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THE IMPACT OF FINANCIAL LITERACY AND ARTIFICIAL INTELLIGENCE (AI) ON INVESTMENT DECISION MAKING

By:

MUHAMMAD ABDULLAH TAHIR **(01-321242-017)**

Supervisor:
RABIA UMER

HR and Management Department

Bahria University Islamabad

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Name of Student: **Enrollment #**

MUHAMMAD ABDULLAH TAHIR ***(01-321242-017)***

Class/Program: Master of Business Administration (MBA-1.5 Years Weekend)

Approved by:

_____

RABIA UMER
Supervisor

_____

QURAT UL AIN WAQAR
Research Coordinator

_____

DR. AFTAB HAIDER
Head of Department
Business Studies

ABSTRACT

This research study examines the impact of financial literacy and artificial intelligence on investment decision making, and how investor confidence can be used to bridge these variables and actual investment decisions. For many investors, it is becoming increasingly harder to make good financial decisions and they encounter difficulties because digital tools and financial products are becoming more sophisticated. Understanding these tools and having financial knowledge can help counter these difficulties. However, earlier researches have focused on financial literacy and artificial intelligence individually, few studies have investigated the interaction between the two variables that influence investment behavior in emerging economies such as Pakistan. A quantitative method was applied, and 300 Pakistani investors were targeted in order to use a structured questionnaire to obtain the necessary information. The data was analyzed through descriptive statistics, reliability tests, correlation analysis and multiple regression mediation analysis. The findings revealed that both financial literacy and artificial intelligence have a strong and positive impact with investor confidence and investment decision making. The mediating role of investor confidence was also significant enhancing the impact of knowledge and technology on investment outcomes. The results indicate that there is a necessity to enhance financial literacy and provide more convenient AI-powered tools to support investors. The research provides valuable insights for researchers, financial institutions and policymakers who want to enhance financial decision making in Pakistani digital investment setting that is increasingly expanding.

Keywords: *Financial Literacy, Artificial Intelligence, Investor Confidence, Investment Decision Making, Mediation Analysis, Transforming Investment Behaviors, Pakistan.*

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CHAPTER 1: INTRODUCTION

1.1 Background:

Investment decision making is an important process in financial behavior of individuals, companies and institutions. It refers to making decisions in terms of the financial instruments and assets to maximize returns and manage financial risks associated with them. The rational expectations theory has been used to determine investment choices by assuming that people are logical to achieve maximum utility (Markowitz, 1952). This assumption, however, cannot be maintained by growing empirical data of behavioral finance as it has been demonstrated that emotional influence, biases, and knowledge levels have a great impact on investment behavior (Kahneman and Tversky, 1979). Financial literacy and the growing application of artificial intelligence (AI) to finance are some of the factors that have affected such decisions, but have not been thoroughly investigated as a pair.

In general, financial literacy as the ability to understand, interpret and competently utilize financial information to make prudent decisions assists in the determination of individual financial health (Lusardi and Mitchell, 2024). Long-term financial planning, investment, depreciation, budgeting, saving, diversification of risk and interest rate knowledge are some of the skills that are involved in financial literacy. The more financially literate people would be more likely to plan their retirement, to engage in the financial market, or to invest efficiently since they would not fall into the high-cost debt (van Rooij, Lusardi, and Alessie, 2011). Low financial literacy, on the other hand, results in inappropriate investment decisions, reduced wealth-building rate, and increased susceptibility to financial frauds and misguided information (Klapper, Lusardi, and Panos, 2013).

Recent surveys show that most parts of the world especially poor countries have very low financial literacy levels. As an illustration, Klapper, Lusardi, and van Oudheusden (2015) state that financial literacy among South Asia members is 26%. According to the State Bank of Pakistan (2020), most of the population in Pakistan has a low level of financial knowledge that reduces their ability to make sensible investment choices and sabotages efforts to enhance financial inclusion. Financial knowledge against practical investment behavior among Pakistanis still has a huge gap despite efforts made in form of awareness campaigns and financial education programs.

In the meantime, the rise of the technologies of artificial intelligence (AI) has begun to reorganize the whole financial services sector by automating and optimizing many financial activities such as the credit scoring system, fraud detection system, customer care system, and the investment advisory system (Davenport and Ronanki, 2018). Through AI technologies, such as machine learning algorithms, robo-advisors, predictive analytics, and natural language processing tools, financial technologies have dramatically changed the investor-market relationship. The investors can now get real-time information as well as risk assessment and complex portfolio suggestions

that used to be available only to institutional investors (Bhardwaj, Raj, and Jain, 2020). For example, robo advisors apply algorithms to place assets automatically depending on goals, time horizon and risk tolerance of the investor by taking out the need for financial advices from humans.

