 publication window.

Selection criteria. Studies were included if they (1) examined fintech adoption or fintech use as a dependent or independent variable, (2) measured at least one education construct (financial literacy, digital financial literacy, financial education, or financial self-efficacy), and (3) were published in English in an academic journal or peer-reviewed conference proceeding. Editorials, dissertations, preprints without peer review, and studies of fintech-vendor performance were excluded. Screening proceeded through title and abstract review, followed by full-text retrieval for studies retained as core evidence, as reported in the submitted manuscript. However, no article-level retrieval or reading log is supplied, so the full-text status of individual sources cannot be confirmed in this revision.

Verification basis and source accounting. The submitted manuscript states that core studies were read in full text and peripheral sources at abstract level, but it does not identify the reading status of each cited article or provide a study-level retrieval/extraction log. This revision therefore cannot confirm which studies were read in full text by the authors. The academic records available for this revision supplied abstracts for most, but not all, cited studies; no full texts were independently retrieved. Table 1 marks this distinction source by source. The reference list contains 18 entries, not 17: 17 topic-related sources (16 empirical studies and one review) and one methodological source (Byrne, 2016). Each entry is cited, but their evidentiary roles differ: direct adoption studies form the core; inclusion, performance, macro-level, and review sources are adjacent or contextual. In addition, the stated publication window ends in 2025, whereas Muni et al. (2026) and Aksan et al. (2026) are cited; these two sources are therefore treated as supplementary, post-window citations, not as eligible records from the reported search. Three empirical sources (Hasan et al., 2024; Siddik et al., 2023; Ferilli et al., 2024) could not be checked against an abstract in the selected records and are not treated as verified findings in this revision.

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Evidence appraisal. This revision does not assign numerical or ordinal evidence-strength ratings because the available abstracts do not provide consistent information on measurement validation, model specification, or risk of bias. Instead, the synthesis identifies the reported design and sample when available, separates direct adoption outcomes from adjacent outcomes, and uses associational language for observational surveys. Full appraisal of sampling, instruments, statistical models, and causal identification requires the article full texts and a study-level extraction record; these are not available for independent checking here.

## Results

### Synthesis matrix

Table 1 summarizes the 17 topic-related sources cited in the review and distinguishes direct adoption findings from adjacent financial-inclusion, performance, macro-level, and review evidence. Muni et al. (2026) and Aksan et al. (2026) fall outside the stated 2020–2025 search window and are marked as supplementary. In the final column, NR means the submitted manuscript does not report the authors' full-text status for that article; A means an abstract was checked for this revision, and U means no abstract was available in the selected academic records. No full texts were independently retrieved. Byrne (2016) is the separate methodological source and is not an empirical study.

Table 1. Summary of Empirical and Contextual Sources

| Study / context | Design and sample | Education construct / role | Finding and source check |
|---|---|---|---|
| Islam & Khan (2024) Bangladesh | Cross-sectional survey; n=450 | Financial literacy; digital literacy; self-efficacy | Positive significant associations; $R^2$=.482; self-efficacy β=.574 strongest. |
| Rosman et al. (2025) UNIMAS students, Malaysia | Questionnaire; n=152; regression | Financial knowledge; digital literacy | Knowledge, digital literacy, and perceived usefulness significant. |
| Ayub & Wendy (2025) West Kalimantan, Indonesia | Survey; n=233; PLS-SEM | Financial literacy | Positive but nonsignificant literacy effect on adoption intention. |
| Muni et al. (2026) Kupang, Indonesia | Survey; n=218; PLS-SEM | Literacy, fintech adoption, self-efficacy | Financial-management outcome. |
| Priya & Rao (2024) Graduate students; India | Survey; n=229 | Financial literacy | Positive literacy-to-adoption. |
| Aftab et al. (2025) Banking-sector customers | Questionnaire | Financial literacy; behavioral biases | Literacy conditions bias–adoption relationship; details limited. |
| Munongo & Pooe (2025) Zimbabwe; SMEs | Cross-sectional online survey; n=221; probit | Numerical and digital financial literacy | Positive literacy–adoption association; digital literacy stronger predictor. |
| Amnas et al. (2024) India; fintech users | PLS-SEM survey; n=608 | Digital literacy; regulatory support | Literacy mediates fintech-use–inclusion; regulatory support moderates fintech–inclusion. |
| Khatri et al. (2025) Country unclear in abstract | Questionnaire; n=153; SEM | Digital financial literacy | Positive direct/indirect fintech–inclusion links via literacy. |
| Haryadi et al. (2025) Indonesia and Malaysia; MSMEs | Survey; 200 valid responses; PLS-SEM | Fintech adoption as moderator | Adoption moderates inclusion/literacy–performance. |
| Ferilli et al. (2024) Europe | Survey | Digital financial literacy | Reverse-direction fintech-to-literacy. |
| Ozili (2023) 18 countries; 2013–2019 | Country panel; difference-GMM and 2SLS | Macro-level inclusion/development | Inclusion and development determine fintech/bigtech lending. |

