

BUILDING FINANCIALLY RESPONSIBLE ADOLESCENTS THROUGH GAMIFICATION-BASED EDUCATION: A CONCEPTUAL FRAMEWORK FOR DIGITAL DEBT PREVENTION

Ida Ayu Dipavali Pradnyani¹

Udayana University

¹ Department of Management, Faculty of Economic and Business, Udayana
University, Bali, Indonesia

Corresponding author: dipaprdyn31@email.com

Abstract

The development of digital financial services has increased adolescents' access to various financial technology products, such as installment payments and online loans. However, this increased access is not always accompanied by adequate financial literacy, which can make them more vulnerable to consumer behavior and the risk of digital debt. This study aims to examine the role of financial education through gamification in improving adolescents' financial knowledge and to propose a conceptual framework for preventing the risk of digital debt. A systematic literature review (SLR) was conducted, analyzing 26 articles on financial literacy, digital financial risks, and the application of gamification in financial education. The results indicate that financial literacy plays a protective role by promoting responsible financial behavior. However, acquiring knowledge alone is insufficient without strengthening self-control and providing concrete learning experiences. Furthermore, gamification approaches, through simulations, challenges, rewards, and interactive learning, have the potential to increase adolescents' engagement and financial understanding. Based on a literature review, this study proposes the CuanEra conceptual framework, which integrates financial education through gamification, digital financial risk awareness, and community support as an alternative and more suitable strategy for financial education for adolescents in the digital age.

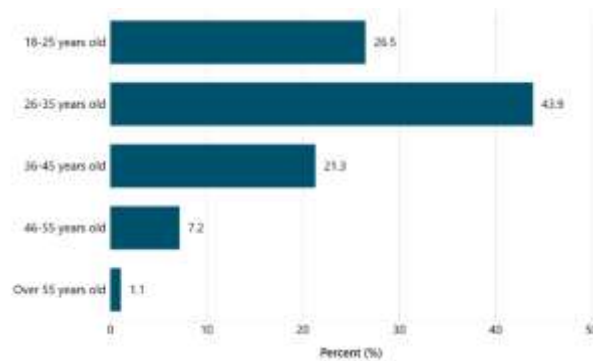
Keywords: Financial education; Gamification; Young generation; Digital financial literacy; CuanEra

INTRODUCTION

The development of digital technology has brought significant changes to the way people access and use financial services. One form of innovation that has grown rapidly is financial technology (fintech), which offers a wide range of digitally based financial services with processes that are faster and easier than those of conventional services. One service that has experienced increased usage is Buy Now Pay Later (BNPL), a payment facility that allows users to obtain goods or services first and make payments in installments at a later date (Kholifah et al., 2026). The ease of registration, payment flexibility, and integration with various digital platforms have made PayLater services increasingly popular, especially

among young people who have a high level of interaction with digital technology (Yuliana, 2024).

Figure 1. **Number of Paylater Users in Indonesia by Age Group (2023)**



Source : databoks.katadata.co.id

Based on data from Databoks Katadata (Muhamad, 2024), Generation Z and millennials are among the main user groups of PayLater services in Indonesia, accounting for 43.9% in 2023. This condition shows that young people are an important part of the development of the digital financial ecosystem. However, increased access to digital financial services does not always go hand in hand with individuals' readiness to understand the risks and consequences of using them. Ease of access to digital credit can provide benefits in expanding financial inclusion, but it can also give rise to financial problems if it is not accompanied by adequate financial management skills (Novitasari, 2026).

These problems have become increasingly visible in the use of online lending services among young people. According to a survey by Tempo.co (2024), approximately 34% of Generation Z in Indonesia reported having used online lending services. This high level of usage shows that young people are becoming a group that is increasingly close to digital credit services, yet not all of them have an adequate understanding of the risks of using these services. Data from the Financial Services Authority (OJK, 2024) also show that young age groups contribute to the problem of non-performing loans in digital lending services. This condition shows that low digital financial literacy can increase users' vulnerability to the unwise use of digital lending services, particularly with regard to illegal lenders that exploit users' limited understanding.

