A Work Project presented as part of the requirements for the Award of a Master's degree in Impact Entrepreneurship and Innovation from the Nova School of Business and Economics.

YARA

Empowering Financial Independence through Personalized, Gamified Education: An Analysis of Solution Feasibility

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16-12-2024

Abstract

Low financial literacy and market participation among young adults in Europe are pressing challenges. This workproject addresses these issues by evaluating YARA, a gamified and personalized financial education platform, as a solution. Using mixed methods, the study investigates YARA's potential to bridge financial knowledge gaps, foster confidence, and empower informed investment decisions. Grounded in theories of personalization, gamification, social learning and simulations, YARA aligns user needs with practical applications. The results demonstrate its effectiveness in promoting financial inclusion and its feasibility in meeting technical, market, and regulatory demands, contributing to systemic change in financial education.

Keywords: Financial literacy, Investments, EdTech, Effectiveness Study, Feasibility Study, Entrepreneurship

1 Introduction

In today's increasingly complex financial landscape, financial literacy and market participation are pivotal for well-being. Yet, young adults across Europe face alarmingly low levels of financial literacy, Portugal reporting average scores barely above 50% (OECD 2020). Limited market participation (Klapper, Lusardi, & van Oudheusden 2015), underscores the need for innovative financial education solutions. In response,YARA emerges as a pioneering solution: a personalized, gamified investment education platform designed to empower young adults with the tools necessary for financial independence. This workproject aims to evaluate the **feasibility** of YARA as a scalable solution to bridge the financial literacy and market participation gap. It evaluates YARA's ability to address barriers and offers implementation recommendations. This workproject serves as a Field Lab project within the Impact Entrepreneurship and Innovation program at Nova School of Business and Economics. This structure blends academic research with practical application. It allows for the detailed examination of YARA's development, from identifying the market opportunity to testing its solution. This research provides insights for financial education and social entrepreneurship, highlighting potential for scalable, impactful solutions for systemic financial challenges.

2 Opportunity Identification

2.1 Problem Identification

Financial literacy and market participation are critical components of personal financial well-being and broader economic stability. Financial literacy empowers individuals to make informed decisions about budgeting, saving, and investing, while active market participation allows them to grow their wealth and secure their financial futures. Despite their importance, many young adults in Europe face challenges in both areas, creating a dual barrier to achieving financial independence and long-term security (Lusardi & Mitchell 2014; OECD 2020).

The financial landscape in Europe reveals troubling trends in **financial literacy**. According to the Standard & Poor's Global Financial Literacy Survey, only 52% of adults in the European Union are financially literate, leaving nearly half the population without sufficient understanding of key financial concepts (Klapper, Lusardi, & van Oudheusden 2015). Similarly, the 2023 Eurobarometer survey reveals that only 18% of EU citizens demonstrate high financial literacy. The European Central Bank (ECB) reports significant disparities across Europe, with financial literacy rates exceeding 70% in countries like Denmark and Sweden but dropping below 30% in Romania and Bulgaria (ECB 2016), with Portugal ranking among the countries with the lowest scores (EU 2023). For younger generations, the problem begins early. The OECD's Programme for International Student Assessment (PISA) reveals that 24% of 15-year-old students in participating European countries lack baseline proficiency in financial literacy (OECD 2020). This indicates a lack understanding of basic financial concepts, leaving individuals ill-equipped to make informed decisions about budgeting, saving, and investing. This gap is particularly pronounced among individuals with lower education and income levels, exacerbating their financial vulnerabilities (OECD 2020).

Despite increased access to financial tools and platforms, **participation in financial markets** remains low in Europe. Only 15% of Europeans own stocks or shares in mutual funds, compared to 55% in the United States (ESBG 2019). A lack of understanding about long-term financial consequences and risk management contributes to this disparity (Klapper et al. 2012). Additionally, the complexity of financial products further deters engagement. A survey by the European Commission (EC) found that 70% of respondents find financial products too complicated to understand (2018). This complexity, combined with limited access to financial professionals, leaves many individuals without the guidance necessary to navigate investment opportunities effectively. In rural and less developed regions of Europe, the ratio of financial

advisors to households can be as low as 1:3,000, significantly hindering market participation (EC 2018). Chatterjee and Fan (2023) note that in such environments, individuals are 35% less likely to participate in retirement savings plans, reinforcing economic inequality. While low financial literacy is widely recognized as a key barrier to market participation, it is crucial to acknowledge that this is not the only factor at play. Even individuals with sufficient financial knowledge may hesitate to invest due to psychological barriers such as lack of confidence, fear of financial loss, or distrust in financial institutions (Guiso & Viviano 2015). Together, these challenges contribute to persistently low market participation rates across Europe, particularly among younger demographics (ESBG 2019). This suggests that addressing financial literacy alone is insufficient for overcoming the barriers to market engagement. These insights reinforce the lack of adequate solutions which aim to empower users not only through education but also by addressing the emotional and psychological factors that inhibit investment behaviors.

The **consequences** of **low financial literacy** and **limited market participation** are far-reaching, affecting both individuals and the broader economy. Many young adults face financial stress and insecurity. According to Deloitte's 2023 report, nearly half of Generation Z (46%) and Millennials (47%) across Europe experience ongoing financial stress, with many, living paycheck to paycheck. In Portugal, the situation is even more critical, with 73% of Generation Z and 67% of Millennials fearing they will not have sufficient resources to retire comfortably (EC 2023). Moreover, poor financial behaviors, such as excessive debt accumulation, are common. The European Consumer Debt Report indicates that the average European household carries €8,200 in consumer debt (ECDN 2020), and only 29% of Europeans report budgeting and tracking their expenses (EC 2018). Poor financial literacy and limited market participation also pose significant threats to economic stability and future financial systems. A key concern is the sustainability of pension systems in Europe. The EC

predicts that the old-age dependency ratio in the EU will rise from 29.6% in 2016 to 51.2% by 2070, placing immense strain on public pension systems (2018). With fewer working-age individuals supporting a growing elderly population, public pensions are expected to become less reliable over time. This challenge is exacerbated by the lack of retirement planning among young Europeans. For instance, only 28% of individuals aged 25–34 have started saving for retirement (EIB 2019). In countries like Portugal, where public pensions are already under pressure, this issue is particularly concerning (OECD 2020). Without sufficient financial literacy or long-term investment strategies, many young adults risk financial insecurity in their later years. At a systemic level, these challenges contribute to reduced economic growth and increased inequality. The OECD (2020) estimates that improving financial literacy could increase GDP growth in European countries by up to 0.2% annually. Additionally, a financially illiterate population may amplify systemic risks by perpetuating cycles of debt and short-term financial thinking.

2.2 Opportunity

The challenges present significant opportunities for innovative solutions that can enhance financial literacy, promote financial inclusion, and address barriers to market participation.

Fintech has transformed the financial landscape in Europe, offering new avenues for financial inclusion. Investments in European Fintech reached €58.1 billion in 2019, highlighting a robust market for digital financial services (KPMG 2020). The widespread adoption of smartphones and improved internet accessibility have made Fintech solutions increasingly accessible, particularly among young, tech-savvy consumers (European Banking Authority 2019). The COVID-19 pandemic further accelerated the shift to digital platforms (McKinsey & Company 2020). A survey by the European Commission (2021) found that 68% of Europeans aged 18–34 prefer digital channels for financial services. This openness to digital platforms aligns with

the preferences of digital natives and creates an opportunity to deliver financial education in ways that resonate with their learning habits (Prensky 2001). The pandemic also underscored the need for financial resilience, making educational tools that build both knowledge and confidence critical for navigating uncertain circumstances. Furthermore, young adults are increasingly seeking tools to help them manage their finances effectively. This demand for tailored solutions highlights the importance of personalization, which allows platforms to address users' specific needs, both educational and behavioral.

Personalization and gamification represent powerful strategies for enhancing learning outcomes, particularly for younger audiences. Clark and Mayer (2016) emphasize that tailoring educational content through effective multimedia design, aligned with learners' prior knowledge and individual needs, can significantly enhance comprehension and retention. Meanwhile, gamification incorporates elements such as points, badges, challenges, and leaderboards to increase engagement and motivation (Hamari, Koivisto, & Sarsa 2014). These strategies directly address the psychological barriers identified in the problem identification section. Furthermore, advancements in technology, such as artificial intelligence (AI) and machine learning, enable the development of adaptive educational platforms that cater to individual users' needs (Holmes et al. 2019). When offering personalized feedback and dynamically adjusting learning paths, AI-powered solutions come as a valuabe support. In conclusion, the rising demand for financial education among young Europeans reflects the risks of financial insecurity and inequality caused by low literacy and limited market participation. Personalized, interactive platforms that address both knowledge gaps and psychological barriers can empower individuals to confidently engage with financial markets.

3 YARA as a Solution

YARA is a mobile application with a mission to democratize financial education by providing young adults with the tools and knowledge necessary to make informed investment decisions. YARA envisions a future in which investment participation is widespread, enabling individuals to build long-term wealth and achieve financial security, by making learning engaging, experimental and social, ultimately aiming to bridge the gap between financial knowledge and practical application.

Unique Value Proposition and Competition

YARA stands out by focusing on four pillars - (1) *personalization*, (2) *gamification*, (3) *community features* and (4) *simulations,* which form the foundation of its unique value proposition. (1) Many financial education tools offer generic content, but YARA dynamically adjusts to users' progress, needs, and knowledge gaps, making it more impactful and engaging. *Personalization* delivers a highly individualized learning experience by leveraging user data to create tailored learning paths. This adaptability ensures that users, regardless of their starting point, receive relevant content and doable tasks. (2) YARA incorporates *gamification* elements, such as points, badges, challenges, and leaderboards, to make learning about finances interactive and enjoyable. These features are grounded in behavioral science principles, such as Self-Determination Theory, which emphasizes the importance of competence, autonomy, and relatedness in sustaining motivation. While gamification is not new, YARA's focus on combining fun with measurable learning outcomes, such as increased confidence and better decision-making, sets it apart. (3) YARA's *social features*, such as group challenges and social benchmarking, foster a sense of community and motivates users. This emphasis on social learning creates an inclusive environment where users can learn from and with their peers, reducing the stigma and intimidation often associated with financial education. (4) YARA

provides hands-on experience through realistic *simulations*, allowing users to test financial strategies in a risk-free environment. These simulations help users develop critical thinking, strategic planning, and decision-making skills applicable to real-world contexts. This not only teaches users theoretical knowledge but also helps them to internalize financial behaviors, bridging the gap between learning and action.

YARA's differentiation lies in its ability to address both informational and psychological barriers. By combining the four pillars, YARA provides a comprehensive and empowering solution for young adults in Europe, serving as a catalyst for financial inclusion, personal growth, and long-term economic resilience. The financial education market in Europe is highly competitive, with numerous platforms offering financial literacy tools. However, the majority of these solutions fail to address the combination of informational and psychological barriers faced by young adults. The analysis of direct and indirect competitors (see Table 2 Appendix) revealed critical gaps in the market like lack of personalization, insufficient attention to barriers to market participation beyond financial literacy, as well as a neglect of social and experimental learning. In summary, YARA's key differentiators are: (1) a holistic approach that integrates education, gamification, community, and simulations; (2) a targeted focus on young adults through an accessible digital platform; (3) an emphasis on psychological empowerment by addressing overlooked barriers such as underconfidence and fear; and (4) scalability, driven by advanced AI technology that adapts to users' evolving needs.

Market Opportunity

YARA operates in a growing market driven by the increasing demand for innovative and accessible financial education tools. The SWOT analysis (see Table 3 Appendix) touched upon in the following section, highlights strategic opportunities arising from favorable market trends. YARA targets young adults aged 18-34 who feel unprepared to invest, by catering to their preferences as digital natives for interactive and mobile-first solutions (Prensky 2001).

This creates an opportunity to integrate financial education into Fintech platforms while engaging users through familiar digital interfaces. The gamification in education market is forecasted to reach USD 6.55 billion by 2028, with a CAGR of 31.29% (Adroit Market Research 2023). This growth, driven by the integration of gamified elements in e-learning platforms and customer-centric business models, positions YARA to capitalize on these trends effectively.

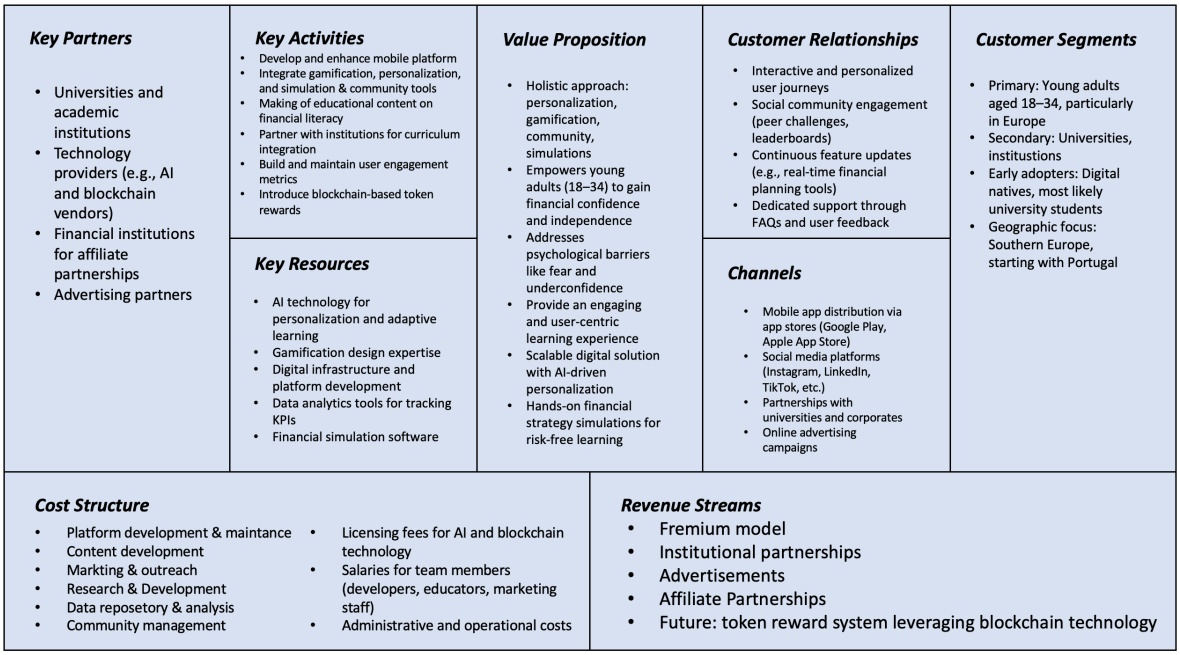
Southern European countries, such as Portugal, offer significant growth opportunities for YARA due to their lower financial literacy rates compared to the European average, as outlined earlier in this paper. This gap increases vulnerability to poor financial decisions and restricts participation in investment markets. Thus, YARA's strategy to initially target the Portuguese market aligns with this opportunity, focusing its efforts where financial education can have the most transformative impact.

The EC's "Capital Markets Union" action plan and events like the "Money Matters" conference in February 2024 highlight policymakers' growing commitment to improving financial literacy across Europe. These initiatives create a favorable environment for YARA, aligning with broader goals of promoting financial inclusion. Moreover, universities and corporate training programs increasingly seek innovative solutions to integrate financial education into their curricula, presenting additional market opportunities for YARA. A PESTEL analysis provides further insights into the broader market context (see Table 4 Appendix).

Business Model

YARA's business model is designed to promote financial inclusion while ensuring profitability. The Business Model Canvas shows all aspects of YARA's business model, which will be partly discussed within this chapter.