The impact of AI on modern investing is crucial for the young, tech-savvy people in developing countries. AI systems have transformed the ecosystem by making investing a reality even for people with no knowledge or money due to lower costs, increased accuracy, and reduced bias (Nguyen et al., 2021). As helpful as these technologies are, their effectiveness highly relies on the user's ability to reason and navigate the data provided. In the scenario, an individual with poor financial literacy would not consider the proposals that AI systems generate as valid and helpful, which would significantly restrict their access or result in a low investment performance (Sironi, 2016). Therefore, the less financially literate one is, the higher the chance that they do not make the best use of advanced assistance in investments that is driven by AI algorithms.

The recent interconnection of financial literacy with the emergence of AI technology came with its own cons-and-pros. The silver lining lies on the premise according to which the deficit of financial literacy is going to be addressed through the AI-based automated training and decision-making advice. Individuals who have a greater financial literacy level would tend to demand and question the correct sources more often, process and combine various sources of information in addition to the data produced by AI technologies more often when making investment choices (Dastin, 2018). Thus this leads to the conclusion that not only financial literacy directly influences the choice of investments but also minimizes the impact of AI on the outcome of investments.

The increased application of AI tools on financial markets brings forth new challenges on trust, transparency, and cognitive engagement. It is possible to cite a study in which (Garg & Sharma in 2020) state that AI can provide effective prediction and automation of human error, but the use of AI in the evaluation of risk and uncertainty is not yet fully implemented, as the logic requires a thorough understanding. It is obvious that an increased degree of financial and digital literacy is necessary in enhancing investor confidence that would ensure that technology does not become an obstacle to decision making. In addition, excess AI usage without an adequate grasp of it is morally dangerous, including running algorithms blindly in an attempt to see who will be held responsible and what knowledge is guiding them.

The government of Pakistan has the National Financial Inclusion Strategy, which is rapidly boosting the number of digital financial services, and the high level of smartphone penetration. Commercial banks and fintech companies are rapidly adopting AI in automated wealth management and investment tracking, as well as robo-advisory. The success of such programs, however, is so much reliant on the financial literacy of the user. As an example, the report by the Pakistan Telecommunication Authority (2021) showed that as the number of people having internet access increases, a significant percentage of the population has no knowledge or is not familiar with internet-based investment solutions. This places them in a position where they have access to technology, yet the necessary skills on how to effectively utilize technology is missing.

Investigating how financial literacy and artificial intelligence work together to affect investment decision-making is crucial in light of this. These traits were often studied separately in earlier studies. As an example, (Nguyen et al., 2021) noted the importance of AI in improving consumer financial experiences, but (Lusardi and Mitchell, 2011) found out that financial literacy is connected to stock market involvement. The overlap between the two facets, though, how fiscal literacy promotes or limits the use of AI to make investment decisions is a poorly-understood subject, particularly in less-developed nations like Pakistan.

In addition, investor confidence also now becomes a factor of investment decision making to financial literacy and artificial intelligence. The level of trust that individuals have on their ability to make good financial choices and achieve positive investment returns is what defines investor confidence. It is a measure of the confidence and the safety of investors when they engage in financial markets, especially when using emerging technology like AI-based instruments. Though they might have sufficient financial savvy or have access to intelligent financial systems, in real investor dealing and the quality of their decision making will often be dependent upon their confidence index. With confidence, more active and rational investment is likely to occur but with low confidence, passive reluctance, loss aversion or excessive reliance on others is likely.

Investor confidence can therefore be a connection between financial literacy and artificial intelligence by transforming knowledge and technology into actual action in investment. Since the investors are financially literate they understand the risks and the potential of the decision and thus it leads to the creation of confidence. Similarly, they feel secure in their choices when they use the tools of AI that provide correct data and forecasts. Thus, investor confidence enhances positive effect of financial literacy and AI on investment behavior. By incorporating investor confidence as a mediator, this research can identify the psychological connection that bridges knowledge, technology, and real world financial choices, an aspect of research that has not been given much attention in past studies, particularly in the context of developing nations such as Pakistan.

1.2 Research Gap:

It has been found that many research studies have independently examined the impact of financial literacy on investment behavior (Lusardi & Mitchell, 2024; van Rooij et al., 2024) and the growing influence of artificial intelligence in financial services (Nguyen et al., 2024; Bhardwaj et al., 2025) but only limited research studies have looked at combined effect of these two factors with the mediating role of investor confidence on investment decision making, particularly in developing economies like Pakistan. The literature now in publication frequently approaches AI and financial literacy along with investor confidence as distinct factors, ignoring the potential for interaction or mutual support in influencing investor behavior. Furthermore, (Wamba-Taguimdje et al., 2020) in their systematic review of AI in finance, state that **"**Future research should explore the synergistic impact of digital tools and human financial behavior, particularly in underrepresented regions and demographics**"**. Thus, this study attempts to fill a significant research gap by examining the mediating role of investor confidence on financial literacy and AI-based investment tools on investment decision making in Pakistan.

