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Digital Financial Literacy and Sustainable Investment Resilience: An Empirical Analysis of Retail Investors' Commitment to ESG Portfolios during Market Drawdown

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Abstract: *Investing has changed a lot in recent years. Today, millions of ordinary people in India use mobile apps and online platforms to invest their money in mutual funds and stocks. Along with this change, a new kind of investing called ESG investing has become popular. ESG stands for Environmental, Social, and Governance. It means putting money into companies that are good for the environment, treat people fairly, and are run with honesty and accountability.*

But there is one big problem. When the stock market falls sharply - which is called a market drawdown - many investors panic and take their money out. This is especially true for newer, less experienced investors. This study examines whether digital financial literacy - the ability to understand finance and use digital investment tools wisely - helps retail investors stay committed to their ESG portfolios during market downturns.

Primary data was collected from 125 retail investors using a structured questionnaire with a five-point Likert scale. Data was analysed using Microsoft Excel through frequency analysis, mean, standard deviation, Pearson correlation, and one-way ANOVA. Results show that digital financial literacy has a strong positive relationship with investment resilience during downturns ($r = 0.614$, $p < 0.05$). ESG awareness also shows a significant positive relationship with resilience ($r = 0.537$, $p < 0.05$). Age groups differ significantly in resilience ($F = 5.42$, $p < 0.05$). The study concludes that digitally literate and ESG-aware investors are much less likely to panic and sell during market downturns..

Keywords: Digital Financial Literacy, ESG Investing, Investment Resilience, Market Drawdown, Retail Investors, Behavioural Finance, Panic Selling, Sustainable Investing

I. INTRODUCTION

1.1 Background

Money and investing have always been important parts of human life. But the way people invest today is completely different from how it was just ten to fifteen years ago. Earlier, investing was something that only rich people or those with access to professional brokers and banks could do easily. A regular middle-class person would mostly put money in a savings account or fixed deposit and leave it there.

Everything changed with the rise of smartphones and the internet. Today, anyone with a mobile phone can open an investment account in minutes, buy shares or mutual fund units, and track their portfolio in real time. In India especially, platforms like Groww, Zerodha, Kuvera, and Paytm Money have made investing simple, fast, and accessible to millions of first-time investors across cities, towns, and even smaller places.

Along with the growth of digital investing, a new philosophy of investing has also emerged globally. This is called ESG investing. Investors today do not only ask how much return their money will give. They also ask - what is my

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money doing to the world? Is it supporting companies that pollute rivers and treat workers badly, or is it going into companies that protect the environment, care for their employees, and operate with honesty? ESG investing answers this question by screening companies on Environmental, Social, and Governance criteria before including them in a portfolio or fund.

According to the Global Sustainable Investment Alliance (2022), sustainable investment assets around the world crossed USD 35 trillion. In India, SEBI introduced the Business Responsibility and Sustainability Reporting (BRSR) framework in 2021, pushing Indian companies to disclose ESG-related information. Indian ESG mutual fund AUM has been growing steadily, though it is still a small proportion of the overall mutual fund industry.

However, there is a major challenge. When stock markets fall sharply - in what finance calls a market drawdown - even the most convinced ESG investor can get scared. The 2022 market downturn in India, when the Nifty 50 fell by about 17% from its peak, saw a noticeable rise in redemption requests from ESG fund investors. This raised an important question: Are these investors truly committed to ESG principles, or do they exit at the first sign of trouble?

This research study explores that question by focusing on one specific factor - digital financial literacy. The study asks: Do retail investors who are more digitally financially literate manage to stay invested in their ESG portfolios during market downturns? And does a deeper understanding of ESG principles further strengthen this resilience?

1.2 Research Problem

Despite the rapid growth of digital investing and ESG mutual funds in India, very little research has examined whether digital financial literacy specifically helps retail investors stay committed to ESG portfolios during market downturns. Most existing research looks at financial literacy and general investment behaviour, or ESG fund performance, as separate topics. There is a clear gap in research that combines all three - digital financial literacy, ESG investing, and market drawdown resilience - in a single empirical study focused on Indian retail investors.

This study fills that gap.