In addition to financial knowledge, the digital environment also influences how adolescents make consumption decisions. The intensity of social media use increases exposure to advertisements, lifestyle trends, digital marketing strategies, and various forms of promotion such as discounts and cashback that can encourage consumptive behavior (Rahmawati & Sari, 2022). During the developmental phase of childhood and adolescence, the ability to control

impulses and evaluate risks is still developing, so financial decisions are sometimes more strongly influenced by emotional impulses and social environmental influences (Fitriani et al., 2021). The phenomenon of Fear of Missing Out (FOMO), peer pressure, and the desire to follow digital trends can also reinforce the tendency toward impulsive buying among young people (Haqi & Trisnaningsih, 2025).

These conditions show the importance of strengthening financial literacy from an early age. Financial literacy is related not only to an understanding of basic concepts about money, but also includes the ability to prepare a budget, determine priorities among needs, control spending, understand risks, and make financial decisions rationally (Wahyuni & Reswita, 2020). As the use of digital financial services increases, this concept has developed into digital financial literacy, namely an individual's ability to understand digital financial products, evaluate financial information, maintain the security of personal data, and use digital services responsibly (Rahayu et al., 2022). However, various studies show that financial education for young people still faces challenges because conventional methods such as lectures and one-way delivery of material have not been fully able to increase the engagement of a generation that grows up in a digital environment (Mallia et al., 2020).

One approach that can be developed to address these challenges is the use of gamification in financial education. Gamification integrates game elements such as challenges, simulations, rewards, feedback, and competition to create a more interactive learning experience (Schöbel et al., 2020). A study by Marchetti et al. (2021) affirms that introducing financial concepts in a structured and engaging manner is crucial in building the foundation of children's literacy. This approach allows adolescents not only to understand theory, but also to actively train their financial decision-making skills through realistic simulation experiences. The use of gamification elements also shows potential in increasing participants' motivation, engagement, and understanding in the learning process.

Although studies on financial literacy, consumptive behavior, and the use of digital financial services have developed, research that specifically integrates a gamification approach as a financial education strategy to help adolescents face digital debt risk remains relatively limited. Therefore, this article aims to review the literature on gamification-based financial education and to propose a conceptual framework as an innovative approach to improving adolescent financial literacy and reducing digital debt risk in the era of digital financial transformation.

RESEARCH METHOD

This study uses the Systematic Literature Review (SLR) method to answer the research questions formulated in the introduction section. In the process, the author applied the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to identify and analyze the strengths and weaknesses of applying gamification in the context of financial literacy education. The use of the PRISMA approach aims to ensure quality and rigor at every stage of the literature review, while also providing a systematic, transparent, and replicable procedure for the identification, screening, and analysis of relevant studies (Khaldi et al., 2023).

Data Collection Technique

The data in this study were collected from reputable academic databases, including Scopus, ScienceDirect, Springer, Google Scholar, and PubMed for articles related to the education and developmental psychology of adolescents. The literature search was conducted using the keyword combination “Gamification” OR “Financial Literacy” OR “Digital Debt” to identify scientific articles and publications relevant to the research topic. The use of these keywords aims to obtain literature that specifically discusses gamification, both in the context of financial literacy and digital debt risk, so that the scope of the search remains focused on the research focus.

Data Analysis Method

This study applies the PRISMA standard in conducting the systematic literature review. The initial stage of the literature search was carried out using the keyword combination mentioned in the previous section. All search results were then downloaded in CSV format and subjected to a screening process in order to eliminate duplicate documents and literature that was not relevant to the research topic.

To determine the eligibility of the articles used in the study, several inclusion and exclusion criteria were established as follows:

Inclusion Criteria	Exclusion Criteria
Scientific articles that have undergone a peer review process and discuss gamification in the context of financial literacy.	Publications that are not scientific articles, such as conference abstracts and book chapters without empirical data.
Studies that discuss the application and benefits of gamification in the field of financial literacy or the prevention of digital debt risk.	Articles that do not specifically discuss gamification in the field of financial literacy.