Figure 1: Business Model Canvas



The revenue streams are summarized in Table 5, with a comprehensive explanation provided in the appendix (Explanation 1). To summarize, scalability is reflected through a diverse revenue model generated from subscriptions, institutional partnerships, advertisements, and affiliate programs.

Table 5: Revenue Streams of YARA

FREEMIUM		INSTITUTIONAL PARTNERSHIPS		NON-INTRUSIVE ADVERTISEMENT		AFFILATE PARTNERSHIPS	
FREE FEATURES	PREMIUM FEATURES	LICENSING AGREEMENT	WHITE-LABEL SOLUTIONS	SPONSORED CONTENT	SPONSORED SIMULATIONS	FINTECH APPS, BUDGETING TOOLS, NEO-BROKERS	COMISSION-BASED

YARA's success is evaluated using key performance indicators such as active monthly users, retention rates, and measurable improvements in investment literacy. These metrics assess the

platform's effectiveness in driving user engagement and educational impact. A detailed breakdown of the main costs is provided in Table 6, with further in-depth explanations found in the appendix (Explanation 2).

Table 6: Main Costs of YARA:

YARA's digital model enables expansion to other regions with low financial literacy. New features, such as real-time financial planning tools or integrations with brokerage platforms, can be introduced to allow for a broader adoption. To remain competitive and relevant in an increasingly digital and decentralized world, YARA envisions integrating a token reward system at a later point, as a cornerstone of its gamification strategy. This innovative approach aligns with the growing adoption of blockchain technology across industries. This positions YARA to capitalize on broader trends within global financial ecosystems. Institutions such as JPMorgan Chase and Citibank have embraced blockchain for asset tokenization, underscoring a shift toward decentralization and efficiency in asset management (McKinsey 2024; PwC 2024). By integrating diverse revenue streams, YARA's business model ensures both profitability and progress toward its mission. Through its innovative approach, YARA positions itself as a leading platform for empowering individuals to achieve financial independence and inclusion.

4 Methodology

This research employs a two-fold methodology, a literature review, and a survey-based empirical analysis to ensure a robust foundation, to assess the effectiveness and feasibility of our proposed solution called YARA. The **qualitative research** was conducted using peer-

reviewed journals, industry reports, and academic publications accessed through platforms such as ResearchGate, Google Scholar, and ScienceDirect. All search terms used are displayed in Table 7 of the Appendix. This guided the research and narrowed the focus for the quantitative research.

The **quantitative research** was designed to gather empirical data across five dimensions: demographic information, self-assessed and actual financial literacy, learning and motivational preferences, and acceptance and perceptions of app features. The survey solely focused on collecting demographics on participants' age and location. Since YARA targets young adults (aged 18–30) as its core user group, the survey provided a data-driven foundation to confirm its audience. Similarly, analyzing location helped identify regions with significant gaps in financial literacy, ensuring YARA's focus on areas where its platform can create the most substantial impact. The decision to collect only limited demographic information, was intentional to maintain the survey's focus on the critical dimensions. By narrowing the scope, unnecessary complexity was avoided, reducing participant fatigue and increasing the likelihood of high-quality responses.

To assess participants' financial literacy, we adapted questions from standardized evaluations widely recognized in academic studies. These questions covered essential financial concepts such as inflation, compound interest, and diversification, ensuring the survey aligned with established global measures of financial knowledge. Specifically, most questions were drawn from the OECD (2012) paper, evaluating financial literacy, behavior, and attitudes across 14 countries (Atkinson & Messy 2012). The OECD framework was chosen for its credibility and comprehensive approach to financial literacy, making it a reliable baseline for our study. However, to better reflect the specific context of European participants, three of the original eight questions were replaced with items from the work of Lusardi and Mitchell (2011), which focuses on financial literacy among young adults across various countries. This ensured the

questions were relevant and valid for the target demographic. All questions can be found in Table 8 in the Appendix.

The survey also explored participants' learning approaches and motivational drivers, drawing on well-established theoretical frameworks to ensure a robust methodology. Questions assessing learning approaches are based on Kolb's Experiential Learning Theory (ETL) (1984), which identifies four distinct styles: active experimentation, reflective observation, abstract conceptualization, and concrete experience. Similarly, questions examining participants' motivation when learning something new are rooted in the Self-Determination Theory (Deci & Ryan 1985). This framework categorizes motivation into four types: intrinsic motivation (driven by personal interest), extrinsic motivation (driven by external rewards), relatedness (seeking social connection), and competence (aiming to master a skill).

As will be discussed, community features play a critical role in fostering motivation and confidence in financial education. Therefore, this study selected Peer Performance Tracking (PPT) as the specific feature for analysis. To evaluate the acceptance and effectiveness of PPT as a feature, the Technology Acceptance Model (TAM) was utilized. TAM was selected for its robust theoretical foundation and proven applicability in analyzing user acceptance of new technologies (Marangunić and Granić, 2015). By focusing on the constructs Perceived Usefulness (PU), Attitude Toward Using (ATU), and Behavioral Intention to Use (BI), the model allowed for a structured exploration of users' perceptions and engagement intentions. Unlike broader models, TAM focuses directly on user acceptance and is well-suited to assess features. The decision to exclude Perceived Ease of Use (PEOU) was driven by the absence of a minimum viable product (MVP), allowing the analysis to prioritize factors directly tied to adoption.

Multiple questions per construct minimized bias and improved reliability. A 7-point Likert scale was used, which encourages participants to make nuanced judgments instead of

defaulting to a neutral option (Preston & Colman 2000). This approach improves data quality by capturing a more detailed spectrum of responses and reducing central tendency bias. Lastly, we included two targeted questions to explore participants' perception of specific features of PPT (7-point scale) and their comfort in receiving investment advice from artificial intelligence (AI) (5-point scale). The survey script can be found in the appendix.

Participant Recruitment and Data Collection

The survey targeted individuals across diverse demographics, with a particular emphasis on young adults aged 18–30 in Europe, as this group aligns closely with YARA's mission. However, responses were also collected from older participants to gain a broader understanding of user preferences and needs. Participants were recruited through social media platforms (WhatsApp, LinkedIn, Instagram) and academic networks (student clubs and wider student communities). The predominance of university students in the sample likely reflects YARA's early adopter group. However, this also skews the findings toward a demographic with relatively high financial literacy compared to the general population, likely reflecting a well-educated and potentially privileged group. To maximize accessibility and response rates, the survey was hosted online and designed to take approximately 6–8 minutes to complete. Ethical research standards were followed, with anonymity maintained throughout the data collection process. Although participants were informed at the outset that completing the survey implied consent, no formal written consent was obtained. We set a minimum sample size objective of 100 responses, which we successfully achieved within one week of the survey's publication. The final data analyzed included 110 respondents.

Data Analysis

The analysis of survey data followed a systematic and multi-step approach designed to ensure robust and meaningful insights. The process employed SPSS for statistical analysis, leveraging

techniques like descriptive statistics, reliability testing, correlations, regression analysis, and advanced methods like ANOVA and post-hoc testing. The following sections detail the methodology applied in each analytical step.

To ensure consistency and clarity in the dataset, a data-cleaning process was conducted which consisted of four critical steps. **First**, non-essential data such as participant identification numbers and timestamps (completion time, start time, and last modified) were deleted to maintain privacy and focus on the relevant variables. **Second**, clear and concise variable names were created for each survey question, making the dataset easier to navigate. **Third**, nominal qualitative responses were converted into numerical values to facilitate statistical analysis. This transformation ensured compatibility with SPSS and enabled advanced statistical techniques. **Finally**, different response scales were standardized to ensure uniform weight across all questions, which was critical for meaningful comparisons and aggregations.

The analysis included metrics such as mean, standard deviation, minimum, and maximum values, offering insights into the sample's characteristics. The actual financial literacy score (ActualFLScore) was created by summing correct answers to financial literacy questions, providing an objective measure of participants' knowledge.

Confidence levels were then calculated by comparing perceived and actual financial literacy to identify mis- or alignment in self-assessment, while a categorical variable (Confidence Categories) was introduced to classify participants as underconfident, aligned, or overconfident. These steps established a solid foundation for understanding trends. Following the latter, a Paired Samples T-Test was performed to compare participants' self-assessed financial literacy with their perception of their peers' financial literacy. This method was chosen because it evaluates the mean differences between two related measurements for the same participants, providing insight into the potential biases or confidence gaps.

The TAM constructs (PU, ATU, BI) were validated through a multi-step process to ensure that the survey items reliably measured the intended concepts. Composite variables for each construct (PUScore, ATUScore, and BIScore) were calculated by averaging the responses to individual questions, creating unified scales for subsequent analysis. Reliability testing was conducted using Cronbach's Alpha, which confirmed high internal consistency for all constructs, with values exceeding the commonly accepted threshold of 0.7. This means that the survey questions grouped under each construct are closely related and measure the same theoretical concept. Correlation analysis was employed to examine the relationships between the constructs. This analysis was crucial in confirming the theoretical relationships proposed by TAM, where PU influences ATU and BI, and ATU further influences BI. The correlation analysis helped determine the strength and direction of these relationships without inferring causality, offering a foundation for subsequent regression testing. This step provided initial validation of TAM's theoretical framework and informed further investigation into the predictive relationships between the constructs. In addition, two linear regression models were developed to test the predictive relationships between TAM constructs. The first model examined whether PU (Independent Variable) influenced ATU (Dependent Variable), while the second model assessed the combined impact of PU and ATU (Independent Variables) on BI (Dependent Variable). Linear regression was chosen because it is well-suited for analyzing continuous variables and determining causality. Key metrics such as R-Squared values, standardized beta coefficients, and p-values were reported to evaluate the significance, strength, and explanatory power of the relationships. This analysis provided a detailed understanding of how TAM constructs interact and drive user engagement.

Furthermore, descriptive statistics for the motivational drivers (intrinsic motivation, extrinsic motivation, relatedness, and competence) were calculated to establish a baseline understanding of participants' motivational tendencies. The mean and standard deviation for each driver

provided insight into the overall distribution of responses. In addition, to examine the alignment between motivational drivers and learning preferences, cross-tabulations were performed, followed by Chi-square tests to determine statistical significance. Moreover, ANOVA was conducted to explore whether different motivational drivers, such as intrinsic motivation, extrinsic motivation, relatedness, and competence, significantly influenced the TAM constructs. This analysis assessed whether motivational groups differed in their scores for PU, ATU, and BI. Post-hoc testing using the Tukey HSD method was performed when significant differences were detected, enabling a detailed comparison of how specific groups varied. This analysis provided actionable insights into how motivational factors impact user acceptance and engagement with YARA's features. To analyze the relationship between motivation and preferences for specific features within PPT, descriptive statistics, ANOVA, and correlation analysis were conducted. Descriptive statistics summarized mean scores for feature preferences, while ANOVA identified whether motivational drivers significantly influenced these preferences. Homogeneous subsets were created to group participants with similar motivations. Finally, correlations between confidence levels and feature preferences were analyzed to explore whether participants' confidence in financial literacy influenced their interest in specific features. This step provided valuable insights into user preferences and informed strategies for feature design and personalization.

This combined approach evaluates YARA's effectiveness and feasibility. While the literature review provided a theoretical foundation, the survey offered empirical evidence to validate and refine the proposed features of YARA. This approach ensures that the analysis is grounded in both established research and real-world insights. Together, these methods enable a holistic evaluation of YARA's potential, supporting its mission to create an innovative and impactful platform for financial literacy.

6 Feasibility of Solution

The feasibility of implementing YARA's solution is assessed in this chapter, building upon insights from the survey findings which have been partly introduced in the effectiveness study. While the effectiveness section focused on identifying features and strategies that optimize user engagement and adoption (personalization, gamification, community features, simulations), this section evaluates the feasibility of their implementation. The analysis considers the solution from multiple dimensions, including technical, market, legal, and financial, ensuring a comprehensive understanding of the constraints and opportunities YARA may encounter. This analysis ensures that YARA's development strategy aligns with user expectations, operational capacities, and industry standards, ultimately enhancing its viability as a platform for democratized financial education. This chapter is organized as follows; the technical feasibility evaluates the technological requirements and capabilities for implementing proposed features. The market feasibility assesses user adoption strategy, industry trends, and competitive positioning. The legal and regulatory feasibility examines compliance with relevant financial and technological regulations. Finally, the financial feasibility evaluates the required resources alongside diversified funding strategies. By addressing these dimensions, the feasibility analysis provides a roadmap for translating YARA's innovative vision into a scalable and sustainable venture.

6.1 Technical Feasibility

Feature Implementation and Alignment with User Preferences

To ensure that YARA effectively meets the diverse needs of its target audience, the following part evaluates technological needs of implementing key features and their alignment with user motivations and confidence levels. *Peer progress tracking* was selected as a focal point for analysis due to its dual role in fostering community engagement and individual skill

development. The PPT concept comprises four distinct yet interconnected features that cater to various aspects of user interaction: (1) *non-competitive individual performance tracking* (= emphasizing personal progress without introducing competition); (2) *milestone highlighting* (= displaying specific achievements reached by peers to inspire and guide users); (3) *anonymous progress comparison* (= comparing progress anonymously without revealing personal data); (4) *customizable peer views* (=enabling users to choose whose progress they see, such as friends or peers with similar goals). These features were evaluated against four key motivational drivers identified in the study: (1) *achieving personal goals or mastery of a skill***,** (2) *earning rewards or recognition***,** (3) *collaborating or connecting with others during learning***,** and (4) *feeling competent and able to apply what I've learned quickly.* The rationale for analyzing these PPT features lies in understanding whether users with different motivational drivers exhibit varying preferences for these functionalities. This analysis aims to inform both design priorities and technical feasibility by identifying the technological requirements and resources needed to implement features that resonate with user preferences.

The analysis shows that non-competitive tracking appeals broadly across user groups, regardless of their motivational tendencies. This indicates that users value the ability to view peer performance in a non-competitive setting, fostering inclusivity. Similarly, peer milestone highlighting resonates universally, as users across all motivational groups appreciate seeing key achievements of their peers. These findings align with insights from the effectiveness analysis, which emphasized the importance of creating a safe and supportive learning environment. By integrating milestone achievements into YARA as a core feature, such as through leaderboards that emphasize progress rather than competition, YARA can foster a sense of healthy motivation, addressing the global preference for non-competitive approaches. Users who are intrinsically motivated, and, therefore, driven by achieving personal goals or mastery of a skill, highly value anonymity. Similarly, those who prioritize feeling competent

quickly and applying what they've learned also show a strong preference for anonymity. In contrast, users motivated by rewards and recognition, as well as those who value collaboration, do not exhibit a preference for anonymity. This highlights distinct learner profiles and underscores the importance of tailoring the learning journey to meet their differing needs.

For example, YARA could segment users into two motivational groups. Type 1 learners, driven by personal goals and practical application of knowledge, would benefit from features that emphasize a private and anonymous learning environment, allowing them to focus on self-improvement without external pressures. Type 2 learners, motivated by rewards and collaboration, could thrive in a more interactive and social setting. For these users, customizable peer views, emerging as the most favored feature for users who learn by collaborating or connecting with others, can be prioritized. Additionally, YARA could introduce group challenges, peer-led learning forums, or collaborative goal-setting tools that encourage shared progress and recognition.

The analysis also extended to evaluating feature preferences in relation to user confidence levels, as a lack of confidence significantly retains users to engage with investment tools in the first place, as they perceive themselves to be incapable. The findings indicate a weak tendency for higher-confidence participants to favor non-competitive environments, suggesting that they value these peer comparisons to affirm and validate their abilities without feeling challenged or threatened. In contrast, less confident users are more likely to benefit from anonymous benchmarking, as it reduces intimidation and lowers the psychological barriers to participation.