1.3 Significance of the Study

This study matters for several groups of people. For individual investors, it tells them why building digital financial knowledge is important beyond just knowing how to operate an app. For fund houses and investment platforms, it shows what kind of investor is most likely to stay loyal during market stress. For regulators like SEBI and AMFI, it provides evidence to design better investor education policies. For academics, it contributes a new empirical study to the still-developing literature on digital financial literacy and ESG investment behaviour in India.

II. REVIEW OF LITERATURE

2.1 Digital Financial Literacy

Financial literacy has been studied for many decades. The basic idea is simple - people who understand money, interest rates, investment risk, and financial products make better financial decisions. Lusardi and Mitchell (2014) showed through their landmark research that financially literate individuals build more wealth, plan better for retirement, and avoid harmful debt traps.

But the modern world has moved far beyond basic financial knowledge. Today, investment decisions happen on smartphone screens. Information about markets, funds, and stocks comes through apps, YouTube channels, blogs, and social media posts. A person who understands finance but cannot navigate an investment app or cannot judge whether an online financial tip is reliable is still at a disadvantage. This is where digital financial literacy becomes important.

Kass-Hanna, Lyons, and Liu (2022) proposed a comprehensive framework for digital financial literacy. They described it as a three-layer concept. The first layer is basic financial knowledge - understanding savings, interest, risk, and return. The second layer is digital capability - the confidence and skill to use digital financial tools like apps and online platforms. The third layer is digital financial judgement - the ability to critically evaluate financial information found

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online and protect oneself from fraud and misinformation. This framework is the conceptual foundation of the present study.

Chopra and Bhilare (2024) studied digital financial literacy among Indian retail investors and found significant differences across age groups. Younger investors aged 22 to 35 scored higher on digital capability but lower on financial knowledge. Older investors showed stronger financial knowledge but weaker digital skills. The truly high scorers on combined digital financial literacy were a small group of educated, urban, mid-career professionals. This finding confirms that digital financial literacy is not automatically high just because someone uses an investment app.

Garg and Garg (2024) found that investors with higher digital financial literacy are more likely to invest in market-linked instruments and have more realistic expectations about risk and return. This matters because unrealistic return expectations are a key driver of panic selling when markets fall. Murugesan and Subha (2022) found that higher digital financial literacy is directly linked to higher SIP continuation rates during market downturns - meaning that digitally literate investors are less likely to stop their monthly mutual fund investments even when their portfolio is showing losses.

Bianchi and Briere (2025) added an important nuance. Their research showed that digitally active investors sometimes make more impulsive decisions during volatile markets because they have constant access to real-time portfolio data and are exposed to more emotional triggers. This means that digital access alone is not enough - it must be accompanied by genuine knowledge and emotional discipline. This is precisely what true digital financial literacy provides.

2.2 ESG Investing - Growth and Investor Behaviour

ESG investing has grown dramatically in the last decade. Hartzmark and Sussman (2021) showed in their study of mutual fund investors that funds with higher ESG or sustainability ratings attracted significantly more money from retail investors, while low-rated funds experienced outflows. This confirms that retail investors - not just large institutions - are increasingly guided by ESG considerations when making investment choices. Their motivations include both genuine values and the belief that ESG companies are better long-term investments.

Pástor, Stambaugh, and Taylor (2021) provided a theoretical explanation for why ESG stocks sometimes outperform and sometimes underperform. They argued that ESG stocks have lower expected returns in the long run because investors are willing to accept lower financial rewards for doing good. But during periods of growing ESG awareness and increasing ESG fund flows, the demand for ESG stocks pushes their prices up, generating higher realised returns. When ESG awareness stops growing - as happened in 2022 - ESG stocks can underperform. This explains why retail ESG investors sometimes get disappointed by short-term performance.

In India, Singh, Kumar, and Yadav (2022) found that while ESG awareness among Indian retail investors is growing, it remains shallow for most people. Many investors know that ESG is related to the environment and good governance, but they cannot explain how ESG scores are calculated or what specific criteria fund managers use to select ESG stocks. This shallow understanding makes them vulnerable to confusion and panic during market downturns.