Articles published in the period 2017 to 2026, in line with the development of the research topic.	Duplicate documents or articles that cannot be accessed in full (full text).
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After the inclusion and exclusion criteria were established, the selection process was carried out manually. In the first step, the author identified and eliminated duplicate articles or data using the conditional formatting and filtering features of Microsoft Excel. Subsequently, articles that lacked relevance to the topic and the purpose of the study were removed. The next step involved reading the full content of the articles that had passed the first screening phase in order to compare them with the established eligibility criteria. Based on this assessment, articles that met the criteria were included as sources of the study, while articles that did not meet the criteria were excluded from the study process. Through the identification, screening, and eligibility assessment described above, 26 articles that met the requirements for a more thorough analysis were obtained, as shown in Table 1.

The data analysis was then carried out using a Thematic Analysis approach to identify the main patterns and themes from the 26 articles that had been collected. The thematic coding process was carried out by grouping the findings into four main themes, namely: (1) financial literacy problems; (2) digital debt risks; (3) gamification effectiveness; and (4) proposed educational framework. These four themes were then used as the structure of the analysis in the results and discussion section to answer the research objectives.

RESULTS AND DISCUSSION

Table 1. Literature Review

No.	Author & Year	Title	Method	Key Findings
1	Restike et al. (2024)	The Influence of Financial Literacy, Impulsive Buying Behavior, and Lifestyle on Shopee PayLater Use Among Generation Z	Quantitative, PLS-SEM, 200 respondents	The findings show that strong financial literacy and self-control play a key role in curbing impulsive buying behavior. However, a trend-driven lifestyle was found to increase the use of PayLater features among Generation Z.
2	Kholifah et al. (2026)	Analyzing the Effect of Buy Now Pay Later on Student Financial Management in the 2026 Digital Era	Quantitative, simple linear regression, 120 respondents	This study found that easy access to Buy Now Pay Later significantly lowers the quality of students' financial management. In contrast, stronger financial literacy was directly

				associated with a reduced risk of bill accumulation.
3	Fatkhuri et al. (2025)	Building Adolescents' Awareness of Illegal Online Lending Risks through Interactive Digital Quizzes	Participatory educational qualitative study, interactive digital quiz, 33 participants	The results show that an interactive digital quiz approach significantly raised adolescents' understanding to above 90%. This finding confirms that interactive simulation is more effective than conventional lectures in helping adolescents recognize illegal online lending schemes.
4	Sutisna et al. (2025)	Adolescents' Level of Understanding of Online Lending and Online Gambling	Mixed methods (descriptive quantitative and qualitative), 46 students	This study found that adolescents possess a fairly adequate understanding of the risks posed by online lending. However, limited self-control still leaves some of them vulnerable to risky decisions when exposed to aggressive social media promotions.
5	Azzahra & Hardini (2026)	Exploring How Financial Literacy and Peer Influence Impact Financial Behavior: Understanding the Role of Locus of Control in Higher Education	Quantitative, path analysis (regression) with Sobel test, 177 respondents	The findings show that internal locus of control mediates and strengthens the positive effect of financial literacy on financial behavior. In contrast, peer pressure tends to weaken financial management discipline when not reinforced by internal control.
6	Effendi et al. (2026)	A Decade of Financial Literacy Research in Indonesia: A Bibliometric Review (2014-2024)	Bibliometric and systematic review, 1,000 articles	This study found that financial literacy research trends in Indonesia over the past decade remain dominated by quantitative approaches focused on university students. However, studies specifically evaluating digital education interventions for secondary-school-aged adolescents remain relatively limited.
7	Elfita et al. (2026)	Enhancing Adolescents' Accounting and Financial Literacy: Preparing a	Community service program, pre-test and post-test case simulation	The results show that interactive simulation-based financial literacy training raised critical awareness among