Technical Requirements

To effectively address the diverse preferences of its user base and deliver on its vision of gamified and personalized financial education YARA must prioritize an adaptive and scalable technical infrastructure. The analysis highlighted the need to accommodate two distinct user

types: goal-oriented, private learners and collaborative, reward-driven learners. To support these diverse needs, real-time data processing is essential for YARA's key features such as peer progress tracking and group challenges, as these rely on up-to-date information to function effectively. Delays or outdated data can create frustration, reduce trust in the platform, and undermine the utility of the feature. Furthermore, the feedback loops identified in the effectiveness analysis, including personalized messages, progress updates, areas of improvements, and achievement notifications, must be responsive to user input. Ensuring this level of responsiveness is critical to maintaining user satisfaction and fostering long-term engagement (Farman 2018).

Building on this need for responsiveness, personalization forms a cornerstone of YARA's strategy by leveraging advanced machine learning models capable of analyzing user behaviors and preferences (Martín et al. 2021). These models can enable the platform to dynamically adjust its features based on individual profiles. For instance, YARA can adapt learning recommendations to whether a user prefers private, self-paced learning environments or more interactive, collaborative settings. By integrating real-time feedback with AI-driven personalization, YARA can deliver tailored experiences that feel intuitive and impactful, fostering sustained engagement and better outcomes for its diverse audience.

Building on diverse user preferences, incorporating features that prioritize anonymity, such as anonymous benchmarking, is critical. This involves implementing end-to-end encryption to secure data transmission and deploying anonymization algorithms to safeguard user identities during peer comparisons (Panadero and Jonsson 2018). These measures ensure that users who prefer private learning environments can engage confidently, knowing their data is protected.

A well-designed interface is critical to supporting these features. For customizable peer views, the interface must enable seamless toggling between private and public settings or allow users to choose specific peers to track. Flexibility is essential to cater to distinct user needs, ensuring

inclusivity and usability across all motivational and confidence profiles. Additionally, the overall design must be intuitive, visually appealing, and engaging to encourage sustained use. Since gamification is a central pillar of YARA, the interface should incorporate interactive elements such as badges, progress bars, and leaderboards in a way that motivates users while avoiding overwhelming complexity.

Scalability is another key consideration for YARA's technical infrastructure. As the platform grows, it must maintain consistent performance under varying user loads. This requires scalable server architectures and load-balancing mechanisms to ensure system responsiveness, even during peak usage periods (Neghabi et al. 2018). Real-time features, such as peer progress updates and milestone achievements, depend on this stability to function effectively and maintain user trust. Any delays or system disruptions could significantly impact the user experience, particularly for features that rely on instantaneous feedback.

Framework for Future Development

The following framework provides actionable strategies for YARA's development. Inspired by Gina Gotthilf, former VP of Growth at Duolingo, YARA's framework emphasizes building an MVP and refining features through iterative testing. Gotthilf highlights the importance of a disciplined A/B testing culture to identify what drives user engagement and retention, viewing experimentation and learning from failures as essential to optimizing the user experience (First Round Review, n.d.). Though these strategies are not yet implemented for YARA, due to resource and time constraints, they establish a solid foundation for future development efforts.

Iterative Testing and Strategic Experimentation

YARA's development strategy must prioritize iterative testing and strategic experimentation, particularly through rigorous user behavior testing during onboarding. The decision to require user sign-up either before or after demonstrating the app's value can significantly influence

retention. Hypotheses should be formed around the precise moment when users experience the app's core value, for example, after completing their first financial literacy lesson. Testing might involve introducing "soft walls" (prompts to sign up) at strategic points throughout the user journey, gradually transitioning to "hard walls" (mandatory sign-ups) once the value proposition is clear. The technical implementation of these dynamic sign-up walls must leverage real-time data to adjust their placement based on user drop-off rates. For instance, early tests can analyze whether users disengage at the sign-up stage or progress further when soft walls are used. This iterative approach not only enhances the onboarding experience but also generates valuable insights that can inform improvements across other platform features. For example, testing feedback timing can reveal broader patterns about when users are most receptive to prompts or interventions. By continuously applying learnings across features, YARA ensures an adaptive and user-centric development process that evolves with the needs of its audience.

Continuous Feedback Loops and Gamification Refinement

Feedback loops are central to YARA's strategy for optimizing user engagement and promoting effective learning, as highlighted by best practices at Duolingo. The importance of feedback loops is further underscored in the effectiveness analysis, stressing how effective feedback can reinforce positive behavior, create a sense of accomplishment, and motivate further progress. In addition, regular user feedback also allows for the early detection of inefficiencies or problems, enabling quick adjustments that save time, resources, and energy. Ultimately, feedback loops ensure growth, improvement, and alignment with desired outcomes. They're the foundation for progress in an app such as YARA.

Encouraging Habit Formation

The success of YARA hinges on its ability to create an engaging, user-centered experience that transitions financial learning from a one-time effort to an ongoing behavior. YARA can foster this by enabling users to set personalized goals, such as completing a specific number of lessons weekly. These goals should be broken into manageable steps to ensure they feel achievable, fostering a sense of progress and motivation. Additionally, smart notifications can prompt re-engagement at optimal times, such as when users typically interact with the app or when they are close to achieving a milestone. These notifications should strike a balance between being helpful and non-intrusive, providing encouragement rather than pressure.

6.2 Market Feasibility

The market feasibility analysis evaluates YARA's potential to successfully target and engage its intended user base. This evaluation is rooted in a comprehensive assessment of user engagement factors, with a particular focus on Peer Progress Tracking (PPT) as a key feature. By analyzing how TAM constructs PU, ATU, BI—interact with users' motivational drivers, this section demonstrates how PPT influences user engagement and adoption. The findings provide actionable insights into how YARA can effectively address its audience's needs, ensuring its features align with user expectations and preferences.

To identify potential target audiences for YARA, we calculated financial literacy scores across key demographics, enabling a data-driven understanding of the groups that would benefit most from the platform. Participants aged 31 and above exhibited the highest financial literacy scores (7.5–7.6 out of 8), with low variability indicating consistent knowledge. In contrast, participants under 18 demonstrated the lowest average scores (4.50) and the widest variability, emphasizing the need for foundational education. Young adults aged 18–25 showed strong performance (mean = 7.30), while those aged 26–30 presented a broader range of literacy levels (mean = 7.00). Given the variability in financial literacy levels among the 18–30 age group,

this demographic emerges as a key target for YARA. Their diverse user profiles highlight the need for tailored approaches. To effectively engage this audience, YARA should implement clear onboarding processes to capture initial interest and personalize the learning journey, as a one-size-fits-all approach would fail to address their unique needs.

Building on the analysis of age demographics, geographic insights provide additional understanding of YARA's target audience. The findings highlight Southern Europe as a strategic starting point due to its lower financial literacy scores (mean = 6.90) compared to Eastern and Western Europe (mean scores: 7.50 and 7.36, respectively). This gap suggests that foundational financial education is underdeveloped in Southern Europe. Northern Europe, despite having the lowest mean score (6.75) and the highest variability (SD = 1.89), contrasts with broader studies ranking the region among the EU's most financially literate, suggesting limitations in sample representativeness.

Evaluating PPT Through TAM: Insights for User Engagement

The earlier effectiveness analysis introduced the TAM as a framework for evaluating the success of PPT within YARA. The findings demonstrated that users perceive PPT features as useful (PU) and hold positive attitudes toward using them (ATU). However, a moderate gap was observed between these positive attitudes and users' intention to use the platform (BI). This suggests that while users recognize the value of PPT, external factors or perceived barriers might hinder their intention to engage with it. This observation raises a critical question: *How do these constructs influence one another, and what does this mean for user adoption?* To answer this, TAM provides a theoretical foundation through two models:

1. **Model 1 (PU → ATU):** TAM posits that PU influences attitude toward use (ATU). Users who perceive a feature as useful are more likely to develop positive attitudes toward it.

2. **Model 2 (PU, ATU → BI):** Both PU and ATU predict BI. This indicates that perceived utility and favorable attitudes jointly drive the likelihood of user engagement.

The results of Model 1 reveal that perceived usefulness strongly predicts users' attitudes toward using PPT. This underscores the importance of designing features that clearly demonstrate their utility, such as improving learning outcomes or fostering engagement. By ensuring that users recognize the tangible benefits of PPT, YARA can significantly enhance positive attitudes and drive overall user adoption. The results of Model 2 demonstrate that both PU and ATU significantly influence BI. Users who perceive PPT features as helpful (PU) and have a positive attitude toward using them (ATU) are more likely to intend to engage with the platform. While PU remains the strongest predictor of BI, ATU also plays a meaningful role in reinforcing users' intentions. However, the slightly lower and less consistent BI scores compared to PU and ATU suggest that external factors may still impact users' willingness to fully commit to these features. Some users might not see how tracking peers' performance directly aligns with their personal financial goals, reducing their perceived value of the feature. To that end YARA could tailor PPT features to align more closely with users' financial goals. For example, by enabling users to select specific metrics or benchmarks that matter most to them, such as debt repayment milestones or investment growth. This strategy directly supports market feasibility by ensuring that YARA resonates with its audience, fostering engagement and retention. Offering free trials or introductory incentives could encourage initial use and demonstrate value. Providing testimonials or success stories could further build trust and showcase the platform's impact. To strengthen the attitude towards using, YARA should focus on creating an engaging and enjoyable user experience to strengthen users' emotional connection to the platform and encourage sustained engagement.

Exploring the Relationship Between TAM Constructs and Motivational Drivers

This section aims to analyze how users' motivational drivers ("Achieving personal goals," "Earning rewards," "Collaborating with others," and "Feeling competent") influence their perception of the app's value and their likelihood of engaging with it.

The results indicated that motivation significantly influences attitudes and behavioral intentions toward peer progress tracking features, providing key insights into user engagement strategies. Users across all motivational groups perceived peer progress tracking as moderately useful indicating broad agreement on the feature's utility, regardless of users' primary motivations. Reward-driven users reported slightly higher PU scores reflecting that these individuals may perceive the PPT to gain recognition. For example, seeing milestones or comparative achievements could align with their motivation to earn rewards, as these indicators provide tangible markers of success or progress. These tangible incentives, make gamified elements like badges, milestones, and skill certifications essential to sustain their engagement. Collaboration-driven users exhibited the highest positive attitudes towards using PPT which reflects that these users are likely motivated by the social and interactive aspects of the feature. PPT aligns well with their desire to connect with others, share progress, and engage in collective learning experiences. By fostering a sense of community YARA can enhances their attitudes toward the feature. The higher intentions to adopt the feature among reward-driven and collaboration-driven users reflect that these groups perceive clear alignment between the feature's functionalities and their intrinsic or extrinsic motivations. Reward-driven users may see PPT as a mechanism to work toward predefined goals and see tangible results of their efforts, while collaboration-driven users likely value the teamwork and shared progress that the feature fosters. This indicates that PPT resonates more strongly with users who seek external validation or thrive in community-oriented environments. While the TAM analysis highlights the appeal of PPT to reward-driven and collaboration-oriented users, YARA must also address the needs of mastery-driven users, and those who value autonomy and self-directed learning.

These users are more likely to engage with features like private progress dashboards and individualized goal-setting tools, which align with their preference for independent achievement of competences. This underscores the importance of developing a multifaceted platform that accommodates a range of motivational drivers, ensuring that every user finds value in the learning journey YARA offers.

Industry Rivalry

The market for investment education is characterized by a diverse range of players, from gamified apps to trading platforms and community-based educational initiatives. While competitors like Zogo Finance, eToro Academy, and Female Invest have established themselves as key actors, they fail to comprehensively address the needs of novice investors or cater to the psychological barriers faced by underconfident learners. Zogo Finance, for instance, excels in using gamification to engage users through short lessons and tangible rewards. However, its focus is largely on general financial literacy, and its content lacks the depth and specificity needed for investment education. Similarly, eToro Academy integrates financial education into its broader trading platform, but its educational tools are secondary to its primary function as a trading facilitator. Female Invest, meanwhile, emphasizes empowering women in finance through community-based learning, yet its offerings lack the gamified, adaptive features that sustain engagement over time. Platforms like Investmate simplify complex financial concepts but fail to incorporate interactive learning journeys or personalized content, limiting their appeal to diverse learner profiles.

YARA distinguishes itself by addressing the gaps left by these platforms. Its gamified approach transforms investment education into an engaging and enjoyable process, fostering sustained interest and motivation. Unlike competitors that rely on static lessons or general content,

YARA employs advanced personalization to tailor learning paths to individual users' goals, progress, and confidence levels. Community features, such as peer tracking and collaborative progress sharing, create a supportive learning environment that mitigates the intimidation often associated with financial learning. Furthermore, YARA's simulation-based tools provide a risk-free platform for users to practice investment strategies, bridging the gap between theoretical understanding and real-world application. What sets YARA further apart is its focus on building user confidence, a critical factor highlighted in the survey findings. The analysis revealed significant gaps between perceived and actual financial literacy, with many users underestimating their abilities. By addressing these gaps through adaptive content and psychological reinforcement, YARA positions itself as a platform that not only educates but also empowers its users. This focus on confidence-building is largely absent in competing platforms, giving YARA a strategic edge.

Another aspect of YARA's differentiation lies in its geographic focus. While many competitors operate in established markets such as North America, YARA targets underserved regions like Southern Europe, where financial literacy rates are significantly below the European average. By tailoring its approach to the unique needs of these markets, YARA combines localized relevance with cutting-edge technological features, creating a compelling value proposition.

6.3 Legal and Regulatory Feasibility

YARA's primary focus on investment education, rather than financial advisory services, strategically positions it outside the scope of financial regulations that require registration and supervision by entities such as CMVM in Portugal. As YARA does not engage in financial product transactions or intermediation, it avoids the need for compliance with CMVM's systems BUE. To maintain this status, YARA must ensure that all content explicitly states its educational purpose and clearly differentiates itself from financial advisory services. Disclaimers accompanying simulations and lessons will reinforce that these tools are designed

for learning purposes only and do not predict real-world investment outcomes. This distinction avoids legal ambiguities, allowing YARA to operate confidently as an educational platform. Additionally, all gamification elements, educational content, and financial simulations used within YARA must either originate in-house or be appropriately licensed if sourced externally.

Balancing Personalization with Data Privacy and Compliance

Another significant challenge is ensuring that personalized recommendations are accurate and unbiased. Inaccurate advice can mislead users, potentially resulting in poor financial decisions. Algorithms used for personalization may inadvertently incorporate biases present in the data or their design (Akter et al. 2022). To mitigate these risks, YARA will have regular algorithm audits, meaning that routine checks and updates will be implemented to identify and correct biases or errors in the algorithms. In addition, YARA will involve financial experts in developing and reviewing content to ensure alignment with sound financial principles. Finally, YARA shall provide clear explanations of how recommendations are generated to enhance trust. Notably, survey insights suggest a positive trend in user comfort with AI-driven financial tools. Participants rated their comfort levels with receiving AI-generated investment advice on a 5-point Likert scale, resulting in a mean score of 3.79. This indicates a neutral to confident sentiment, reinforcing the importance of transparency in fostering trust and acceptance of such technologies.

Personalization relies on collecting and analyzing learners progress, and potentially sensitive information related to financial knowledge or goals. Users may hesitate to share sensitive financial information due to fear of data breaches or misuse (Lee et al. 2022). This makes adherence to data privacy regulations, such as the General Data Protection Regulation (GDPR)

in the EU, essential. YARA must obtain explicit consent from users for data collection and processing, collect only necessary data and employ techniques to anonymize personal information to minimize privacy risks. Users shall always have access to correct or delete their data as required by law (GDPR.EU 2024). Failure to comply could lead to legal penalties and loss of user trust, which could have drastic consequences. By implementing GDPR-compliant practices, such as encryption and transparency in data use, YARA will be able to mitigate these risks.