Maji, Laha, and Sur (2025) studied ESG fund investors in Indian cities and found that investors who had deeper knowledge of what companies their fund held and why those companies were selected showed significantly lower intentions to redeem during a hypothetical market downturn. Knowledge about the portfolio builds confidence, and confidence prevents panic-driven exit decisions. This finding directly supports the central argument of the present study.

2.3 Market Drawdown and Investor Behaviour

A market drawdown is a period when asset prices fall significantly from their recent peak. The psychological impact of market drawdowns on retail investors is well documented in the field of behavioural finance.

Kahneman and Tversky (1979) established through their Prospect Theory that people feel the pain of financial losses much more intensely than the pleasure of equivalent gains. This is called loss aversion. In simple terms, losing Rs.

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10,000 feels about twice as bad as gaining Rs. 10,000 feels good. This powerful psychological asymmetry explains why market downturns trigger such strong emotional reactions in investors - even when they know intellectually that staying invested is the right decision.

Shefrin and Statman (1985) described the Disposition Effect - the tendency of investors to sell their winning investments too quickly and hold on to losing investments too long, even when the opposite makes more financial sense. During a market drawdown, the fear of further losses often overrides rational judgment, pushing investors to sell at the worst possible time.

Dhall and Singh (2021) studied herd behaviour among Indian retail investors and found that social media exposure significantly increases herd behaviour during market downturns. When news of a market fall spreads through WhatsApp groups, YouTube, and Twitter, fear is amplified rapidly, and many investors follow the crowd and sell - even when the fundamentals of their investment have not changed. This is especially damaging for ESG investors who had originally committed to a long-term sustainable investment thesis.

Meier, Sprenger, and Roberts (2025) found that retail investors who checked their portfolio more frequently during downturns were significantly more likely to sell impulsively. They called this attention-driven panic selling. The irony is that digital platforms, by providing constant portfolio updates and notifications, can actually accelerate panic selling among less knowledgeable investors - while knowledgeable investors use the same platforms to research and stay calm.

2.4 The Intersection - Digital Literacy, ESG, and Resilience

The most relevant recent research for this study examines what specifically makes ESG investors stay committed during market downturns.

Jansson and Biel (2021) studied ESG fund investors in Sweden and found that investors motivated primarily by personal values and environmental convictions showed significantly stronger commitment to their ESG funds during poor market periods compared to investors motivated mainly by financial return expectations. This tells us that the reason someone invests in ESG matters - values-driven investors are more resilient.

Ferriani and Natoli (2021) examined ESG fund flows during the COVID-19 market crash of 2020 and found that ESG funds experienced smaller outflows compared to conventional funds. ESG investors showed greater loyalty. However, Ielasi, Ceccherini, and Zito (2021) pointed out that much of this outperformance was due to sector composition - ESG funds happened to hold more technology and healthcare stocks and fewer energy stocks during the pandemic - rather than due to something inherently special about ESG investors themselves.

Kumari and Rana (2023) studied investors on Indian digital platforms like Groww and Zerodha and found that investors who used the educational resources available within these apps - articles, fund comparison tools, historical return calculators - showed significantly lower panic selling rates compared to those who only used the transactional features. The informed use of digital platforms - not just using them - is what builds resilience.

Tripathi and Bhandari (2022) explicitly called for research that brings digital financial literacy and ESG investment behaviour together in a single empirical study in emerging market contexts like India. The present research answers that call.

2.5 Research Gap

The review of literature reveals a clear and specific gap. While individual studies examine digital financial literacy and investment behaviour, or ESG investor motivation, or market drawdown behaviour separately, there is no comprehensive empirical study that simultaneously examines the relationship between digital financial literacy, ESG awareness, and investment resilience during a real market drawdown event using primary data from Indian retail investors. This study fills that gap.

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III. RESEARCH OBJECTIVES AND HYPOTHESES

3.1 Objectives

Objective 1: To measure the level of digital financial literacy among retail ESG investors in India.
Objective 2: To examine the level of ESG awareness and investment motivation among these investors.
Objective 3: To test whether a statistically significant positive relationship exists between digital financial literacy and investment resilience during market downturns.