		Financially Savvy Generation in the Digital Era		adolescent participants to 100%. In contrast, education delivered without simulation-based practice proved less effective in changing daily spending habits.
8	Tamara & Agustina (2024)	Financial Management Behavior on Buy Now Pay Later Users: Does Education Level Mediate the Effect?	Quantitative, PLS-SEM, 150 respondents	This study found that financial literacy and self-control have a significant positive effect on the financial management behavior of PayLater users. However, formal education level did not show a significant mediating role in this relationship.
9	Popovich et al. (2020)	Community College Students' Response to a Financial Literacy Intervention: An Exploratory Study	Exploratory quantitative, pre-test and post-test survey	The findings show that a case-based financial education module significantly improved students' basic accounting understanding. In contrast, students who did not receive the intervention tended to maintain unplanned spending patterns.
10	Schöbel et al. (2020)	Capturing the Complexity of Gamification Elements: A Holistic Approach for Analysing Existing and Deriving Novel Gamification Designs	Design science research (DSR), taxonomy development and case study	This study found that the structured integration of gamification elements can enhance intrinsic motivation and active user participation. However, overly complex game elements without clear educational goals risk reducing learning retention.
11	Johnson et al. (2021)	Impact of the FutureSmart Online Financial Education Course on Financial Knowledge of Middle School Students	Quasi-experimental, pre-test and post-test control group, 524 students	The findings show that the interactive web-based FutureSmart financial literacy course significantly increased students' financial knowledge by 21.8 percentage points. This finding confirms that interactive digital media is effective in building financial self-efficacy from an early age.
12	Thorp et al. (2023)	Feeling Comfortable with a Mortgage: The Impact of	Quantitative experimental, instrumental variable	This study found that individuals with stronger financial literacy tend to

		Framing, Financial Literacy and Advice	GMM, 999 respondents	make more cautious decisions regarding long-term debt accumulation. However, individuals with lower financial understanding are more easily influenced by manipulative credit-promotion framing.
13	Kaiser & Menkhoff (2020)	Financial Education in Schools: A Meta-Analysis of Experimental Studies	Quantitative meta-analysis, 37 experimental studies (18 RCTs)	The meta-analysis results show that school-based financial education programs have a significant positive effect on students' knowledge. In addition, these interventions were also positively associated with real financial behavior change, albeit at a moderate scale.
14	Arofah et al. (2018)	Financial Literacy, Materialism and Financial Behavior	Explanatory quantitative, PLS-SEM, 129 respondents	The findings show that financial literacy has a positive effect on the formation of healthy financial behavior. However, a high degree of materialism was found to have a negative effect, driving an increase in unplanned consumptive spending.
15	Sutter et al. (2019)	Economic Behavior of Children and Adolescents: A First Survey of Experimental Economics Results	Systematic literature survey, developmental experimental economics	This study found that increasing age and cognitive maturity among adolescents are consistently associated with greater patience and more rational decision-making. In contrast, a lower socio-economic background tends to increase daily financial risk preference.
16	Hati & Wibowo (2017)	Exploring the Motivation Toward and Perceived Usefulness of a Financial Education Program Offered to Low-Income Women in Indonesia	Mixed methods (mini survey and in-depth interviews), 23 participants	The findings show that participants' intrinsic motivation is the main factor determining the success of financial literacy knowledge retention. However, training material perceived as irrelevant to real economic conditions tends to reduce the program's effectiveness.

17	Frisancho et al. (2021)	Can a Budget-Recording Tool Teach Financial Skills to Youth? Experimental Evidence from a Financial Diaries Study	Randomized controlled trial (RCT), mobile-based budget-recording application	This study found that the independent use of a daily budget-recording application successfully encouraged adolescents to actively manage their personal finances. In contrast, without a structured recording tool, adolescents tended to struggle to track the accumulation of their small expenses.
18	Muhammad et al. (2024)	Enhancing Digital and Financial Literacy Among Students of SMP Negeri 01 Tanjungsang Toward a Technology- and Financially-Literate Generation	Community service program, interactive training and workshop	The findings show that the simultaneous integration of digital and financial literacy material successfully improved students' understanding of risky transactions. However, limited access to digital devices remains an obstacle to sustaining these habits.
19	Gunibala (2025)	Scoping Review: The Effectiveness of Fintech Adoption on the Performance of Indonesian MSMEs	Scoping review, systematic literature review	This study found that the use of financial technology has a positive effect on the efficiency of daily transactions. In contrast, limited financial literacy and digital risk management could potentially trigger long-term cash management failures.
20	Amran et al. (2026)	Grocery Grab: Virtual Reality Application for Financial Literacy Education Among Young Learners	Quantitative, experimental, user engagement testing with the <i>User Engagement Scale Short Form</i> (UES-SF) and Cronbach's alpha reliability among young learners.	The results show that the use of the <i>Virtual Reality</i> application "Grocery Grab" was able to increase learners' engagement and intrinsic motivation in learning financial literacy. This indicates that interactive experience-based learning can help children understand shopping decision-making processes and everyday financial management more concretely.