6.4 Resource Requirements and Financial Feasibility

The successful implementation of YARA's platform relies on a strategic alignment of technical, human, financial, and marketing resources, ensuring the delivery of its unique gamified, personalized, and simulation-based approach to financial education. This section evaluates the resource allocation framework essential for sustaining YARA's operations and growth while addressing funding strategies to ensure financial feasibility.

YARA's innovative features demand a robust and scalable technical foundation. Real-time data processing ensures adaptive learning experiences, while machine learning models underpin personalization capabilities. Advanced encryption protocols and anonymization algorithms safeguard user privacy (Arora and Khare, 2024). A scalable cloud-based infrastructure is also critical to handle growing user demand and ensure platform stability during peak periods.

Human capital forms the cornerstone of YARA's development. A multidisciplinary team of skilled developers, machine learning experts, gamification specialists, and UX/UI designers will drive the platform forward. Emerging tools like ChatGPT can augment resource efficiency by automating tasks such as drafting privacy policies, performing regulatory checks, and generating personalized learning content. This allows human specialists to focus on strategic

activities, supporting a lean development model (Soori et al., 2024). While AI cannot entirely replace expert oversight, it helps balance resource constraints with scalability and efficiency.

An effective marketing strategy is equally critical to establish YARA as a trusted brand and attract early adopters. Early marketing costs will focus on digital campaigns, social media promotions, and influencer partnerships targeting young adults (Keller, 2009). Collaborations with universities and financial influencers can further boost credibility and visibility. Organic growth through SEO, content marketing, and engaging educational resources will complement paid advertisements, ensuring efficient outreach (Chaffey & Ellis-Chadwick, 2019).

Financial feasibility remains a key consideration. Substantial upfront investments in development, operations, marketing, and compliance are necessary. Development costs include designing and testing functionalities, integrating personalization algorithms, and conducting iterative user testing. Operational costs focus on maintaining infrastructure reliability and scaling capacity with user growth. Marketing costs are critical for creating brand awareness and attracting an initial user base. Finally, compliance costs, such as adhering to GDPR, can be reduced through AI integration, ensuring cost efficiency while meeting regulatory standards.

To address financial demands, YARA will pursue diversified funding. Accelerators and incubators like Startup Lisboa and Casa do Impacto offer funding and mentorship tailored to socially impactful solutions. VC funding, particularly from Southern European firms in fintech and educational innovation, provides opportunities to scale. Public grants aligned with EU digital transformation initiatives reduce reliance on equity-based funding.

7 Conclusion and Impact Assessment

YARA bridges the gap between financial literacy and practical application, transforming financial education into an engaging and inclusive experience. Through *personalization*,

YARA directly tackles inequalities of opportunity and underconfidence, by aligning content with users' knowledge levels. Adaptive learning systems increase relevance and retention while reducing overwhelm. It further helps bridge the gap between perceived and actual financial literacy through feedback mechanisms. This approach benefits individuals and addresses systemic challenges in financial education, promoting equitable access to resources and broader financial inclusion. *Gamification* enhances engagement by making financial education enjoyable and interactive. By motivating consistent participation through reward systems, YARA fosters knowledge retention and positive behavioral change, helping users develop lifelong financial skills and sustainable habits. *Community-driven features* create a collaborative learning environment where users build confidence through peer benchmarking and group challenges. By fostering a sense of belonging and reducing intimidation, YARA transforms financial literacy into a shared cultural norm, driving sustained **engagement** and **long-term impact**. *Scenario-based simulations* provide practical, risk-free learning experiences, which cater to diverse learning styles, particularly active experimentation. Simulations ultimately support users to apply financial concepts in real life, by fostering **confident decision-making**. YARA's **feasibility analysis** reveals a strong alignment of technical, market, financial, and regulatory dimensions, demonstrating the viability of its implementation. Survey insights identify significant financial literacy gaps, particularly in Southern European markets, highlighting YARA's ability to serve underserved demographics. By prioritizing gamification, personalized learning journeys and community-driven features, YARA effectively caters to distinct motivational profiles while empowering underconfident users, which is a key differentiator from competitors like eToro Academy, which focuses on trading rather than education. This strategic focus on fostering **confidence** and **inclusivity** positions YARA to address psychological barriers often overlooked in financial education. Financial sustainability can be achieved through a **diversified funding strategy**, including

accelerators like Startup Lisboa and Casa do Impacto, as well as venture capital targeting fintech and educational innovation. In addition, YARA's exclusive focus on **education** ensures a clear differentiation from advisory services, avoiding complex financial regulations, while adherence to GDPR safeguards user trust and data privacy. The analysis demonstrates that YARA's innovative approach to financial education has the potential to drive **systemic change**, empowering users and transforming how financial literacy is accessed and experienced. YARA's **broader impact** lies in empowering individuals to achieve financial independence, igniting a systemic transformation in financial literacy and enhancing market participation. This dual impact aligns with several United Nations Sustainable Development Goals (SDGs). Through an engaging and adaptive platform, YARA promotes equitable and high-quality education, supporting **SDG 4** "Quality Education." By equipping young adults with the tools to make informed investment decisions, YARA fosters economic resilience, sustainable growth, and increased market participation, contributing to **SDG 8** "Decent Work and Economic Growth." Additionally, its focus on underserved populations and regions with low financial literacy or market participation directly reduces inequalities, aligning with **SDG 10** "Reduced Inequalities." YARA's collaboration with educational institutions, financial organizations, and policymakers amplifies its impact, addressing systemic challenges and supporting **SDG 17** "Partnerships for the Goals." By aligning with these SDGs, YARA demonstrates its commitment to fostering financial inclusion and economic empowerment. Its scalable, innovative approach positions it as a leading tool for democratizing financial education and driving sustainable global change.

8 Limitations and Future Outlook

This research, while providing critical insights into YARA's solution, its effectiveness and feasibility, is not without its limitations. These constraints stem from the sampling strategies

and methodological choices, which, although purposeful, inevitably shape interpretations of the findings. Recognizing these limitations is essential for contextualizing the results and guiding future research. **First**, the sampling strategy leaned heavily on university networks and social media channels, which predominantly attracted educated young adults. While this approach ensured access to respondents familiar with digital tools, it inadvertently excluded underserved populations, particularly those with lower levels of financial literacy. This bias limits the generalizability of findings to the demographic landscape. Thus, future research should prioritize more inclusive recruitment strategies, specifically to those from underrepresented socioeconomic and cultural contexts to capture a diverse range of user experiences. **Second**, while the survey incorporated demographic measures, it did not include additional demographic variables, such as socioeconomic status or professional background. These variables could provide deeper insights into the contextual factors influencing financial literacy and engagement. This would allow for a more nuanced understanding of user needs and better inform YARA's content development strategy. The study's focus on a pan-European context also lacked deeper region-specific contextualization. Although Southern Europe, specifically Portugal, was identified as a strategic market with lower financial literacy rates, the cultural and educational nuances of this region were not fully explored in the literature review. Future studies could address this by incorporating region-specific analyses so that YARA's features can be tailored to meet localized needs, including adapting content for language and cultural relevance. Additionally, research on educational content that directly addresses users' specific needs requires further exploration to enhance the platform's educational impact. Another limitation arises from the exclusion of the "Perceived Ease of Use" construct in the TAM. This decision, driven by the absence of an MVP, limited the usability analysis. Thus PEOU should be integrated in future iterations, once a prototype exists. Usability testing will be critical in validating YARA's interface design and functionality,

ensuring alignment with user friendliness. These endeavors would contribute not only to the advancement of the platform but also to the broader field of financial education and inclusion. By acknowledging these limitations, this study not only highlights areas for refinement but also provides a roadmap for future research.

9 References

Adroit Market Research. 2023. Gamification in Education Market by Component, Deployment Type, and Region—Global Opportunity Analysis and Industry Forecast, 2023–2028. November 2023. https://www.adroitmarketresearch.com/industry-reports/gamification-in-education-market.

Akter, Shahriar, Yogesh K. Dwivedi, Shahriar Sajib, Kumar Biswas, Ruwan J. Bandara, and Katina Michael. 2022. "Algorithmic Bias in Machine Learning-based Marketing Models." *Journal of Business Research* 144 (February): 201–16. https://doi.org/10.1016/j.jbusres.2022.01.083.

Arora, Sahil, and Pranav Khare. "The Role of Machine Learning in Personalizing User Experiences in SaaS Products." *Journal of Emerging Technologies and Innovative Research* 11, no. 6 (2024): 1-15. https://www.researchgate.net/publication/381469758.

Atkinson, Adele, and Flore-Anne Messy. 2012. "Measuring Financial Literacy: Results of the OECD/International Network on Financial Education (INFE) Pilot Study." *OECD Working Papers on Finance, Insurance and Private Pensions,* no. 15. Paris: OECD Publishing. https://doi.org/10.1787/5k9csfs90fr4-en.

Bandura, Albert. 1977. "Self-Efficacy: Toward a Unifying Theory of Behavioral Change." *Psychological Review* 84 (2): 191–215. https://doi.org/10.1037/0033-295X.84.2.191.

Brookfield, Stephen D. 2012. *Teaching for Critical Thinking: Tools and Techniques to Help Students Question Their Assumptions.* San Francisco: Jossey-Bass

Brusilovsky, Peter, and Eva Millán. 2007. "User Models for Adaptive Hypermedia and Adaptive Educational Systems." In *The Adaptive Web*, edited by Peter Brusilovsky, Alfred Kobsa, and Wolfgang Nejdl, 3–53. Berlin: Springer.

Capital.com. n.d. "Investmate – Trading Learning App." Accessed December 12, 2024. https://capital.com/trading-learning-app.

Chaffey, D., & Ellis-Chadwick, F. (2019). *Digital Marketing: Strategy, Implementation, and Practice* (7th Edition). Pearson.

Chatterjee, Swarn, and Lu Fan. 2022. "Surviving in Financial Advice Deserts: Limited Access to Financial Advice and Retirement Planning Behavior." *International Journal of Bank Marketing* 40 (1): 50–67. https://doi.org/10.1108/IJBM-12-2020-0590.

Comissão do Mercado de Valores Mobiliários (CMVM). 2023. *CMVM Regulation No. 6/2023: CMVM's Electronic One-Stop Shop (BUE).* Lisbon: CMVM.

Crowley Media Group. 2023. "Safeguarding Data: The Importance of Cybersecurity." Accessed December 05, 2024. https://crowleymediagroup.com/resources/safeguarding-data-the-importance-of-cybersecurity/.

Cummings, B. F., and James, R. N. 2014. "The Role of Financial Planners in Managing Client Investments: Impacts on Portfolio Outcomes and Decision Making." *Journal of Financial Planning* 27 (9): 36–44.

Deloitte. 2023. *2023 Gen Z and Millennial Survey: Financial Stress and Workplace Challenges.* Accessed September 23, 2024. https://www2.deloitte.com/content/dam/Deloitte/global/Documents/deloitte-2023-genz-millennial-survey.pdf.

Digital Skills and Jobs Platform. n.d. "Portugal: National Artificial Intelligence Strategy (AI Portugal 2030)." Accessed December 06, 2024. https://digital-skills-jobs.europa.eu/en/actions/national-initiatives/national-strategies/portugal-national-artificial-intelligence-strategy.

European Banking Authority. 2019. *Thematic Report on the Impact of FinTech on Payment Institutions' and E-Money Institutions' Business Models.* July 2019. https://www.eba.europa.eu/sites/default/files/documents/10180/2551996/32ff1cbb-a6c3-4a01-94f2-4d129386fa0a/EBA%20thematic%20report%20on%20the%20impact%20of%20FinTech%20on%20PIs%27%20and%20EMIs%27%20business%20models.pdf.

European Central Bank. 2016. *Financial Integration in Europe.* Frankfurt am Main: European Central Bank. https://www.ecb.europa.eu/pub/pdf/other/financialintegrationineurope201604.en.pdf.

European Central Bank. 2023. "ECB Conference on Money Markets 2023." November 9-10. Frankfurt am Main. https://www.ecb.europa.eu/press/conferences/html/20231109_money_markets_conference.en.html.

European Commission. 2018. *Distribution Systems of Retail Investment Products Across the European Union.* Brussels: European Commission. https://commission.europa.eu/system/files/2018-04/180425-retail-investment-products-distribution-systems_en.pdf.

European Commission. 2018. *Standard Eurobarometer 89: Europeans and the EU Budget.* Brussels: European Commission. https://publications.europa.eu/resource/cellar/9cacfd6b-9b7d-11e8-a408-01aa75ed71a1.0002.01/DOC_1.

European Commission. 2018. *The 2018 Ageing Report: Economic and Budgetary Projections for the EU Member States (2016–2070).* Institutional Paper 079. Brussels: European

Commission. https://economy-finance.ec.europa.eu/publications/2018-ageing-report-economic-and-budgetary-projections-eu-member-states-2016-2070_en.

European Commission. 2020. *A Capital Markets Union for People and Businesses: New Action Plan.* Brussels: European Commission. https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/capital-markets-union/capital-markets-union-2020-action-plan_en.

European Commission. 2021. *Digital Economy and Society Index (DESI) 2021: Young People and Digital Engagement.* Brussels: European Commission. https://ec.europa.eu/digital-strategy/desi.

European Commission. 2023. "Eurobarometer Survey Reveals Low Levels of Financial Literacy Across the EU." Directorate-General for Financial Stability, Financial Services and Capital Markets Union, July 18, 2023. https://finance.ec.europa.eu/news/eurobarometer-survey-reveals-low-levels-financial-literacy-across-eu-2023-07-18_en.

European Commission. 2023. *Monitoring the Level of Financial Literacy in the EU.* Flash Eurobarometer 525. Brussels: European Commission. https://europa.eu/eurobarometer/surveys/detail/2953.

European Commission. 2023. "Eurobarometer Survey Reveals Low Levels of Financial Literacy Across the EU." Accessed December 09, 2024. https://finance.ec.europa.eu/news/eurobarometer-survey-reveals-low-levels-financial-literacy-across-eu-2023-07-18_en.

European Commission. 2024. "Eurostat News: Digital Inclusion in Rural Areas." Accessed December 5, 2024. https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20241122-1.

European Consumer Debt Network (ECDN). 2020. "COVID-19 Debt: ECDN Press Release." June 2020. https://ecdn.eu/wp-content/uploads/2020/06/COVID-19-Debt-ECDN-Press-Release.pdf.

European Investment Bank. 2019. *Investment Report 2019/2020: Accelerating Europe's Transformation.* Luxembourg: European Investment Bank. https://www.eib.org/en/publications/investment-report-2019.

European Savings and Retail Banking Group (ESBG). 2019. *Financial News & Views, Q2 2019.* Brussels: ESBG. https://www.wsbi-esbg.org/wp-content/uploads/2021/12/newsviews-q2-2019.pdf.

Farman, Jason. 2018. *Delayed Response: The Art of Waiting From the Ancient to the Instant World*. https://www.amazon.com/Delayed-Response-Waiting-Ancient-Instant/dp/0300225679.

FasterCapital. "Token Economy and Gamification: Gamification Trends – The Rise of Token-Based Incentives." Accessed December 03, 2024.

https://fastercapital.com/content/Token-economy-and-gamification--Gamification-Trends--The-Rise-of-Token-Based-Incentives.html.

Female Invest. n.d. "Home." Accessed October 12, 2024. https://www.femaleinvest.com/.

Festinger, Leon. 1954. "A Theory of Social Comparison Processes." *Human Relations* 7 (2): 117–140. https://doi.org/10.1177/001872675400700202.

Finimize. n.d. "Your Daily Financial Briefing." Accessed October 12, 2024. https://www.finimize.com/.