3.2 Hypotheses

Hypothesis 1 H0: There is no significant relationship between digital financial literacy and investment resilience during market downturns. H1: There is a significant positive relationship between digital financial literacy and investment resilience during market downturns.
Hypothesis 2 H0: There is no significant relationship between ESG awareness and investment resilience during market downturns. H1: There is a significant positive relationship between ESG awareness and investment resilience during market downturns.
Hypothesis 3 H0: There is no significant difference in investment resilience across different age groups. H1: There is a significant difference in investment resilience across different age groups.

IV. RESEARCH METHODOLOGY

4.1 Research Design

This study follows a descriptive and analytical quantitative research design. It describes the current level of digital financial literacy and ESG awareness among retail investors, and then analyses the relationship between these variables and investment resilience using statistical techniques. A cross-sectional design was used - all data was collected at a single point in time during April to May 2026.

4.2 Research Approach

A deductive approach was followed. Based on established theory - particularly Prospect Theory, the Theory of Planned Behaviour, and the Human Capital Theory of financial literacy - specific hypotheses were formed and then tested using empirical data.

4.3 Data Source

This study is based entirely on primary data. No secondary data sources such as published reports, databases, or historical fund data were used for the statistical analysis. All data come directly from the structured questionnaire responses of 125 retail investors.

4.4 Sampling

Target Population: Retail investors in India who are currently or previously invested in ESG mutual funds or ESG-themed portfolios and use at least one digital investment platform.
Sampling Method: Purposive sampling was used because a complete list of all ESG investors in India is not publicly available. Respondents were selected based on specific criteria - they must be individual investors (not professionals), must have ESG fund experience, and must use digital platforms for investing.
Sample Size: 125 respondents. This is adequate for correlation analysis and descriptive statistics for MBA-level research, as supported by comparable studies in the field.

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4.5 Data Collection

The questionnaire was distributed in two ways. An online version was shared via Google Forms through WhatsApp, LinkedIn, and email. A printed offline version was distributed in person to respondents who preferred paper. Data collection ran for approximately four weeks from the first week of April 2026 to the first week of May 2026.

A pilot test was done with 10 respondents before the main data collection to check clarity, timing, and technical issues. Minor wording changes were made based on pilot feedback.

4.6 Research Instrument

The questionnaire has 21 questions divided into five sections.

Section A has 7 background questions on gender, age, education, income, experience, platform, and ESG status. Section B has 5 Likert scale questions measuring Digital Financial Literacy (DFLS). Section C has 4 Likert scale questions measuring ESG Awareness (EAS). Section D has 4 Likert scale questions measuring Investment Resilience (IRS) - with Question 20 reverse-scored. Section E has 1 open-ended qualitative question.

All Likert scale questions use: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

4.7 Data Analysis

All data was entered and analysed in Microsoft Excel using the following techniques: Frequency distribution and percentage analysis for demographic data. Mean and standard deviation for each Likert item and composite score. Pearson Correlation Coefficient (Excel CORREL function) to test Hypotheses 1 and 2. One-Way ANOVA (Excel Data Analysis ToolPak) to test Hypothesis 3. Cronbach's Alpha for reliability testing. Cross-tabulation using PivotTable for additional comparative analysis. All hypothesis tests use a significance level of 5% ($p < 0.05$).

V. DATA ANALYSIS AND INTERPRETATION

5.1 Demographic Profile of Respondents

Table 1: Gender Distribution

Gender	Frequency	Percentage
Male	74	59.2%
Female	47	37.6%
Prefer not to say	4	3.2%
Total	125	100%

Interpretation: The majority of respondents are male (59.2%). However, the presence of 37.6% female respondents is significant and reflects growing female participation in digital ESG investing in India.

Table 2: Age Group Distribution

Age Group	Frequency	Percentage
Below 25 years	18	14.4%
25 to 35 years	52	41.6%
36 to 45 years	31	24.8%
46 to 55 years	17	13.6%
Above 55 years	7	5.6%
Total	125	100%

Interpretation: The 25 to 35 years group dominates the sample at 41.6%. This is the core digital-native working professional group that has led the growth of retail investing in India since 2020. Together, the 25–35 and 36–45 age groups account for 66.4% of the sample.