21	Detthamrong & Chansanam (2026)	Extended UTAUT2 Framework for FinTech Continued Use among Thai Older Adults	Quantitative, cross-sectional survey, Covariance-Based SEM (CB-SEM) and Partial Least Squares SEM (PLS-SEM) analysis, sample of 430 elderly respondents in Thailand.	This study found that <i>personal trust</i> , <i>technology anxiety</i> , and <i>digital literacy</i> are important factors influencing the intention to continue using as well as the actual use of FinTech services. These findings show that the sustainability of financial technology use is influenced not only by the benefits of the technology, but also by the level of trust, digital ability, and user comfort when interacting with technology.
22	Lai & Langley (2024)	Playful finance: Gamification and intermediation in FinTech economies	Qualitative, conceptual analysis of the political economy of platforms and <i>interface analysis</i> on FinTech platforms.	This study shows that gamification elements are used in FinTech platforms to attract the attention of young users through game-like experiences. However, increasingly <i>playful</i> designs not only increase user engagement, but can also shape new financial behavior patterns that have the potential to encourage higher-risk investment decision-making.
23	Misara et al. (2026)	Gamified Finance: A Systematic Literature Review using TCCM Framework	<i>Systematic Literature Review</i> (SLR) with the SPAR-4-SLR protocol and the TCCM framework, reviewing 81 journal articles indexed in Scopus/WoS.	The results show that the application of gamification in financial apps can increase users' sense of autonomy, competence, engagement, and retention. However, these findings also show that the use of gamification needs to consider ethical aspects because it has the potential to encourage impulsive behavior. This indicates that the effectiveness of gamification needs to be viewed not only from short-term engagement, but also from its influence

				on sustainable financial behavior.
24	Sconti et al. (2024)	Gen Z and financial education: Evidence from a randomized control trial in the South of Italy	Quantitative, <i>Randomized Control Trial</i> (RCT) and <i>Difference-in-Differences</i> (DiD), incentivized intertemporal <i>Convex Time Budget</i> (CTB) tasks among Gen Z students aged 12 to 13 years.	Based on the results of the study, financial education from a young age can help students consider long-term benefits, including in saving decisions, while also reducing the tendency to make decisions that are overly oriented toward short-term gratification.
25	Vaswani & Sirohi (2026)	Social Media Influence and Overconfidence Bias in Financial Knowledge: A Generational Comparison of Gen Z and Millennials in Indian Tier-II Cities	Quantitative, Probit and Logit models with <i>Clustered Robust Standard Errors</i> , pan-India survey data (n = 5,587 young Gen Z and Millennial investors).	The use of social media as the main source of financial information is associated with increased <i>overconfidence bias</i> regarding financial knowledge. This tendency is stronger among Generation Z than among Millennials. This shows that the ease of obtaining financial information through social media is not necessarily followed by users' ability to assess the accuracy and quality of information objectively.
26	Xie et al. (2023)	Do young generations save for retirement? Ensuring financial security of Gen Z and Gen Y	Quantitative, survey microdata analysis, <i>Logit Model</i> and <i>Pairwise Comparison</i> (LS Means), sample of 701 respondents from various age groups in Poland.	In that study, saving behavior for retirement was influenced by age and the level of an individual's financial responsibility. However, Generations Z and Y are still more oriented toward short-term saving needs than toward retirement planning. Therefore, the low orientation toward long-term financial planning remains an important challenge for the younger generation.

Based on the results of the analysis of the 26 reviewed articles, it can be concluded that financial literacy, exposure to digital debt risk, and the effectiveness of gamification-based educational approaches are dominant themes that are interrelated in shaping adolescents' financial behavior in the digital era. Most studies

show that adequate financial literacy plays an important role in suppressing consumptive behavior and impulsive buying, as found by Restike et al. (2024) and Tamara and Agustina (2024). Conversely, ease of access to Buy Now Pay Later services and online loans has been shown to increase the risk of debt accumulation if it is not balanced with sufficient financial understanding (Kholifah et al., 2026; Fatkhuri et al., 2025). On the other hand, a number of studies have also proven that interactive educational approaches based on simulations and digital games are consistently more effective than conventional lecture methods in building awareness of financial risk among adolescents (Fatkhuri et al., 2025; Elfita et al., 2026; Johnson et al., 2021). Overall, the findings from these various articles confirm that improving financial literacy needs to be accompanied by more interactive and contextual innovation in educational methods so that it can shape healthy and sustainable financial behavior among adolescents.