Fox, Jonathan, Suzanne Bartholomae, and Jinkook Lee. 2005. "Building the Case for Financial Education." *Journal of Consumer Affairs* 39 (1): 195–214. https://doi.org/10.1111/j.1745-6606.2005.00009.x.

Guiso, Luigi, and Eliana Viviano. 2015. "How Much Can Financial Literacy Help?" *Review of Finance* 19 (4): 1347–1382. https://doi.org/10.1093/rof/rfu033.

Hamari, Juho, Jonna Koivisto, and Harri Sarsa. 2014. "Does Gamification Work? A Literature Review of Empirical Studies on Gamification." In *Proceedings of the 47th Hawaii International Conference on System Sciences*, 3025–34. IEEE. https://doi.org/10.1109/HICSS.2014.377.

Hamari, Juho, and Jonna Koivisto. 2015. "Why Do People Use Gamification Services?" *International Journal of Information Management* 35 (4): 419–31. https://doi.org/10.1016/j.ijinfomgt.2015.04.006.

Halpern, Diane F. 2013. *Thought and Knowledge: An Introduction to Critical Thinking.* 5th ed. New York: Psychology Press. https://doi.org/10.4324/9780205927580.

Holmes, Wayne, Maya Bialik, and Charles Fadel. 2019. *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning.* Boston: Center for Curriculum Redesign.

Jariwala, H. V., and M. S. Sharma. 2013. "Assessment of Behavioural Outcomes of Financial Education Workshops on Financial Behaviour of the Participants: An Experimental Study." *Journal of Financial Services Marketing* 18 (3): 241–56. https://doi.org/10.1057/fsm.2013.17.

Jonsson, Anders, and Ernesto Panadero. "Facilitating Students' Active Engagement with Feedback." Chapter. In *The Cambridge Handbook of Instructional Feedback*, edited by Anastasiya A. Lipnevich and Jeffrey K. Smith, 531–53. Cambridge Handbooks in Psychology. Cambridge: Cambridge University Press, 2018.

Khan Academy. n.d. "Personal Finance." Accessed October 12, 2024. https://www.khanacademy.org/college-careers-more/personal-finance.

Keller, K. L. (2009). *Building strong brands in a modern marketing communications environment*. *Journal of Marketing Communications*, 15(2-3), 139-155.

Kolb, David A. 1984. *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice-Hall.

Klapper, Leora, Annamaria Lusardi, and Peter van Oudheusden. 2015. Financial Literacy Around the World: Insights from the Standard & Poor's Ratings Services Global Financial Literacy Survey. Washington, DC: Standard & Poor's. https://gflec.org/wp-content/uploads/2015/11/Finlit_paper_16_F2_singles.pdf

Klapper, Leora, Annamaria Lusardi, and Georgios A. Panos. 2012. "Financial Literacy and the Financial Crisis." National Bureau of Economic Research Working Paper No. 17930. https://doi.org/10.3386/w17930.

KPMG International. 2020. Pulse of Fintech H2 2019: Biannual Global Analysis of Investment in Fintech. February 2020. https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2020/02/pulse-of-fintech-h2-2019.pdf

Lee, Jaeung, Melchor C. De Guzman, Jingguo Wang, Manish Gupta, and H. Raghav Rao. 2022. "Investigating Perceptions About Risk of Data Breaches in Financial Institutions: A Routine Activity-approach." *Computers & Security* 121 (July): 102832. https://doi.org/10.1016/j.cose.2022.102832.

Lusardi, Annamaria, and Olivia S. Mitchell. 2011. "Financial Literacy and Retirement Planning in the United States." *Journal of Pension Economics and Finance* 10 (4): 509–25. https://doi.org/10.1017/S147474721100045X.

Lusardi, Annamaria, and Olivia S. Mitchell. 2011. "Financial Literacy Around the World: An Overview." NBER Working Paper No. 17107. Cambridge, MA: National Bureau of Economic Research. https://doi.org/10.3386/w17107.

Mambo. n.d. "Gamification Statistics and Trends." Accessed December 09, 2024. https://mambo.io/gamification-guide/gamification-statistics-and-trends.

McKinsey & Company. 2020. "How COVID-19 Has Pushed Companies Over the Technology Tipping Point—and Transformed Business Forever." October 2020. https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever.

McKinsey & Company. 2024. "Tokenized Financial Assets: From Pilot to Scale." McKinsey & Company. https://www.mckinsey.com/industries/financial-services/our-insights/from-ripples-to-waves-the-transformational-power-of-tokenizing-assets.

Money Matters. *Panel on Financial Education*. YouTube video, February 20, 2024. https://www.youtube.com/watch?v=gPBnN7-i1JE.

MyBnk. n.d. "Our Work: Financial Education Programmes for Young People and Adults." Accessed October 12, 2024. https://www.mybnk.org/our-work/financial-education/.

Neghabi, Ali Akbar, Nima Jafari Navimipour, Mehdi Hosseinzadeh, and Ali Rezaee. 2018. "Load Balancing Mechanisms in the Software Defined Networks: A Systematic and Comprehensive Review of the Literature." *IEEE Access* 6 (January): 14159–78. https://doi.org/10.1109/access.2018.2805842.

OECD. 2024. "Action Needed to Address Gaps in Financial Literacy Among Students." Accessed December 12, 2024. https://www.oecd.org/en/about/news/press-releases/2024/06/Action-needed-to-address-gaps-in-financial-literacy-among-students.html.

OECD. 2020. *OECD/INFE 2020 International Survey of Adult Financial Literacy.* Paris: Organisation for Economic Co-operation and Development. https://doi.org/10.1787/145f5607-en.

OECD. 2020. *OECD Pensions Outlook 2020.* Paris: Organisation for Economic Co-operation and Development. https://doi.org/10.1787/67ede41b-en.

OECD. 2020. *PISA 2018 Results: Are Students Smart About Money?* Paris: Organisation for Economic Co-operation and Development. https://doi.org/10.1787/48ebd1ba-en.

Portugal Digital. n.d. "National Digital Competence Initiative INCoDe.2030." Accessed December 03, 2024. https://portugaldigital.gov.pt/en/national-digital-competence-initiative-incode-2030/.

Prensky, Marc. 2001. "Digital Natives, Digital Immigrants." *On the Horizon* 9 (5): 1–6. https://doi.org/10.1108/10748120110424816.

PwC. 2024. "Value from Tokenization in Financial Services." PwC. https://www.pwc.com/us/en/tech-effect/emerging-tech/tokenization-in-financial-services.html.

Soori, Mohsen, Fooad Karimi Ghaleh Jough, Roza Dastres, and Behrooz Arezoo. 2024. "AI-Based Decision Support Systems in Industry 4.0: A Review." *Journal of Economy and Technology*. https://doi.org/10.1016/j.ject.2024.08.005.

Statista. 2023. "Mobile Network Coverage Worldwide by Region - Urban and Rural." Accessed December 03, 2024. https://www.statista.com/statistics/1228855/mobile-network-coverage-worldwide-by-region-urban-rural/.

StartUs Insights. n.d. "EdTech Industry Report: Innovators' Guide to Education Technology." Accessed December 04, 2024. https://www.startus-insights.com/innovators-guide/edtech-industry-report/.

"The Tenets of A/B Testing from Duolingo's Master Growth Hacker." n.d. *First Round Review*. Accessed December 12, 2024. https://review.firstround.com/the-tenets-of-a-b-testing-from-duolingos-master-growth-hacker/.

Van Rooij, Maarten C. J., Annamaria Lusardi, and Rob J. M. Alessie. 2011. "Financial Literacy and Retirement Preparation in the Netherlands." *Journal of Economic Psychology* 32 (4): 593–608. https://doi.org/10.1016/j.joep.2011.02.004.

Wifitalents. 2024. "Robinhood User Statistics: App Downloads Surge as Trades Skyrocket." Accessed December 05, 2024. https://wifitalents.com/statistic/robinhood-user/.

10 Appendix

Table of Contents

Table 1: Abbreviation

Abbreviation	Explanation
AI	Artificial Intelligence
ATU	Attitude Towards Using
BI	Behavioral Intention
CAGR	Compound Annual Growth Rate
CMVM	Comissão do Mercado de Valores Mobiliários (Portugal's Securities Market Commission)
DeFi	Decentralized Finance
ECB	European Central Bank
EC	European Commission
ESBG	European Savings and Retail Banking Group
EU	European Union
ETL	Experimental Learning Theory
FinTech	Financial Technology
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
KPI	Key Performance Indicators
MVP	Minimal Viable Product
OECD	Organisation for Economic Co-operation and Development
PEOU	Perceived Ease of Use
PISA	Programme for International Student Assessment
PPT	Peer Performance Tracking
PU	Perceived Usefulness
SD	Standard Deviation
SDG	Sustainability Development Goals
SDT	Self Determination Theory
TAM	Technology Acceptance Model

Table 2: Direct and Indirect Competitors and YARA's Differentiators

Category	Competitors	Key activity and differntiators
Direct Competitors	Female Invest	Provides financial education for women, including investment guides, webinars, and online courses.Offers personalized, accessible financial education with community-driven learning (Female Invest, n.d.).
		YARA combines gamification, simulations, and behavioral insights, while Female Invest focuses on gender-specific content.
	eToro Academy	Financial education integrated into their trading platform. Educates users about investment strategies and offers hands-on learning via demo trading accounts (eToro, n.d.).

		YARA focuses exclusively on unbiased education without promoting specific trading platforms or financial products.
	Finimize	Bite-sized financial and investment insights for busy professionals. Provides accessible financial literacy content (Finimize, n.d.).
		YARA emphasizes long-term learning journeys, confidence-building, and interactive features, rather than static informational updates.
	MyBnk	Financial education programs targeted at young people. Educates young adults but lacks digital gamification, simulations, or personalized features (MyBnk, n.d.).
		YARA's technology-driven, mobile-first approach makes it more scalable and engaging.
	Zogo Finance	Gamified financial literacy app offering bite-sized lessons and rewards. Gamification and financial literacy overlap directly with YARA. While Zogo Finance excels in gamified financial education, it is heavily focused on short, quiz-based learning modules and rewards for engagement (e.g., earning gift cards for completing lessons) (Zogo, n.d.).
		YARA, on the other hand goes beyond gamification, builds community, addresses confidence and psychological barriers**,** as well as its focus on the European market**,** where Zogo is not widely available.
	Investmate	Offers gamified quizzes and lessons but lacks adaptive learning systems and a specialized focus on investment education (mainly trading) (Capital.com, n.d.).
		YARA differentiates itself by combining simulations with gamification tailored to individual user progress, from very basic concepts to more complex ones.
Indirect Competitors	Banks & other Investment Consultation Services	Offer financial advice and investment planning, often through in-person consultations. Help individuals plan their finances and make informed investment decisions (Cummings & James, 2014).
		YARA democratizes financial knowledge through self-paced learning and empowers users to make decisions independently, without requiring a financial advisor.
	Financial Literacy Classes (Universities or Public Programs, Non-Profit Organizations)	Provide in-person or online courses on financial literacy, or NGOs offer free resources and workshops. They aim to educate individuals about managing finances and investments. (University of Illinois Urbana-Champaign, n.d.).
		YARA offers a mobile, interactive, and gamified solution, accessible anytime and personalized to individual needs, that meets the needs of digital natives.
	Online Classes (e.g. Udemy,	On-demand video courses on personal finance and investing. Educates users on similar topics, often with

	Skillshare or Khan Acedemy)	a wide range of instructors (Khan Academy, n.d., Udemy, n.d.).
		YARA's adaptive learning and interactive tools go beyond static, one-size-fits-all course formats.
	Robo-Advisors (e.g., Wealthsimple, Nutmeg)	Automate investment strategies and simplify the process for users. Help users with investment decision-making but don't focus on financial education (Wealthsimple, n.d., Nutmeg, n.d.).
		YARA educates users, building their confidence and equipping them with the knowledge to manage finances independently.
	Trading Platforms (e.g. Robinhood)	Provide easy access to stock trading and investment tools. Attract young users with simple interfaces and financial tools (Wifitalents, 2024).
		YARA focuses on education and empowerment, not directly trading.

Table 3: SWOT Analysis

Strengths	**Weaknesses**
- Holistic approach through integrating gamification, personalization, community-driven features, and personalized learning. - Focus on psychological barriers and confidence building - Highly personalized and adaptable learning paths backed by AI/machine learning systems	- Limited brand recognition as a new platform - Requires high initial investment especially in technology infrastructure
Opportunities	**Threats**
- Growing demand for financial education among young adults - Rising acceptance of gamification and interactive learning, with a growing gamification market; $30.7 billion by 2025, reflecting a compound annual growth rate of 27.4% (Mambo, n.d.) - Favorable policy trends supporting financial literacy efforts	- Established competitors with strong user base - Already established infrastructure of value proposition (e.g. Duolingo) that could quickly adapt to financial education - Rapid technological advancement may increase competition - Market saturation in Fintech and educational platforms (StartUs Insights, n.d.)

Table 4: PESTEL Analysis

Factor	Description
Political	- The European Commission's "Capital Markets Union" action plan emphasizes the importance of improving financial literacy to empower citizens and foster economic resilience (European Commission, 2020). This creates a favorable political environment for platforms like YARA that aim to increase financial literacy. - Governments across Europe, particularly in regions like Portugal, provide funding and incentives for educational innovation, including gamified tools (Digital Skills and Jobs Platform, n.d.; Portugal Digital, n.d.)
Economic	- Economic instability and high inflation rates in Europe have heightened public awareness of the need for financial literacy. Younger generations are actively seeking tools to manage their finances amid uncertain economic conditions (Deloitte, 2023). - Traditional financial education options, such as in-person workshops or consulting services, are often expensive and inaccessible to many (Jariwala & Sharma, 2013). YARA's cost-effective model fills this gap, making financial education more widely available. - The global EdTech industry, particularly gamification in education, is growing rapidly, creating opportunities for YARA to leverage market momentum (Technavio, 2024).
Social	- Young adults in Europe often lack basic financial knowledge, especially in Southern regions (European Commission, 2023; OECD, 2024) - In Southern Europe, there is a cultural hesitation around discussing personal finance, making YARA's gamified and community-driven approach appealing and less intimidating (UNSDG, 2022) - Digital natives are accustomed to mobile-first solutions, making YARA's app-based delivery highly relevant to its target audience
Technological	- The rise of gamification technologies allows platforms like YARA to create engaging and effective learning experiences. Tools such as adaptive learning algorithms and AI-driven personalization are key differentiators. - Widespread smartphone adoption and improved internet connectivity, even in rural areas, enhance YARA's ability to reach its target demographic (Statista, 2023.; European Commission, 2024). - With increasing reliance on technology comes the need for robust cybersecurity measures to protect user data and maintain trust (Crowley Media Group, 2023).
Environmental	- YARA's app-based platform aligns with global sustainability efforts by reducing the need for physical materials, such as textbooks and printed resources.