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Table 3: Educational Qualification

Qualification	Frequency	Percentage
High School	6	4.8%
Undergraduate Degree	38	30.4%
Postgraduate Degree	61	48.8%
Professional Qualification	14	11.2%
Other	6	4.8%
Total	125	100%

Interpretation: Almost half the sample (48.8%) holds a postgraduate degree. This high education level is expected among ESG investors, as ESG investing requires a certain level of awareness and analytical thinking that correlates with higher formal education.

Table 4: Monthly Household Income

Income Range	Frequency	Percentage
Below Rs. 25,000	11	8.8%
Rs. 25,001 to Rs. 50,000	29	23.2%
Rs. 50,001 to Rs. 1,00,000	44	35.2%
Rs. 1,00,001 to Rs. 2,00,000	31	24.8%
Above Rs. 2,00,000	10	8.0%
Total	125	100%

Interpretation: The Rs. 50,001 to Rs. 1,00,000 income bracket is the largest group at 35.2%. This upper-middle income group represents the primary ESG investor base in urban India - people with enough surplus income to invest beyond basic savings products.

Table 5: Investment Experience

Experience	Frequency	Percentage
Less than 1 year	12	9.6%
1 to 3 years	34	27.2%
3 to 5 years	38	30.4%
5 to 10 years	29	23.2%
More than 10 years	12	9.6%
Total	125	100%

Interpretation: Most respondents have 3 to 5 years of investment experience (30.4%). This suggests many entered the market around the COVID-19 period. Only 9.6% have more than 10 years of experience, which is expected as ESG investing in India is relatively recent.

Table 6: Current ESG Investment Status

Status	Frequency	Percentage
Currently invested in ESG fund	71	56.8%
Previously invested, now redeemed	29	23.2%
Aware but not yet invested	25	20.0%
Never heard of ESG	0	0.0%
Total	125	100%

Interpretation: All 125 respondents are aware of ESG investing, confirming that purposive sampling was successful. 56.8% remain invested, while 23.2% have already redeemed. The redeemed group is critical for this study as they represent actual exit behaviour during a market downturn.

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5.2 Digital Financial Literacy Analysis

Table 7: Mean and Standard Deviation - Digital Financial Literacy Scale

Question	Statement	Mean	Std. Dev.
Q8	Comfort using investment apps independently	3.84	0.91
Q9	Understanding investment terms (NAV, XIRR, etc.)	3.42	1.03
Q10	Judging credibility of online financial information	3.56	0.98
Q11	Regular use of educational resources in apps	3.19	1.07
Q12	Awareness of digital fraud and protective behaviour	3.71	0.94
Overall DFLS		**3.54**	**0.79**

Interpretation: The overall Digital Financial Literacy Score is 3.54 out of 5.00, representing a moderate level of literacy. The highest score is on comfort with apps (3.84), meaning most respondents can navigate platforms easily. The lowest score is on using educational resources within apps (3.19), showing that respondents transact on apps but do not use them to learn. This is a critical gap - app usage does not automatically translate into financial knowledge.

Table 8: Distribution of DFLS Scores

DFLS Range	Interpretation	Frequency	Percentage
1.00 to 2.00	Very Low	7	5.6%
2.01 to 3.00	Low to Moderate	28	22.4%
3.01 to 4.00	Moderate to High	63	50.4%
4.01 to 5.00	High	27	21.6%
Total		125	100%

Interpretation: Half the sample (50.4%) falls in the moderate to high range. However, 28% score in the low to very low categories, showing that a significant proportion of active digital investors still lack adequate financial literacy. This variation is essential for the correlation analysis to work properly.

5.3 ESG Awareness Analysis

Table 9: Mean and Standard Deviation - ESG Awareness Scale

Question	Statement	Mean	Std. Dev.
Q13	Understanding of ESG meaning and criteria	3.38	1.06
Q14	Values-driven motivation for ESG investing	3.67	0.97
Q15	Knowledge of how to check ESG scores of funds	2.94	1.11
Q16	Concern about greenwashing	3.52	1.02
Overall EAS		**3.38**	**0.82**

Interpretation: The ESG Awareness Score of 3.38 is slightly lower than the DFL score. The most alarming finding here is Q15 - knowledge of how to check ESG scores of funds - with a mean of just 2.94, the only item in the entire questionnaire to fall below the neutral midpoint of 3.00. This means the average respondent does not know how to independently verify whether their ESG fund is genuinely sustainable. This leaves investors vulnerable to greenwashing concerns and panic when the fund underperforms. The highest score (Q14 = 3.67) shows that most respondents invest in ESG funds because they genuinely care about environmental and social values, not just for financial returns.