Current Challenges of Adolescent Financial Literacy

The results of the literature review show that adolescents today still face a number of fundamental challenges in terms of financial literacy. First, budgeting skills among adolescents are still relatively low, as reflected in the findings of Kholifah et al. (2026), which show that the ease of access to Buy Now Pay Later actually reduces the quality of students' financial management due to weak expenditure planning ability. Second, saving habits among adolescents have not been formed consistently; Frisancho et al. (2021) found that without a structured recording tool, adolescents tend to have difficulty monitoring the accumulation of their small expenses, making it difficult to build sustainable saving habits. Third, adolescents' financial decision-making ability is still relatively weak, especially when they are faced with social pressure and aggressive promotions on social media (Sutisna et al., 2025; Azzahra & Hardini, 2026). Sutter et al. (2019) also added that the still-developing cognitive maturity of adolescents is one of the factors that makes them more vulnerable to financial risk preferences compared with adult age groups. This condition is reinforced by the findings of Effendi et al. (2026) through a bibliometric review, which show that financial literacy research in Indonesia is still dominated by university student populations, while digital education interventions for secondary-school-age adolescents remain relatively limited, thus confirming the need for greater attention to this age group.

The Relationship between Financial Literacy and Digital Debt Risk

The literature review indicates a tiered relationship between financial literacy, financial behavior, and digital debt risk, which can be described through the following flow: low financial literacy contributes to the formation of less prudent financial

behavior, which then increases digital debt risk. Tamara and Agustina (2024) found that financial literacy and self-control have a significant positive effect on the financial management behavior of PayLater users, even though the level of formal education did not show a significant mediating role in that relationship. In line with this, Thorp et al. (2023) revealed that individuals with better financial literacy tend to make more cautious decisions regarding long-term debt accumulation, while individuals with low financial understanding are more easily influenced by manipulative credit promotion framing. In the specific context of Indonesian adolescents, Fatkhuri et al. (2025) and Sutisna et al. (2025) showed that although adolescents have a fairly adequate understanding of the risks of online loans, limited self-control still makes some of them vulnerable to making risky decisions when exposed to aggressive promotions on social media. Thus, it can be concluded that financial literacy alone is not always sufficient to prevent digital debt risk if it is not accompanied by the strengthening of self-control and educational strategies that are able to translate knowledge into concrete preventive action.

The Role of Gamification in Financial Education

The various studies reviewed consistently show that a gamification approach has a positive impact on adolescents' motivation, engagement, and learning retention in financial education. Gamification can make financial education feel more engaging and closer to young users because the learning process is packaged like a game, although its use still needs to take into account the possible emergence of riskier financial decisions (Lai & Langley, 2024). Johnson et al. (2021), through a quasi-experimental study of 524 secondary school students, found that the interactive web-based FutureSmart financial literacy course was able to increase students' financial knowledge by 21.8 percentage points. This finding is reinforced by the results of the meta-analysis by Kaiser and Menkhoff (2020) of 37 experimental studies, which showed that school-based financial education programs have a significant impact on increasing students' knowledge (+0.25 SD) as well as on real financial behavior change on a moderate scale (+0.05 SD). In the Indonesian context, Fatkhuri et al. (2025) showed that an interactive digital quiz approach was able to increase adolescents' understanding of the risks of illegal online loans to above 90%, while Elfita et al. (2026) proved that training based on interactive case simulations was able to increase the critical awareness of adolescent participants to 100%. Popovich et al. (2020) also added that an education module based on real cases significantly increased students' basic accounting understanding compared with the group that did not receive the intervention.