	- The digital nature of YARA's platform allows for remote access, reducing the environmental footprint.
Legal	- YARA must adhere to strict GDPR requirements for data collection, storage, and usage, especially given its reliance on personalized learning paths and behavioral insights. - Gaining certifications or endorsements from educational bodies can enhance YARA's credibility and appeal to institutional partners. - As a financial education platform, YARA must include clear disclaimers to avoid liability for financial advice or outcomes. - It is not clear to what extend it is possible to provide AI-driven content regarding investment strategies, due to current lack of regulations

Table 5: Keywords Used for Literature Review

Chapter	**Keywords Used for Literature Review**
- Opportunity Identification - Yara as a Solution	Financial literacy, financial literacy in Europe, financial literacy's effects, retirement planning, investing, financial insecurity young adults Europe, financial stress, retirement fears, financial market participation, financial literacy Portugal, pension systems Europe, European Commission old-age dependency ratio, retirement savings trends, financial literacy's economic implications, barriers financial market, financial apps preferences, digital financial education, gamification, personalized learning, digital natives, Fintech platforms, AI in education, FinTech, Fintech growth, learning preferences
Effectiveness of Solution	Gamification, Gamification Effectiveness, Kahoot!, Duolingo, EdTech, e-learning, Simulated Learnings, Personalization in Apps, Motivation in Learning, Motivated Learning, Intrinsic motivation, Experiential Learning, Social Learning, Collaborative Learning, Learning Engagement, Self-Efficacy, Feedback, self-regulated learning, Financial Education, Financial Literacy, Financial Behavior, Financial Well-Being, Stock-Market Participation, Investment Behavior, educational feedback mechanisms
Feasibility of Solution	Gamification in education, Off-the-shelf software vs. custom-built platforms, System architecture for gamification apps, Scalability of gamified platforms, Adaptive learning algorithms, Data ownership and GDPR compliance, Cloud computing for gamified platforms, AWS for educational platforms, Cost analysis of gamification infrastructure, Gamification market size and growth, Personalization in online education, Duolingo gamification strategy, Community-driven engagement features, Competitive analysis of investment education apps, CMVM requirements, Legal disclaimers for financial education platforms, Cost-benefit analysis of custom vs. off-the-shelf systems, Infrastructure setup costs for gamified platforms, Long-term scalability of gamified systems, funding for gamified educationapp, Blockchain in education technology, DeFi education, Adoption of blockchain in fintech education

Table 6: Financial Literacy Survey Questions

No.	Question	Answer Options	Correct Answer
1	Imagine that 5 brothers are gifted 1000€. They have to wait for one year to get their share. In one year's time will they be able to buy:	(a) More (b) The same amount (c) Less than they could buy today	c) Less than they could buy today
2	Suppose you put 100€ into a savings account with a guaranteed interest rate of 2% per year. How much would be in the account at the end of the first year?	Open field for whole number entry	102€
3	Suppose you put 100€ into a savings account with a guaranteed interest rate of 2% per year. After five years, how much would be in the account?	(a) More than 110€ (b) Exactly 110€ (c) Less than 110€ (d) Impossible to tell	(a) More than 110€
4	It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares.	(a) True (b) False	(a) True
5	An investment with a high return is likely to be high risk.	(a) True (b) False	(a) True
6	Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?	(a) More than today (b) Exactly the same (c) Less than today (d) Do not know	(c) Less than today
7	Buying a single company's stock usually provides a safer return than a stock mutual fund.	(a) True (b) False	(b) False
8	You lend X to a friend one evening and he gives you X back the next day. How much interest has he paid on this loan?	Open field for whole number entry	0€

Table 7: Simulation Scenarios and Skill Development

Financial Scenarios	Explanation	Skills Development	Explanation
Asset Allocation, Diversification	Users learn the importance of diversifying investments across asset classes such as stocks, bonds, and commodities to minimize risk and optimize returns.	Critical Thinking	Participants assess the implications of various market events and their impact on portfolio performance. Halpern (2013) labels critical thinking in decision-making, particularly in contexts requiring the assessment of complex variables, such as financial markets. Through simulated environments learners can practice assessing the implications of

			different scenarios (Brookfield, S. D. (2012).
Market Volatility	Through simulated market fluctuations, users gain experience in navigating changes driven by factors such as inflation, interest rate shifts, and geopolitical events.	Adaptability	Exposure to dynamic scenarios fosters flexibility, enabling users to anticipate and respond effectively to changing market conditions. Based on experimental learning theory (Kolb, D. A. (1984).
Risk-Reward Trade-Offs	Users evaluate the outcomes of high-risk, high-reward strategies versus conservative approaches, enhancing their ability to weigh trade-offs and make informed, data-driven decisions.	Strategic Planning	Users practice aligning investment strategies with specific financial goals and risk tolerance levels. Based on Shapira, Z. (1995), who discusses the role of risk tolerance and goal alignment in strategic planning, providing insights into how individuals can practice these skills in controlled settings like simulations.

Explanation1: In-Depth Explanation of Revenue Streams

YARA operates on a freemium model, allowing users to access essential features for free while offering premium upgrades for those seeking an enhanced learning experience, to truly democratize financial market participation.

The free tier provides access to vital financial education tools, including core lessons, quizzes, and basic investment simulations. It integrates gamified elements such as points, badges, and simple challenges to engage users. Basic personalization is also available, with dynamically adapting learning paths tailored to individual goals. Additionally, users can access limited peer benchmarking through aggregated, anonymous data, fostering inclusivity and motivation. For users seeking a more comprehensive experience, YARA offers a subscription-based premium tier. Features include detailed analytics on user performance, in-depth feedback, and advanced peer performance tracking with customizable settings. Premium users also gain access to enhanced gamified features, such as additional "lives," enabling longer and more intensive learning sessions. Flexible subscription plans, including monthly, annual, and lifetime options, cater to diverse user needs and budgets.

To support the free tier, YARA incorporates non-intrusive advertising opportunities to ensure user engagement and trust. For instance, financial service providers such as investment platforms or insurance companies could sponsor educational content or gamified challenges. Sponsored simulations could allow users to learn about real-world financial tools while engaging with a sponsoring organization's offerings. Additionally, affiliate partnerships with fintech apps, budgeting tools, or brokerage platforms might allow YARA to earn commissions when users engage with these services through the app.

YARA further envisions to partner with institutional organizations like universities and NGOs as a potential future revenue stream to expand its reach and to tap into the B2B market. These partnerships could generate revenue through licensing agreements and white-label solutions. Licensing agreements would allow institutions to purchase access to YARA's platform for their students or employees, offering customized financial education experiences. Similarly, white-label solutions would create branded versions of YARA tailored to the specific needs of institutional clients.While these approaches hold potential as future revenue streams, the primary focus at this early stage should remain on building a critical mass of individual users. By prioritizing customer acquisition and engagement, YARA can establish credibility, refine its platform, and demonstrate its value proposition before pursuing more resource-intensive monetization strategies.

Explanation 2: In-Depth Explanation of Main Costs of YARA

The platform requires ongoing investment in development and maintenance to ensure it remains technologically advanced and secure. AI and machine learning play a crucial role in enabling personalized and adaptive learning, necessitating regular updates. Additionally, creating high-quality financial education modules and gamified challenges demands investment in content development. Marketing campaigns target digital natives through social

media, search engines, and partnerships with influencers, while outreach to universities and corporate partners ensures continued institutional adoption. Customer support and community management are also essential components that must be accounted for.

A strong focus on research and development ensures that YARA remains at the forefront of financial education technology. User feedback, emerging educational trends, and advancements in digital tools are continuously incorporated to refine the platform's offerings.

YARA : Exploring User Behavior and Engagement Preferences

Dear Respondents,

We are two master's students at **Nova School of Business and Economics**, specializing in **Entrepreneurship and Impact Entrepreneurship**, conducting a study as part of our thesis. Our research focuses on understanding how individuals engage with financial literacy tools and educational app features, particularly in the context of empowering young people to make confident investment decisions.

The insights gathered from this survey will contribute to the development of **YARA**, an app designed to help users achieve financial independence by building investment knowledge and skills through engaging and personalized learning experiences.

This survey will explore your financial literacy, learning preferences, and thoughts on specific features, such as tracking peer progress. Your responses will help us better understand user needs and preferences, enabling us to design a platform that truly empowers individuals in their financial journeys.

The survey will take approximately **6-8 minutes** to complete, and all responses will remain completely **anonymous and confidential**. Your feedback is critical to shaping this project and ensuring its positive impact.
Thank you for your time and valuable input! If you have any questions or need assistance, feel free to reach out.

Sincerely,
Anouk & Lisa

Contact information: Lisa: 59953@novasbe.pt & Anouk: 59815@novasbe.pt

* Required

Section 1 - Demographics

1. How old are you? *

- ◯ Under 18
- ◯ 18-25
- ◯ 26-30
- ◯ 31-40
- ◯ over 40

2. Where are you from? *

- ◯ Western Europe (e.g., Germany, France, UK, Netherlands, Belgium, Switzerland, Austria, Luxembourg)
- ◯ Northern Europe (e.g., Sweden, Denmark, Norway, Finland, Iceland, Estonia, Latvia, Lithuania)
- ◯ Southern Europe (e.g., Italy, Spain, Portugal, Greece, Croatia, Malta, Cyprus)
- ◯ Eastern Europe (e.g., Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Ukraine)
- ◯ Southeastern Europe (Balkans) (e.g., Serbia, Albania, Bosnia and Herzegovina, North Macedonia, Montenegro)
- ◯ Other

Perceived Financial Literacy

3. How financially literate do **you** believe you are? *

1 = Not at all literate
7 = Extremely literate

1	2	3	4	5	6	7

4. How financially literate do you believe **your peers** are? *

1 = Not at all literate
7 = Extremely literate

1	2	3	4	5	6	7

Section 2 - Financial Literacy Evaluation

Please answer the following questions

5. Imagine that **5 brothers** are gifted **1000€**. They have to wait for **one year** to get their share. In **one year's time** will they be able to buy: *

- ◯ More
- ◯ The same amount
- ◯ Less than they could buy today

6. Suppose you put **100€** into a savings account with a guaranteed **interest rate of 2% per year**. You don't make any further payments into this account and you don't withdraw any money. **How much** would be in the account at the **end of the first year,** once the interest payment is made? *

Please enter a whole number

7. Suppose you put **100 €** into a savings account with a guaranteed **interest rate of 2%** per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account **at the end of five years?** Would it be: *

- ◯ More than 110 €
- ◯ Exactly 110 €
- ◯ Less than 110 €
- ◯ Or is it impossible to tell from the information given

8. It is usually possible to **reduce** the **risk** of investing in the stock market **by buying a wide range** of stocks and shares? *

- ◯ True
- ◯ False

9. An investment with a **high return** is likely to be **high risk**. *

- ◯ True
- ◯ False

10. Imagine that the **interest rate** on your savings account was **1%** per year and **inflation** was **2%** per year. **After 1 year,** how much would you be able to buy with the money in this account? *

- ◯ More than today
- ◯ Exactly the same
- ◯ Less than today
- ◯ Do not know

11. Buying a **single company's stock** usually provides a safer return than a **stock mutual fund** *

- ◯ True
- ◯ False

12. You lend X to a friend one evening and he gives you X back the next day. **How much interest** has he **paid** on this loan? *

Please enter a whole number

Approach to Learning

13. Which of the following **best** describes your **approach** to **learning**? *

- ◯ I prefer trying things out and learning by doing
- ◯ I prefer thinking deeply and observing before taking action
- ◯ I prefer learning from structured models or theories
- ◯ I prefer exploring new experiences and adapting to challenges

14. What **motivates** you most when learning something new? *

- ◯ Achieving personal goals or mastery of a skill
- ◯ Earning rewards or recognition
- ◯ Collaborating or connecting with others during learning
- ◯ Feeling competent and able to apply what I've learned quickly

Peer Performance Tracking

*Peer performance tracking allows you to see how **others** using the app are **progressing** in their **financial learning or goals**. It might include features like **viewing milestones, achievements, or progress comparisons** to help motivate and guide your own journey.*

15. **Perceived Usefulness** *

*Please indicate the extent to which you agree with the following statements about the **potential usefulness of peer progress tracking** in the app.*

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Seeing that my peers are progressing in the app would encourage me to stay consistent in my financial learning.	◯	◯	◯	◯	◯	◯	◯
Peer progress tracking would enhance my motivation to achieve financial literacy goals.	◯	◯	◯	◯	◯	◯	◯
Knowing how my peers are performing would help me benchmark my own progress.	◯	◯	◯	◯	◯	◯	◯
Peer progress tracking would make the app more engaging and effective for learning about investments.	◯	◯	◯	◯	◯	◯	◯
I find peer progress tracking useful for motivating consistent engagement with the app.	◯	◯	◯	◯	◯	◯	◯

16. **Attitude Toward Using** *

*Please indicate the extent to which you agree with the following statements about your **attitude toward the potential inclusion of peer progress tracking** in the app.*

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Peer progress tracking in the app is a good idea.	◯	◯	◯	◯	◯	◯	◯
I feel positive about seeing how my peers are progressing in the app.	◯	◯	◯	◯	◯	◯	◯
I would enjoy using peer progress features to stay motivated in the app.	◯	◯	◯	◯	◯	◯	◯
Peer progress tracking would make the app more engaging and enjoyable to use.	◯	◯	◯	◯	◯	◯	◯

17. **Behavioral Intention to Use** *

*Please indicate the extent to which you agree with the following statements about **your intention to use peer progress tracking** if it is included in the app.*

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I intend to use the app's peer progress tracking features to stay motivated.	◯	◯	◯	◯	◯	◯	◯
I predict that I will regularly use peer progress tracking to monitor my learning and engagement.	◯	◯	◯	◯	◯	◯	◯
I plan to rely on peer progress tracking to benchmark my performance and motivate myself to improve.	◯	◯	◯	◯	◯	◯	◯
I am committed to using peer progress tracking to achieve my financial literacy goals.	◯	◯	◯	◯	◯	◯	◯

18. How comfortable would you feel receiving AI-based investment advice? *

- ◯ Very comfortable
- ◯ Somewhat comfortable
- ◯ Neutral
- ◯ Somewhat uncomfortable
- ◯ Very uncomfortable

19. **Feature Preferences** *

*Please indicate the extent to which you agree with the following statements about **how peer progress tracking should work** in a financial literacy app.*

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I would prefer peer progress tracking to show individual performance in a way that feels non-competitive.	◯	◯	◯	◯	◯	◯	◯
Peer tracking should highlight specific milestones or achievements my peers have reached.	◯	◯	◯	◯	◯	◯	◯
It would be helpful if I could compare my progress anonymously with others (e.g., using aggregate data instead of names).	◯	◯	◯	◯	◯	◯	◯
I would prefer the ability to customize whose progress I see (e.g., friends or peers with similar goals).	◯	◯	◯	◯	◯	◯	◯

Quantitative Survey Analysis: Statistical Procedures and Outcomes

Table of contents

1. Descriptive Statistics

1.1 Actual Financial Literacy

Clustered by age group

Descriptives

AGE			Statistic	Std. Error
Total Financial Literacy Score	18-25	Mean	7.3049	0.13180
		95% Confidence Interval for Mean — Lower Bound	7.0436	
		95% Confidence Interval for Mean — Upper Bound	7.5671	
		5% Trimmed Mean	7.4756	
		Median	8.0000	
		Variance	1.424	
		Std. Deviation	1.19349	
		Minimum	1.00	
		Maximum	8.00	
		Range	7.00	
		Interquartile Range	1.00	
		Skewness	-2.671	0.266
		Kurtosis	9.569	0.526
	26-30	Mean	7.0000	0.33333
		95% Confidence Interval for Mean — Lower Bound	6.2997	
		95% Confidence Interval for Mean — Upper Bound	7.7003	
		5% Trimmed Mean	7.1111	
		Median	8.0000	
		Variance	2.111	
		Std. Deviation	1.45297	
		Minimum	4.00	
		Maximum	8.00	
		Range	4.00	
		Interquartile Range	1.00	
		Skewness	-1.457	0.524
		Kurtosis	0.850	1.014
	31-40	Mean	7.5000	0.50000
		95% Confidence Interval for Mean — Lower Bound	1.1469	
		95% Confidence Interval for Mean — Upper Bound	13.8531	
		5% Trimmed Mean		
		Median	7.5000	
		Variance	0.500	
		Std. Deviation	0.70711	
		Minimum	7.00	
		Maximum	8.00	
		Range	1.00	
		Interquartile Range		
		Skewness		
		Kurtosis		
	over 40	Mean	7.6000	0.24495
		95% Confidence Interval for Mean — Lower Bound	6.9199	
		95% Confidence Interval for Mean — Upper Bound	8.2801	
		5% Trimmed Mean	7.6111	
		Median	8.0000	
		Variance	0.300	
		Std. Deviation	0.54772	
		Minimum	7.00	
		Maximum	8.00	
		Range	1.00	
		Interquartile Range	1.00	
		Skewness	-0.609	0.913
		Kurtosis	-3.333	2.000
	Under 18	Mean	4.5000	3.50000
		95% Confidence Interval for Mean — Lower Bound	-39.9717	
		95% Confidence Interval for Mean — Upper Bound	48.9717	
		5% Trimmed Mean		
		Median	4.5000	
		Variance	24.500	
		Std. Deviation	4.94975	
		Minimum	1.00	
		Maximum	8.00	
		Range	7.00	
		Interquartile Range		
		Skewness		
		Kurtosis		