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| Study / context | Design and sample | Education construct / role | Finding and source check |
|---|---|---|---|
| Ozili et al. (2024) Global; pandemic period | Internet search-interest analysis | Information seeking, not education | Search interest in fintech and financial-inclusion info related. |
| Aksan et al. (2026) Islamic fintech literature | Systematic review; 27 publications, 2018–2024 | Financial literacy; contextual review | Supplementary 2026 review; contextual. |

**Education as antecedent of adoption**

Direct adoption findings are mixed rather than uniformly positive. Islam and Khan (2024) report positive statistically significant associations in a cross-sectional sample of 450, with $R^2 = 0.482$ and financial self-efficacy as the strongest reported predictor ($\beta = 0.574$). Rosman et al. (2025) report significant roles for financial knowledge and digital literacy among 152 students. Ayub and Wendy (2025), by contrast, report a positive but nonsignificant literacy effect on behavioral intention among 233 respondents. Munongo and Pooe (2025) report a positive association among 221 Zimbabwean SME owners and managers. Other included abstracts report either a literacy-to-adoption path without an effect estimate (Priya & Rao, 2024) or study aims without a specific result (Hung & Khoi, 2025). Muni et al. (2026) study financial management behavior, not adoption as the outcome. These are not seven interchangeable estimates: populations, constructs, and outcomes differ, and the evidence is observational. It supports context-dependent associations, not a causal effect of education or training.

**Education as mediator and moderator**

Available abstracts describe mediation between fintech use and financial inclusion through digital financial literacy in the Amnas et al. (2024) and Khatri et al. (2025) surveys. These models concern inclusion pathways, not education as a cause of initial adoption. Haryadi et al. (2025) report a different result: adoption moderates the effects of financial inclusion and literacy on MSME performance in a 200-response Indonesia–Malaysia survey. The manuscript's claims about Hasan et al. (2024) and Siddik et al. (2023) cannot be confirmed from the selected records and are not used to support this interpretation. Because the available mediation/moderation evidence is cross-sectional survey evidence, temporal ordering and causal mechanism are not established.

**Education as outcome and the bidirectional loop**

A proposed reverse-direction finding is attributed to Ferilli et al. (2024), but no abstract or full text was available in the selected records checked for this revision. It cannot be used here as verified evidence that fintech improves literacy. Accordingly, the feedback loop between education and adoption remains a research hypothesis, not a conclusion supported by the sources independently checked for this revision.

**Construct boundaries: adoption, exposure, and infrastructure**

The synthesis distinguishes direct adoption outcomes from adjacent constructs. Direct evidence includes user- or firm-level measures of fintech adoption or intention. Financial-inclusion and MSME-performance outcomes are downstream or related outcomes, not direct evidence of adoption. Ozili (2023) analyzes country-level fintech/bigtech lending, while Ozili et al. (2024) analyze internet-search interest; neither measures an individual's adoption decision or financial education. Aksan et al. (2026) is a contextual review, and Byrne (2016) is a methodological source. These sources inform context or method but do not count as direct tests of the education–adoption relationship.

**Evidence quality by design**

The abstracts independently checked for this revision describe mostly cross-sectional surveys. The three cited sources for which no abstract was available (Hasan et al., 2024; Siddik et al., 2023; Ferilli et al., 2024) cannot be classified or used to rank evidence quality without full-text checking. Ozili (2023) reports country-panel analyses, but it includes no education construct and cannot strengthen the education–adoption

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inference. No randomized education intervention is identified in the verified abstract set. The defensible conclusion is therefore limited: the available observational evidence includes some positive associations, but it does not establish a causal effect of education on fintech adoption.

**Research agenda**

Three priorities follow. First, evaluate financial-education programs experimentally or quasi-experimentally with registered fintech-adoption outcomes. Second, collect longitudinal measures of education and adoption to test temporal ordering in mediation. Third, harmonize digital-financial-literacy measures and report whether competence arose through formal training, self-learning, or experience.

## Conclusion

This review examines 17 topic-related sources and one methodological reference, but the submitted manuscript does not document full-text status source by source. Available abstracts support mixed, context-specific associations—not a general positive or causal education–adoption effect. The synthesis separates direct adoption studies from inclusion, performance, macro-level, and contextual sources and flags two 2026 citations as supplementary, outside the reported 2020–2025 search window. Three empirical findings remain unverified because no abstract was available. Full-text logging and verification of those papers are needed before stronger conclusions can be made.

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