Meanwhile, from the perspective of system design, Schöbel et al. (2020) emphasize that the integration of structured gamification elements, such as

challenges, reward systems, and simulations, is able to increase users' internal motivation and active participation in games, but the application of game elements that are too complex without clear educational objectives actually has the potential to reduce learning retention. Through a randomized controlled trial (RCT) approach, it was also shown that a mobile-based budget-recording application used independently was able to encourage adolescents to manage their personal finances more actively (Frisancho et al., 2021). Overall, these findings confirm that gamification is not merely additional entertainment in the learning process, but a pedagogical mechanism that is able to bridge the gap between financial knowledge and its application in real decision-making.

Proposed CuanEra Conceptual Framework

Based on the synthesis of the previous findings, this study proposes the *CuanEra* conceptual framework as a gamification-based financial education model aimed at helping prevent digital debt risk among adolescents. This framework is still conceptual in nature, or a *proposed model*, because it was developed based on the synthesis of various previous studies and its effectiveness has not yet been tested empirically.

The development of the *CuanEra* learning framework is also motivated by conditions found in the field. The urgency of developing this learning framework is also reinforced by the author's direct observations in the field, in which the author carried out a simple financial literacy outreach program in the Tabanan area, Bali.

CuanEra is designed as a series of educational activities that take place in stages and on a continuous basis. The process begins with the introduction of financial concepts at school as the main target for the younger generation. It is then continued with practice and habituation through the application, and reinforced through community-based mentoring. The components that make up the *CuanEra* framework, along with their respective functions, are presented in the following table.

Table 2. Components of the CuanEra Conceptual Framework

Component	Function
School Outreach Education	Introduces the difference between needs and wants and instills the habit of saving and sharing from an early age
Financial Simulation Game (CuanHero & PayDay)	Trains monthly budget management and decision-making amid the temptation of trends
Social Spend Tracker (AI)	Records expenses automatically and provides budgeting advice
Saving Streak & Reward	Builds saving habits together with peers and strengthens positive financial behavior
Anti-Pinjol & PayLater Module	Introduces the risk of digital debt and provides early warning

Community Mentoring	Maintains the sustainability of behavior through peer educators and consultation posts
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The six components in Table 2 are not run separately, but as a single series of educational activities that takes place in three stages as follows.

a. School Outreach Education

The first stage is carried out through interactive visits to schools in the Tabanan and Kerambitan areas by *CuanEra* volunteers, consisting of university students and financial practitioners. This activity is not designed as a one-way lecture, but as a discussion and practice session together with students. Volunteers guide students to distinguish *needs* from *wants* through examples close to their daily lives, such as choosing between buying a trending item or setting aside pocket money. Students are also encouraged to get used to dividing their money for saving and sharing from an early age. This simple habit becomes an initial provision for adolescents to resist the urge of FOMO and to be more cautious about offers of PayLater and illegal online loans. The presence of volunteers whose ages are relatively close to those of the students also provides a real example of healthy financial behavior, in line with the concept of learning through observation in *Social Cognitive Theory* (Bandura, 1986). At the end of the session, students are introduced to the *CuanEra* application as a means to continue the learning process independently.

b. Learning through the CuanEra Application

The second stage is the core of the habituation process. The *CuanEra* application is designed to be concise and interactive, with four main components as listed in Table 2.

First, the Financial Simulation Game, which consists of the games *CuanHero* and *PayDay*. In these games, players take on the role of managing monthly finances, making decisions amid various trend temptations, and allocating budgets for basic needs, savings, and sharing. The winner is determined by the highest net worth at the end of the game, so that players are encouraged to think long-term and not simply spend money. Through this simulation, adolescents can directly experience the consequences of each decision without bearing actual losses, in accordance with the experiential learning cycle explained by Kolb (1984).

Second, the *Social Spend Tracker*, which is an expense-recording feature based on artificial intelligence. This feature helps users record expenses automatically and provides *budgeting advice* according to each person's spending pattern. By seeing their own expense records, adolescents can more easily become aware of where their money is being used.

Third, *Saving Streak & Reward*, which is a saving challenge carried out together with peers. This feature periodically reminds users to complete saving challenges, and every challenge that is successfully completed is rewarded with points or badges.

The aim is to train discipline and reduce impulsive shopping habits. The elements of togetherness and achievement in this feature help fulfill the needs for competence and relatedness which, according to Ryan and Deci (2000), are important for sustaining motivation over the long term.