Clustered by location

Descriptives

Location			Statistic	Std. Error
Total Financial Literacy Score	Eastern	Mean	7.5000	0.50000
		95% Confidence Interval for Mean — Lower Bound	5.9088	
		95% Confidence Interval for Mean — Upper Bound	9.0912	
		5% Trimmed Mean	7.5556	
		Median	8.0000	
		Variance	1.000	
		Std. Deviation	1.00000	
		Minimum	6.00	
		Maximum	8.00	
		Range	2.00	
		Interquartile Range	1.50	
		Skewness	-2.000	1.014
		Kurtosis	4.000	2.619
	Northern	Mean	6.7500	0.94648
		95% Confidence Interval for Mean — Lower Bound	3.7379	
		95% Confidence Interval for Mean — Upper Bound	9.7621	
		5% Trimmed Mean	6.8333	
		Median	7.5000	
		Variance	3.583	
		Std. Deviation	1.89287	
		Minimum	4.00	
		Maximum	8.00	
		Range	4.00	
		Interquartile Range	3.25	
		Skewness	-1.659	1.014
		Kurtosis	2.615	2.619
	Southern	Mean	6.8966	0.30329
		95% Confidence Interval for Mean — Lower Bound	6.2753	
		95% Confidence Interval for Mean — Upper Bound	7.5178	
		5% Trimmed Mean	7.1111	
		Median	7.0000	
		Variance	2.667	
		Std. Deviation	1.63324	
		Minimum	1.00	
		Maximum	8.00	
		Range	7.00	
		Interquartile Range	1.50	
		Skewness	-2.147	0.434
		Kurtosis	5.267	0.845
	Western	Mean	7.3562	0.13981
		95% Confidence Interval for Mean — Lower Bound	7.0775	
		95% Confidence Interval for Mean — Upper Bound	7.6349	
		5% Trimmed Mean	7.5426	
		Median	8.0000	
		Variance	1.427	
		Std. Deviation	1.19455	
		Minimum	1.00	
		Maximum	8.00	
		Range	7.00	
		Interquartile Range	1.00	
		Skewness	-2.991	0.281
		Kurtosis	11.472	0.558

1.2 Perceived Financial Literacy Scores

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived financially literacy	110	1	7	4.16	1.392
Actual Financial Literacy Score	110	1.00	8.00	7.2182	1.34357
Valid N (listwise)	110				

1.3 Confidence categories

Positive values indicate **overconfidence** (perceived > actual), negative values indicate **underconfidence** (perceived < actual), and zero indicates alignment between perception and reality.

Confidence categories were created (underconfident, aligned, overconfident) to summarize gaps between perceived and actual financial literacy.

2. Comparative Analyses

2.1 Perceived Financial Literacy vs Actual Financial Literacy

2.1.1 Paired Samples T-Test

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Perceived financially literacy	4.16	110	1.392	.133
	Actual Financial Literacy Score	7.2182	110	1.34357	.12810

Paired Samples Correlations

		N	Correlation	Significance One-Sided p	Significance Two-Sided p
Pair 1	Perceived financially literacy & Actual Financial Literacy Score	110	.354	<.001	<.001

Paired Samples Test

		Paired Differences					t	df	Significance One-Sided p	Significance Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper				
Pair 1	Perceived financially literacy – Actual Financial Literacy Score	-3.05455	1.55532	.14829	-3.34846	-2.76063	-20.598	109	<.001	<.001

Paired Samples Effect Sizes

			Standardizer[a]	Point Estimate	95% Confidence Interval Lower	Upper
Pair 1	Perceived financially literacy – Actual Financial Literacy Score	Cohen's d	1.555	-1.964	-2.283	-1.642
		Hedges' correction	1.566	-1.950	-2.267	-1.630

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation of the mean difference.
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

T-Test Interpretation

The t-value of -20.598 ($p < 0.001$) indicates that this difference is statistically significant, meaning the observed gap is unlikely to have occurred by chance. The results strongly highlight a widespread underestimation of financial literacy among respondents, pointing to a systemic issue of underconfidence. The Cohen's d of 1.555 represents a large effect size, demonstrating that the difference between perceived and actual financial literacy is not only statistically significant but also practically meaningful.

Frequencies

Statistics

ConfidenceCategory

N	Valid	110
	Missing	0

ConfidenceCategory

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	102	92.7	92.7	92.7
	2.00	5	4.5	4.5	97.3
	3.00	3	2.7	2.7	100.0
	Total	110	100.0	100.0	

1 = **underconfident**, 2 = **aligned**, and 3 = **overconfident**.

2.2 Perceived Financial Literacy vs Perceived Peer Financial Literacy

2.2.1 Paired Samples T-Test

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Perceived financially literacy	4.16	110	1.392	.133
	Perceived peer financially literacy	4.02	110	1.234	.118

Paired Samples Correlations

		N	Correlation	Significance One-Sided p	Significance Two-Sided p
Pair 1	Perceived financially literacy & Perceived peer financially literacy	110	.169	.039	.077

Paired Samples Test

		Paired Differences					t	df	Significance One-Sided p	Significance Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper				
Pair 1	Perceived financially literacy – Perceived peer financially literacy	.145	1.696	.162	-.175	.466	.899	109	.185	.370

Paired Samples Effect Sizes

			Standardizer[a]	Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Pair 1	Perceived financially literacy – Perceived peer financially literacy	Cohen's d	1.696	.086	-.102	.273
		Hedges' correction	1.708	.085	-.101	.271

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation of the mean difference.
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

3. TAM (Technology Acceptance Model) Analysis

Technology Acceptance Model constructs: Perceived Usefulness (**PU**), Attitude Toward Use (**ATU**), and Behavioral Intention (**BI**)

3.1 Descriptives Statistics

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PU_Score	110	3.00	7.00	5.3036	1.04985
ATU_Score	110	2.00	7.00	5.2841	1.23150
BI_Score	110	1.25	7.00	4.8386	1.33693
Valid N (listwise)	110				

3.2 Construct Reliability

Reliability testing was conducted to assess the internal consistency of the survey items for each TAM construct: Perceived Usefulness (PU), Attitude Toward Usage (ATU), and Behavioral Intention (BI).

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	110	100.0
	Excluded[a]	0	.0
	Total	110	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.868	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PU Question 1	21.11	18.795	.647	.850
PU Question 2	21.38	16.697	.764	.821
PU Question 3	20.96	20.035	.560	.870
PU Question 4	21.27	17.888	.766	.822
PU Question 5	21.35	17.678	.723	.832

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	110	100.0
	Excluded[a]	0	.0
	Total	110	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.938	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ATU Question 1	15.75	14.224	.833	.925
ATU Question 2	15.88	13.646	.863	.916
ATU Question 3	15.92	13.764	.860	.917
ATU Question 4	15.85	14.089	.856	.918

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	110	100.0
	Excluded[a]	0	.0
	Total	110	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.927	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
BI Question 1	14.28	17.379	.799	.914
BI Question 2	14.48	16.234	.875	.889
BI Question 3	14.61	15.690	.873	.889
BI Question 4	14.69	16.619	.774	.923

All three constructs demonstrated high reliability. These results confirm that the survey items for each construct were well-designed and suitable for further statistical analyses, such as regression or correlation testing. Which we did afterwards.

3.3 Correlation analysis

Correlations

Correlations

		PU_Score	ATU_Score	BI_Score
PU_Score	Pearson Correlation	1	.785**	.786**
	Sig. (2-tailed)		<.001	<.001
	N	110	110	110
ATU_Score	Pearson Correlation	.785**	1	.776**
	Sig. (2-tailed)	<.001		<.001
	N	110	110	110
BI_Score	Pearson Correlation	.786**	.776**	1
	Sig. (2-tailed)	<.001	<.001	
	N	110	110	110

**. Correlation is significant at the 0.01 level (2-tailed).

All correlations are significant at the **0.01 level**. There is a **strong, positive relationship** among all three constructs (PU, ATU, and BI). It confirms the expected theoretical relationships between the constructs in TAM and sets the stage for further regression analysis to determine causality and predictive power.

3.4 Regression analysis

A linear regression analysis was conducted to test the relationships between the TAM constructs:

1. Model 1: Assess the influence of Perceived Usefulness (PU) on Attitude Toward Usage (ATU).
2. Model 2: Evaluate how both PU and ATU predict Behavioral Intention (BI).

Independent and Dependent Variables:

- **Model 1:** PUScore (Independent Variable) → ATUScore (Dependent Variable)
- **Model 2:** PUScore and ATUScore (Independent Variables) → BIScore (Dependent Variable)

Evaluation Metrics: R-Squared (R^2): Proportion of variance in the dependent variable explained by the independent variable(s). **Standardized Beta Coefficients (β):** Strength and direction of the relationships. **Significance (p-values):** Indicates whether the relationships are statistically significant.

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	PU_Score[b]	.	Enter

a. Dependent Variable: ATU_Score

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.785[a]	.617	.613	.76605

a. Predictors: (Constant), PU_Score

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	101.932	1	101.932	173.698	<.001[b]
	Residual	63.378	108	.587		
	Total	165.310	109			

a. Dependent Variable: ATU_Score

b. Predictors: (Constant), PU_Score

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.399	.378		1.056	.293
	PU_Score	.921	.070	.785	13.179	<.001

a. Dependent Variable: ATU_Score

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	ATU_Score, PU_Score[b]	.	Enter

a. Dependent Variable: BI_Score

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.827[a]	.684	.678	.75859

a. Predictors: (Constant), ATU_Score, PU_Score

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	133.250	2	66.625	115.778	<.001[b]
	Residual	61.574	107	.575		
	Total	194.823	109			

a. Dependent Variable: BI_Score

b. Predictors: (Constant), ATU_Score, PU_Score

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.651	.376		-1.731	.086
	PU_Score	.587	.112	.461	5.253	<.001
	ATU_Score	.450	.095	.414	4.718	<.001

a. Dependent Variable: BI_Score

$R^2 = 0.684$: PU and ATU collectively explain 68.4% of the variance in BI.

$F(2, 107) = 115.778$, $p < 0.001$: The model is statistically significant ($F(2, 107) = 115.778$, $p < 0.001$), meaning the combined effect of PU and ATU on BI is not due to chance.

PU ($\beta = 0.461$, $p < 0.001$): PU is the slightly stronger predictor of BI, indicating that participants' perception of the system's usefulness is a key driver of their intention to use it. This suggests that utility outweighs emotional appeal, though both are critical.

ATU ($\beta = 0.414$, $p < 0.001$): ATU also significantly predicts BI, highlighting the importance of positive attitudes toward the system.

3.5 TAM and Demographics analysis

3.5.1 Correlations

Correlations

Correlations

		PU_Score	ATU_Score	BI_Score	Categorical Age Groups (1=Under 18, 2=18-25, 3=26-30, 4=31-40, 5=over 40)
PU_Score	Pearson Correlation	1	.785**	.786**	-.080
	Sig. (2-tailed)		<.001	<.001	.405
	N	110	110	110	110
ATU_Score	Pearson Correlation	.785**	1	.776**	-.015
	Sig. (2-tailed)	<.001		<.001	.880
	N	110	110	110	110
BI_Score	Pearson Correlation	.786**	.776**	1	-.056
	Sig. (2-tailed)	<.001	<.001		.560
	N	110	110	110	110
Categorical Age Groups (1=Under 18, 2=18-25, 3=26-30, 4=31-40, 5=over 40)	Pearson Correlation	-.080	-.015	-.056	1
	Sig. (2-tailed)	.405	.880	.560	
	N	110	110	110	110

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson Correlations between age and PU, ATU, or BI scores are all very small (ranging from -0.080 to -0.056), and the associated p-values (e.g., 0.405, 0.880, 0.560) indicate no statistically significant relationship. This implies that user perceptions of usefulness, attitudes, and intentions to use YARA's platform are **not influenced by their age.**

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
PU_Score	Western Europe (e.g., Germany, France, UK, Netherlands, Belgium, Switzerland, Austria, Luxembourg)	73	5.3288	0.91795	0.10744	5.1146	5.5429	3.40	7.00
	Southern Europe (e.g., Italy, Spain, Portugal, Greece, Croatia, Malta, Cyprus)	29	5.0414	1.32706	0.24643	4.5366	5.5462	3.00	7.00
	Eastern Europe (e.g., Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Ukraine)	4	6.2000	0.93808	0.46904	4.7073	7.6927	5.20	7.00
	Northern Europe (e.g., Sweden, Denmark, Norway, Finland, Iceland, Estonia, Latvia, Lithuania)	4	5.8500	0.59722	0.29861	4.8997	6.8003	5.00	6.40
	Total	110	5.3036	1.04985	0.10010	5.1052	5.5020	3.00	7.00
ATU_Score	Western Europe (e.g., Germany, France, UK, Netherlands, Belgium, Switzerland, Austria, Luxembourg)	73	5.3562	1.14861	0.13443	5.0882	5.6242	2.00	7.00
	Southern Europe (e.g., Italy, Spain, Portugal, Greece, Croatia, Malta, Cyprus)	29	5.0086	1.44618	0.26855	4.4585	5.5587	2.25	7.00
	Eastern Europe (e.g., Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Ukraine)	4	5.5625	0.71807	0.35904	4.4199	6.7051	4.50	6.00
	Northern Europe (e.g., Sweden, Denmark, Norway, Finland, Iceland, Estonia, Latvia, Lithuania)	4	5.6875	1.49129	0.74565	3.3145	8.0605	3.50	6.75
	Total	110	5.2841	1.23150	0.11742	5.0514	5.5168	2.00	7.00
BI_Score	Western Europe (e.g., Germany, France, UK, Netherlands, Belgium, Switzerland, Austria, Luxembourg)	73	4.8185	1.24810	0.14608	4.5273	5.1097	1.25	7.00
	Southern Europe (e.g., Italy, Spain, Portugal, Greece, Croatia, Malta, Cyprus)	29	4.6121	1.57206	0.29192	4.0141	5.2100	2.00	7.00
	Eastern Europe (e.g., Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Ukraine)	4	6.0000	0.81650	0.40825	4.7008	7.2992	5.00	7.00
	Northern Europe (e.g., Sweden, Denmark, Norway, Finland, Iceland, Estonia, Latvia, Lithuania)	4	5.6875	0.74652	0.37326	4.4996	6.8754	4.75	6.50
	Total	110	4.8386	1.33693	0.12747	4.5860	5.0913	1.25	7.00

While correlation didn't show significance, we conducted ANOVA which could have uncovered hidden group-level differences that correlation might miss. Results showed no significant differences (all p-values > 0.05), suggesting that perceptions of usefulness, attitudes, and behavioral intentions are consistent across these age and regions.