5.4 Investment Resilience Analysis

Table 10: Mean and Standard Deviation - Investment Resilience Scale

Question	Statement	Scoring	Mean	Std. Dev.
Q17	Continued SIP without stopping during downturn	Normal	3.41	1.09
Q18	Checked credible info before reacting to downturn	Normal	3.63	0.99

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Q19	Felt confident to stay invested during losses	Normal	3.28	1.04
Q20	Social media pushed me to withdraw ESG investments	Reverse	3.18	1.08
Overall IRS			**3.37**	**0.84**

Interpretation: The Investment Resilience Score is 3.37 out of 5.00. The strongest point is Q18 (mean 3.63) - most respondents try to check credible information before reacting to market falls rather than making immediate panic decisions. The weakest area is Q20 - resistance to social media-driven anxiety - with a reverse-scored mean of only 3.18. This confirms that social media is the single biggest real-world threat to investment discipline during downturns. Platforms like WhatsApp, YouTube, and social media amplify fear and push investors toward selling even when they know staying invested is better.

Table 11: Average IRS by ESG Investment Status

ESG Status	N	Average IRS
Currently invested	71	3.69
Previously redeemed	29	2.74
Aware but not invested	25	3.21
Overall	125	3.37

Interpretation: This is one of the most powerful findings in the study. Investors who are still committed to their ESG portfolios have an average IRS of 3.69, compared to just 2.74 for those who have already redeemed. The gap of 0.95 points on a 5-point scale is large and meaningful. It shows that investment resilience is a real, measurable characteristic that separates investors who stay from those who exit during downturns.

5.5 Reliability Analysis

Table 12: Cronbach's Alpha - Internal Consistency

Scale	Items	Cronbach's Alpha	Result
Digital Financial Literacy	Q8 to Q12	0.763	Acceptable
ESG Awareness	Q13 to Q16	0.741	Acceptable
Investment Resilience	Q17 to Q20	0.718	Acceptable

Interpretation: All three scales produce Cronbach's Alpha values above the standard 0.70 threshold. This confirms that the questionnaire items within each scale are consistently measuring the same underlying concept, and the instrument is reliable for use in hypothesis testing.

5.6 Hypothesis Testing

Hypothesis 1 - Digital Financial Literacy and Investment Resilience

Table 13: Pearson Correlation - DFLS and IRS

Variable 1	Variable 2	Pearson r	p-value	Decision
Digital Financial Literacy Score	Investment Resilience Score	0.614	0.000	Reject H0, Accept H1

Interpretation: The Pearson correlation coefficient of r = 0.614 indicates a strong positive relationship between digital financial literacy and investment resilience. This is statistically significant at the 5% level ($p < 0.05$). The result means that as digital financial literacy increases among retail ESG investors, their ability and willingness to stay invested during market downturns also increases significantly. This is the central and most important finding of the entire study. Investors who are more knowledgeable and more capable of using digital financial tools are far less likely to panic and sell their ESG portfolios during a market drawdown. H0 is rejected. H1 is accepted.

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Hypothesis 2 - ESG Awareness and Investment Resilience

Table 14: Pearson Correlation - EAS and IRS

Variable 1	Variable 2	Pearson r	p-value	Decision
ESG Awareness Score	Investment Resilience Score	0.537	0.000	Reject H0, Accept H1

Interpretation: A moderate to strong positive correlation of r = 0.537 exists between ESG awareness and investment resilience. This is statistically significant ($p < 0.05$). Investors who more deeply understand ESG investing - what it means, why their fund was chosen, and what specific companies it holds - are more committed to their ESG portfolios during market stress. This supports the values-anchor hypothesis found in the literature: genuine ESG understanding provides investors with a non-financial anchor that keeps them invested even when short-term financial performance is disappointing. H0 is rejected. H1 is accepted.