Fourth, the Anti-Pinjol (anti-illegal online loan) & PayLater Module, which functions as an early warning system. This module contains practical guides and interactive quizzes on the dangers of consumptive debt, including personal data fraud schemes such as the practice of “selling ID cards” (“jual KTP”) that often targets young people. If a user is recorded as frequently making PayLater transactions in an uncontrolled manner, the application will automatically display short educational material as a reminder. In this way, education is delivered precisely when users need it most.

c. Community Mentoring

The third stage aims to ensure that the habits that have been formed are maintained. This program provides cadres of *peer educators* who are recruited from selected *CuanEra* volunteers and placed in adolescents' neighborhoods. These cadres act as discussion partners who are more approachable than teachers or parents, especially when adolescents feel hesitant or embarrassed to discuss financial problems. In addition, a financial consultation post is provided, centered at the *balai banjar* (village community hall) or the village office, as a place where adolescents learn about the long-term risks of digital debt, including the impact of a problematic credit history recorded in the OJK Financial Information Services System (SLIK). For adolescents and families who have already been ensnared by online loans or have a history of bad credit, this post can cooperate with financial institutions, local psychologists, and the complaint post of the Tabanan Police (Polres Tabanan) to provide further assistance.

The relationship between these three stages and the expected outcomes is illustrated in Figure 3. School outreach education and the components within the *CuanEra* application serve as *Gamification Elements* that provide a *Financial Learning Experience* to adolescents. This experience then leads to *Improved Financial Knowledge* and encourages *Better Financial Decision Making*, so that ultimately it contributes to *Reduced Digital Debt Risk*. Meanwhile, community mentoring serves to strengthen every stage so that the behavioral change can be sustained in the long term.



Figure 3. CuanEra Conceptual Framework

Thus, CuanEra not only functions as a financial education medium, but as an integrative approach that combines aspects of knowledge, learning experience, and social support. This framework is also aligned with several national policy directions and development agendas. It supports Presidential Regulation Number 114 of 2020 on the National Strategy for Financial Inclusion by targeting students and youth as important groups in strengthening financial inclusion and literacy. Its focus on improving financial knowledge and responsible financial behavior also contributes to SDG 1 (No Poverty) by reducing financial vulnerability, SDG 4 (Quality Education) through accessible and contextual financial education, and SDG 8 (Decent Work and Economic Growth) by strengthening financial capabilities that can support future economic participation. Furthermore, the framework is relevant to the vision of Golden Indonesia 2045 by contributing to the development of financially capable younger generations. It is also consistent with the 4th and 7th Asta Cita of the Prabowo Gibran administration, particularly in relation to strengthening human resources and supporting a people-centered economy based on cooperatives.

CONCLUSION AND RECOMMENDATIONS

According to the results of the literature review, financial literacy, self-control, and the ability to understand the risks associated with digital financial services appear to be key factors in the financial behavior of adolescents in the digital age. Easy access to services such as installment payments and online loans does not necessarily lead to positive financial behaviors if it is not balanced by adequate financial understanding. Several studies have demonstrated that poor financial literacy, social pressure, and exposure to digital advertising can increase young people's propensity for consumption and imprudent financial decisions.

In addition to improving financial literacy, the study also reveals that educational approaches play a crucial role in the success of financial learning. Methods based on gamification, simulations, and interactive learning have demonstrated their ability to increase participant engagement and help adolescents grasp financial concepts through more realistic decision-making experiences. Based on these findings, this article proposes the conceptual framework of CuanEra, a gamified financial education approach that integrates interactive learning, awareness of digital financial risks, and community support to promote more responsible financial behavior among adolescents.

Based on these findings, stronger collaboration among schools, local authorities, financial institutions, and communities is needed to design financial education programs that better address the specific needs and challenges faced by the digital generation. The implementation of this education should not be limited to the transmission of knowledge, but should also offer practical experience and ongoing support so that adolescents can make sound financial decisions on a daily basis.

Further research is recommended to empirically test the CuanEra framework, particularly through the development of prototypes or concrete intervention programs, in order to more objectively measure its effectiveness in improving financial literacy and reducing the risk of digital debt among adolescents. Furthermore, additional research could consider psychological and social factors, such as self-control, peer influence, and environmental context, to better understand the evolution of adolescents' financial behavior.

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