4. Motivation to Learning and Approach to Learning

4.1 Interpretation of Crosstabulation and Chi-Square Test Results

The table provides insights into how different motivations map to various learning styles.

Approachtolearning_Group * Motivationtolearning_Group Crosstabulation

			Motivationtolearning_Group				
			Achieving personal goals or mastery of a skill	Earning rewards or recognition	Collaborating or connecting with others during learning	Feeling competent and able to apply what I've learned quickly	Total
Approachtolearning_Group	1.00	Count	22	4	7	24	57
		% within Approachtolearning_Group	38.6%	7.0%	12.3%	42.1%	100.0%
		% within Motivationtolearning_Group	64.7%	40.0%	63.6%	53.3%	57.0%
		% of Total	22.0%	4.0%	7.0%	24.0%	57.0%
	3.00	Count	8	3	2	14	27
		% within Approachtolearning_Group	29.6%	11.1%	7.4%	51.9%	100.0%
		% within Motivationtolearning_Group	23.5%	30.0%	18.2%	31.1%	27.0%
		% of Total	8.0%	3.0%	2.0%	14.0%	27.0%
	4.00	Count	4	3	2	7	16
		% within Approachtolearning_Group	25.0%	18.8%	12.5%	43.8%	100.0%
		% within Motivationtolearning_Group	11.8%	30.0%	18.2%	15.6%	16.0%
		% of Total	4.0%	3.0%	2.0%	7.0%	16.0%
Total		Count	34	10	11	45	100
		% within Approachtolearning_Group	34.0%	10.0%	11.0%	45.0%	100.0%
		% within Motivationtolearning_Group	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	34.0%	10.0%	11.0%	45.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.480[a]	6	.747
Likelihood Ratio	3.342	6	.765
Linear-by-Linear Association	.505	1	.477
N of Valid Cases	100		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is 1.60.

Motivationtolearning_Group * Approachtolearning_Group Crosstabulation

			Approachtolearning_Group				
			I prefer trying things out and learning by doing	I prefer thinking deeply and observing before taking action	I prefer learning from structured models or theories	I prefer exploring new experiences and adapting to challenges	Total
Motivationtolearning_Group	Achieving personal goals or mastery of a skill	Count	22	8	1	4	35
		% within Motivationtolearning_Group	62.9%	22.9%	2.9%	11.4%	100.0%
		% within Approachtolearning_Group	38.6%	29.6%	10.0%	25.0%	31.8%
		% of Total	20.0%	7.3%	0.9%	3.6%	31.8%
	Earning rewards or recognition	Count	4	3	2	3	12
		% within Motivationtolearning_Group	33.3%	25.0%	16.7%	25.0%	100.0%
		% within Approachtolearning_Group	7.0%	11.1%	20.0%	18.8%	10.9%
		% of Total	3.6%	2.7%	1.8%	2.7%	10.9%
	Collaborating or connecting with others during learning	Count	7	2	0	2	11
		% within Motivationtolearning_Group	63.6%	18.2%	0.0%	18.2%	100.0%
		% within Approachtolearning_Group	12.3%	7.4%	0.0%	12.5%	10.0%
		% of Total	6.4%	1.8%	0.0%	1.8%	10.0%
	Feeling competent and able to apply what I've learned quickly	Count	24	14	7	7	52
		% within Motivationtolearning_Group	46.2%	26.9%	13.5%	13.5%	100.0%
		% within Approachtolearning_Group	42.1%	51.9%	70.0%	43.8%	47.3%
		% of Total	21.8%	12.7%	6.4%	6.4%	47.3%
Total		Count	57	27	10	16	110
		% within Motivationtolearning_Group	51.8%	24.5%	9.1%	14.5%	100.0%
		% within Approachtolearning_Group	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	51.8%	24.5%	9.1%	14.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.200[a]	9	.514
Likelihood Ratio	9.380	9	.403
Linear-by-Linear Association	.959	1	.327
N of Valid Cases	110		

a. 8 cells (50.0%) have expected count less than 5. The minimum expected count is 1.00.

Dominant Trends in Learning Styles

Active Experimentation ("Trying things out and learning by doing"): Intrinsically motivated individuals (62.9%). Those motivated by relatedness (63.6%).

Reflective Observation ("Thinking deeply and observing"): Strongly preferred by those motivated by competence (51.9%).

Structured Models ("Learning from theories"): Shows the lowest overall preference but aligns with competence-driven learners (13.5%).

Concrete Experience ("Exploring new challenges"): Exhibits a balanced presence, most popular among extrinsically motivated learners (25.0%).

Motivational Drivers Across Groups

Competence: The most common driver across all learning styles (47.3% overall).

Personal Goals (Intrinsic Motivation): A strong focus for action-oriented learners (38.6%).

Collaboration (Relatedness): Noticeable for individuals favoring hands-on approaches (12.3% within "Trying things out").

Extrinsic Motivation (Rewards): Displays a wide distribution across styles, favoring novelty and outcomes.

5. Motivation across TAM Constructs

This analysis examined whether different motivation groups (e.g., intrinsic, extrinsic, relatedness, competence) influenced the Technology Acceptance Model (TAM) constructs: Perceived Usefulness (PU), Attitude Toward Usage (ATU), and Behavioral Intention (BI). The goal was to identify if specific motivational drivers correlated with stronger scores in these TAM constructs, which could guide design strategies for YARA.

5.1 Descriptive Statistics

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
PU_Score	Achieving personal goals or mastery of a skill	35	5.1714	0.93323	0.15775	4.8509	5.4920	3.40	7.00
	Earning rewards or recognition	12	5.8833	0.80208	0.23154	5.3737	6.3930	4.20	7.00
	Collaborating or connecting with others during learning	11	5.7273	0.89565	0.27005	5.1256	6.3290	4.80	7.00
	Feeling competent and able to apply what I've learned quickly	52	5.1692	1.15360	0.15998	4.8481	5.4904	3.00	7.00
	Total	110	5.3036	1.04985	0.10010	5.1052	5.5020	3.00	7.00
ATU_Score	Achieving personal goals or mastery of a skill	35	4.9429	1.27344	0.21525	4.5054	5.3803	2.00	6.75
	Earning rewards or recognition	12	5.8333	0.76376	0.22048	5.3481	6.3186	4.25	7.00
	Collaborating or connecting with others during learning	11	6.1364	0.75302	0.22705	5.6305	6.6423	5.00	7.00
	Feeling competent and able to apply what I've learned quickly	52	5.2067	1.26870	0.17594	4.8535	5.5599	2.50	7.00
	Total	110	5.2841	1.23150	0.11742	5.0514	5.5168	2.00	7.00
BI_Score	Achieving personal goals or mastery of a skill	35	4.6500	1.25323	0.21183	4.2195	5.0805	1.25	6.25
	Earning rewards or recognition	12	5.6250	0.96825	0.27951	5.0098	6.2402	3.25	7.00
	Collaborating or connecting with others during learning	11	5.4091	1.23122	0.37123	4.5819	6.2362	3.25	7.00
	Feeling competent and able to apply what I've learned quickly	52	4.6635	1.41498	0.19622	4.2695	5.0574	2.00	7.00
	Total	110	4.8386	1.33693	0.12747	4.5860	5.0913	1.25	7.00

5.2 ANOVA

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
PU_Score	Based on Mean	1.758	3	106	0.160
	Based on Median	1.756	3	106	0.160
	Based on Median and with adjusted df	1.756	3	104.018	0.160
	Based on trimmed mean	1.748	3	106	0.162
ATU_Score	Based on Mean	3.864	3	106	0.011
	Based on Median	3.343	3	106	0.022
	Based on Median and with adjusted df	3.343	3	100.724	0.022
	Based on trimmed mean	3.657	3	106	0.015
BI_Score	Based on Mean	1.412	3	106	0.243
	Based on Median	1.236	3	106	0.300
	Based on Median and with adjusted df	1.236	3	105.403	0.300
	Based on trimmed mean	1.406	3	106	0.245

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
PU_Score	Between Groups	7.558	3	2.519	2.372	0.075
	Within Groups	112.581	106	1.062		
	Total	120.139	109			
ATU_Score	Between Groups	15.997	3	5.332	3.785	0.013
	Within Groups	149.313	106	1.409		
	Total	165.310	109			
BI_Score	Between Groups	13.841	3	4.614	2.702	0.049
	Within Groups	180.982	106	1.707		
	Total	194.823	109			

ANOVA Effect Sizes[a,b]

			95% Confidence Interval	
		Point Estimate	Lower	Upper
PU_Score	Eta-squared	0.063	0.000	0.147
	Epsilon-squared	0.036	-0.028	0.123
	Omega-squared Fixed-effect	0.036	-0.028	0.122
	Omega-squared Random-effect	0.012	-0.009	0.044
ATU_Score	Eta-squared	0.097	0.005	0.193
	Epsilon-squared	0.071	-0.023	0.171
	Omega-squared Fixed-effect	0.071	-0.023	0.169
	Omega-squared Random-effect	0.025	-0.008	0.064
BI_Score	Eta-squared	0.071	0.000	0.159
	Epsilon-squared	0.045	-0.028	0.135
	Omega-squared Fixed-effect	0.044	-0.028	0.134
	Omega-squared Random-effect	0.015	-0.009	0.049

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

5.3 Post-Hoc Tests (Tukey HSD)

The Tukey HSD (Honestly Significant Difference) test is a post-hoc analysis performed after ANOVA when you find significant differences in your ANOVA results. It helps determine which specific groups differ significantly from each other.

Homogeneous Subsets

PU_Score

Tukey HSD[a,b]

Motivationtolearning_Group	N	Subset for alpha = 0.05
		1
Feeling competent and able to apply what I've learned quickly	52	5.1692
Achieving personal goals or mastery of a skill	35	5.1714
Collaborating or connecting with others during learning	11	5.7273
Earning rewards or recognition	12	5.8833
Sig.		.166

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 18.014.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ATU_Score

Tukey HSD[a,b]

Motivationtolearning_Group	N	Subset for alpha = 0.05	
		1	2
Achieving personal goals or mastery of a skill	35	4.9429	
Feeling competent and able to apply what I've learned quickly	52	5.2067	5.2067
Earning rewards or recognition	12	5.8333	5.8333
Collaborating or connecting with others during learning	11		6.1364
Sig.		.116	.093

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 18.014.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

BI_Score

Tukey HSD[a,b]

Motivationtolearning_Group	N	Subset for alpha = 0.05
		1
Achieving personal goals or mastery of a skill	35	4.6500
Feeling competent and able to apply what I've learned quickly	52	4.6635
Collaborating or connecting with others during learning	11	5.4091
Earning rewards or recognition	12	5.6250
Sig.		.119

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 18.014.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Tukey HSD for PU_Score (Perceived Usefulness)

There are no significant differences (0.166) in Perceived Usefulness across motivational groups. This aligns with the ANOVA result for PU (p = 0.075), indicating PU is perceived uniformly.

Tukey HSD for ATU_Score (Attitude Toward Use)

Group differences between motivational categories are close to significant. Achieving personal goals (4.94) vs. Collaborating with others (6.13) has a borderline p-value (Sig. = 0.093).

Tukey HSD for BI_Score (Behavioral Intention)

Similar to PU, the p-value for BI differences across motivational groups is greater than 0.05, so there are no statistically significant differences.

6. Features

6.1 Descriptive Statistics

This section focuses on analyzing the relationship between specific feature preferences and motivational drivers among users.

Deskriptive Statistik

Deskriptive Statistiken

	N	Minimum	Maximum	Mittelwert	Std.-Abweichung
PEUO Question 1	110	1	7	5.02	1.603
PEUO Question 2	110	1	7	5.10	1.381
PEUO Question 3	110	1	7	5.22	1.667
PEUO Question 4	110	1	7	5.70	1.216
Gültige Werte (listenweise)	110				

PEUO Question 1 = Feature 1 (Peer Progress Tracking in a Non-Competitive Way)
PEUO Question 2 = Feature 2 (Milestone Tracking)
PEUO Question 3 = Feature 3 (Anonymous Progress Comparison)
PEUO Question 4 = Feature 4 (Customizable Peer Views)

6.2 Features Preferences and Motivation Correlations

Nichtparametrische Korrelationen

Korrelationen

			PEUO Question 1	PEUO Question 2	PEUO Question 3	PEUO Question 4	Motivationtolearning_Group
Spearman-Rho	PEUO Question 1	Korrelationskoeffizient	1.000	.025	.278**	.179	.106
		Sig. (2-seitig)	.	.799	.003	.061	.273
		N	110	110	110	110	110
	PEUO Question 2	Korrelationskoeffizient	.025	1.000	.082	.278**	.123
		Sig. (2-seitig)	.799	.	.397	.003	.201
		N	110	110	110	110	110
	PEUO Question 3	Korrelationskoeffizient	.278**	.082	1.000	.263**	.267**
		Sig. (2-seitig)	.003	.397	.	.005	.005
		N	110	110	110	110	110
	PEUO Question 4	Korrelationskoeffizient	.179	.278**	.263**	1.000	.124
		Sig. (2-seitig)	.061	.003	.005	.	.199
		N	110	110	110	110	110
	Motivationtolearning_Group	Korrelationskoeffizient	.106	.123	.267**	.124	1.000
		Sig. (2-seitig)	.273	.201	.005	.199	.
		N	110	110	110	110	110

**. Die Korrelation ist auf dem 0,01 Niveau signifikant (zweiseitig).

6.3 Features Preferences and Confidence Level Correlations

Goal: Understand how the preference for correlates with confidence in financial literacy.

Nonparametric Correlations

Correlations

			PEUO Question 1	PEUO Question 2	PEUO Question 3	PEUO Question 4	ConfidenceCategory
Spearman's rho	PEUO Question 1	Correlation Coefficient	1.000	.025	.278**	.179	.203*
		Sig. (2-tailed)	.	.799	.003	.061	.033
		N	110	110	110	110	110
	PEUO Question 2	Correlation Coefficient	.025	1.000	.082	.278**	.162
		Sig. (2-tailed)	.799	.	.397	.003	.091
		N	110	110	110	110	110
	PEUO Question 3	Correlation Coefficient	.278**	.082	1.000	.263**	-.034
		Sig. (2-tailed)	.003	.397	.	.005	.725
		N	110	110	110	110	110
	PEUO Question 4	Correlation Coefficient	.179	.278**	.263**	1.000	.067
		Sig. (2-tailed)	.061	.003	.005	.	.485
		N	110	110	110	110	110
	ConfidenceCategory	Correlation Coefficient	.203*	.162	-.034	.067	1.000
		Sig. (2-tailed)	.033	.091	.725	.485	.
		N	110	110	110	110	110

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Feature 1 shows a significant positive correlation with confidence level, suggesting a targeted design strategy for confident vs. less confident users. Features 2–4 are unrelated to confidence, so their development can focus on broader user needs without segmentation by confidence.

7. Comfort with AI based investment advice

Deskriptive Statistik

Deskriptive Statistiken

	N	Minimum	Maximum	Mittelwert	Std.-Abweichung
Comfort of AI-based investment advice	110	1	5	3.79	.996
Gültige Werte (listenweise)	110				

To explore users' openness to AI-driven financial tools, the final question in the survey assessed participants' comfort levels with receiving investment advice generated by artificial intelligence, measured on a 5-poiny Likert scale. It was found that people feel neutral to confident of receiving AI investment advice (mean of 3.79 (out of 1-5)).

Disclaimer

This thesis is the result of the authors' original work, reflecting our independent research, analysis, and ideas. To ensure clarity and accuracy in language, we used ChatGPT exclusively for grammar and spelling checks. All external sources and contributions have been thoroughly acknowledged and appropriately cited to uphold the highest standards of academic integrity.