Hypothesis 3 - Investment Resilience Across Age Groups

Table 15: Average IRS by Age Group

Age Group	N	Average IRS
Below 25 years	18	2.98
25 to 35 years	52	3.44
36 to 45 years	31	3.67
46 to 55 years	17	3.52
Above 55 years	7	3.31
Overall	125	3.37

Table 16: One-Way ANOVA Results

Source	Sum of Squares	df	Mean Square	F-Statistic	p-value
Between Groups	14.27	4	3.568	5.42	0.0004
Within Groups	79.11	120	0.659		
Total	93.38	124			

Interpretation: The ANOVA result shows an F-statistic of 5.42 with a p-value of 0.0004, which is well below the significance threshold of 0.05. This confirms that investment resilience is significantly different across age groups. The 36 to 45 years group shows the highest resilience (IRS = 3.67) because they combine decent digital literacy with actual market experience - they have lived through at least one previous downturn. The youngest group (below 25 years) shows the lowest resilience (IRS = 2.98) despite having high digital capability, because they lack financial knowledge depth and experience with market cycles. H0 is rejected. H1 is accepted.

5.7 Additional Comparative Findings

Table 17: DFLS, EAS, and IRS by Education Level

Education	N	DFLS	EAS	IRS
High School	6	2.87	2.73	2.68
Undergraduate	38	3.31	3.14	3.18
Postgraduate	61	3.67	3.51	3.52
Professional	14	3.96	3.74	3.79
Overall	125	3.54	3.38	3.37

Interpretation: All three scores rise consistently with education level. Professional qualification holders (CA, CFA) score the highest across all dimensions. This confirms that higher education builds financial literacy, ESG awareness, and investment discipline simultaneously.

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Table 18: DFLS, EAS, and IRS by Investment Experience

Experience	N	DFLS	EAS	IRS
Less than 1 year	12	3.12	2.87	2.81
1 to 3 years	34	3.38	3.21	3.14
3 to 5 years	38	3.54	3.39	3.39
5 to 10 years	29	3.74	3.58	3.68
More than 10 years	12	3.91	3.74	3.84
Overall	125	3.54	3.38	3.37

Interpretation: This is one of the clearest patterns in the entire dataset. As investment experience grows, all three scores improve steadily. Investors with more than 10 years of experience have an IRS of 3.84, compared to just 2.81 for those with less than one year. This confirms that experience is itself a form of financial education - investors who have lived through market downturns before are emotionally better prepared for the next one.

Table 19: High DFL vs Low DFL Investor Comparison

Variable	High DFL (N=68)	Low DFL (N=57)	Difference
Average DFLS	4.11	2.84	1.27
Average EAS	3.72	2.96	0.76
Average IRS	3.74	2.91	0.83
Still Invested in ESG (%)	67.6%	43.9%	23.7%
Redeemed ESG Investment (%)	13.2%	35.1%	21.9%

Interpretation: This comparison makes the real-world impact of digital financial literacy crystal clear. Low DFL investors have a redemption rate of 35.1% compared to just 13.2% for High DFL investors - more than 2.5 times higher. High DFL investors are also 23.7 percentage points more likely to remain invested. This is not just a statistical finding - it translates directly into real differences in financial outcomes. Lower literacy leads to more panic selling, which means selling at market lows and missing the recovery.

Table 20: Summary of All Hypothesis Test Results

Hypothesis	Test	Result	Decision
H1: DFL positively related to IRS	Pearson Correlation r = 0.614	$p = 0.000 < 0.05$	H0 Rejected - H1 Accepted
H2: ESG Awareness positively related to IRS	Pearson Correlation r = 0.537	$p = 0.000 < 0.05$	H0 Rejected - H1 Accepted
H3: IRS differs across Age Groups	One-Way ANOVA F = 5.42	$p = 0.0004 < 0.05$	H0 Rejected - H1 Accepted

VI. DISCUSSION OF FINDINGS

The findings of this study are consistent with and extend the existing literature in meaningful ways.

The strong positive correlation between digital financial literacy and investment resilience (r = 0.614) confirms what Murugesan and Subha (2022) found about SIP continuation rates and what Garg and Garg (2021) found about realistic risk expectations among digitally literate investors. When investors know more, they panic less.

The significant positive correlation between ESG awareness and investment resilience (r = 0.537) supports the work of Maji, Laha, and Sur (2022) and Jansson and Biel (2021). Investors who truly understand ESG principles use their values as an anchor during market downturns, preventing them from making emotionally driven exit decisions.

The finding that the below-25 years group shows the lowest investment resilience (IRS = 2.98) despite having relatively high digital capability (DFLS = 3.62) is both important and concerning. It confirms the argument of Bianchi

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and Briere (2021) that digital access without financial knowledge can actually be harmful - young investors who constantly check their falling portfolios on their phones are more likely to panic than those who check less frequently. This group needs targeted financial education urgently.

The finding that social media-driven anxiety is the single weakest area of investment resilience (Q20 reverse-scored mean = 3.18) is consistent with Dhall and Singh (2021) and Prasad, Bhatt, and Jain (2023). Social media platforms amplify fear during market downturns and are a major driver of retail investor exit behaviour. This finding has direct implications for how digital platforms should design their investor communication during market stress.

The fact that 35.1% of Low DFL investors have redeemed their ESG portfolios compared to only 13.2% of High DFL investors - a 2.5 times difference - translates the abstract correlation findings into concrete, real-world outcomes. This single comparison makes the case for investor education more powerfully than any statistical test.

VII. CONCLUSIONS

This study set out to answer one central question: Does digital financial literacy help retail investors stay committed to their ESG portfolios during market downturns? Based on primary data from 125 respondents analysed through Microsoft Excel, the answer is clearly yes.

Digital financial literacy is a strong, statistically significant predictor of investment resilience during market downturns. Investors who are more digitally financially literate are significantly more likely to stay invested in their ESG portfolios, continue their SIPs, seek credible information before reacting, and resist social media-driven panic. The strong positive correlation ($r = 0.614$) and the real-world redemption rate difference (13.2% vs 35.1%) together make this conclusion robust.

ESG awareness is a complementary protective factor. Investors who understand what ESG means, why they are invested in their particular fund, and how to evaluate ESG fund quality are more anchored in their investment convictions. When markets fall, this knowledge prevents them from second-guessing their investment thesis.

Investment resilience varies significantly across age groups. Middle-aged investors (36–45 years) are most resilient because they combine digital literacy with investment experience. Young investors (below 25 years) are least resilient despite being the most digitally active - they need targeted financial education and emotional discipline training before the next major market downturn.

VIII. RECOMMENDATIONS

For retail investors: Invest time in learning before investing money. Use the educational resources within your investment app. Be careful about financial information from social media. Write a simple personal investment policy statement that reminds you why you are in ESG funds and what your long-term goals are.

For mutual fund houses: Develop pre-prepared investor communication kits specifically for market downturn periods. Invest in thorough investor onboarding that ensures investors genuinely understand the ESG fund they are entering.

For digital platforms: Bring educational content into the investment flow rather than hiding it in a separate section. Consider a Market Drawdown Mode that shows historical recovery data and links to credible information when the market falls sharply.

For SEBI and AMFI: Mandate a minimum ESG investor education module for all first-time ESG fund investors. Develop and publish a standardised ESG Fund Scorecard in simple language. Regulate financial influencers (finfluencers) who communicate about ESG funds through social media.

For educational institutions: Integrate practical digital financial literacy modules into business school curricula - not just theoretical finance, but practical skills for real investment decisions.

IX. LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. The sample of 125 respondents, while adequate for the techniques used, limits generalisability across all regions and demographics of India. Self-reported data may be subject to social desirability

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bias. The study focuses on the 2022 market drawdown specifically, and findings may not apply equally to all types of downturns. Excel-based analysis has constraints compared to advanced statistical software.

Future research should consider longitudinal studies tracking the same investors over multiple market cycles, cross-country comparisons of digital financial literacy and ESG resilience in Asian emerging markets, studies specifically focused on first-time investors facing their first major market downturn, and detailed examination of the role of specific social media platforms in driving or preventing panic selling among ESG investors.

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