1.3 Problem Statement:

Many individual investors, particularly in developing nations like Pakistan, continue to make poor investment choices and lack confidence in spite of the growing integration of artificial intelligence (AI) in financial services and the global drive to increase financial literacy (Klapper, Lusardi, & van Oudheusden, 2015; State Bank of Pakistan, 2020). Although AI-powered solutions provide automation and data-driven insights, their usefulness is mostly dependent on the user's comprehension, confidence and use of financial data. Poor financial results could result from lack of investor confidence, investor with inadequate financial literacy misusing or mistrusting these tools (Garg & Sharma, 2020). On the other hand, there is still a lack of actual research on the potential advantages of AI technologies for those who are financially literate.

Thus, the main issue is in the limited understanding on how investor confidence mediates the relation between financial literacy, AI and investment decision making especially in the socio-economic setting of developing nations like Pakistan.

1.4 Research Questions:

- What is the impact of financial literacy on individual investment decision making?
- How does artificial intelligence (AI) influence investment decisions among investors?
- Does investor confidence mediate the relationship between financial literacy and artificial intelligence on investment decision making?

1.5 Aims and Objectives of the Research:

- To study the impact of financial literacy on investment decision making.
- To examine the role and influence of artificial intelligence technologies in affecting investment decision making behavior.
- To assess the mediating effects of investor confidence between AI and financial literacy on investment decision outcomes.

1.6 Significance of the Study:

The increase or the expanding complexity of financial markets is affecting the decision made by investors because of the new technologies such as artificial intelligence. Such a new environment creates the demand to learn about finance, and more to the point, the use of AI. The synergy between the two is one of the factors that are not discussed in the context of a developing nation like Pakistan. With the help of this research, we will be able to make new academic and practical contributions to the audiences, such as, but not limited to, the fintech developers, financial institutions, policymakers, educators, and retail investors.

The paper has scholarly meaning as it contributes to the ever-expanding research on the connection between financial literacy, behavioural finance, and the adoption of AI. Lusardi and Mitchell (2024) and van Rooij, Lusardi, and Alessie (2011) argue that it is highly evident that higher financial literacy is correlated with higher financial achievements, but little effort has been put into exploring this correlation. The role of AI-based technologies such as algorithmic or predictive analytics and robo-advisors in the modern world of investing decision-making has been the focus of a host of other studies (Bhardwaj, Raj, and Jain, 2020). This study aims to seal this conceptual void by exploring how financial literacy is interrelated with artificial intelligence in terms of investment choices and therefore present a more holistic approach to understand the behavior of investors today.

Practically, the research is rather useful to individual investors, especially to the ones who are not so experienced in the market yet who have more access to digital instruments. The threat is growing that investors will be relying on AI technologies without fully understanding the consequences as they become more widely used in retail investing via mobile apps, robo-advisors and algorithmic insights. This may lead to a false feeling of confidence or vice versa, mistrust or lack of familiarity with technology (Garg and Sharma, 2020). This research will make people better informed and more certain investors as it will show that financial literacy can be useful in making successful investment algorithms using AI.

In addition, financial institutions and other fintech enterprises would also benefit by the outcome of the results in the way they structure systems that are more approachable and easier to navigate. The implementation of educational features like lectures, simulations or interactive dashboards may be considered as the incentive to such companies in case it is discovered that the inadequate financial literacy is the key factor that makes people use AI rather limited. The study can also be used by policymakers and regulators particularly in developing countries such as Pakistan where the issue of financial inclusion is a priority. The National Financial education programs of the National Financial Literacy Program of State Bank and the National Financial Inclusion Strategy of Pakistan, among others, are aimed at raising the level of economic involvement through the provision of financial education. Bank of Pakistan, 2020). This research can include evidence-based recommendations of organizing literacy campaigns with the use of digital financial tools, promoting a more equal access to investment prospects. More importantly, this paper will discuss how technology and generational differences are changing

how people act as investors. In the case of financial management, younger people like students and those at the beginning of their careers are turning to mobile platforms and AI-based applications. Nevertheless, studies have shown a big percentage of such users lack the essential knowledge to evaluate financial risk or understand market dynamics (Klapper, Lusardi, and Panos, 2013). The research can be used to achieve the long-term goal of producing a more resilient society in terms of finances and enable the youth in monetary terms by focusing on this group.

Additionally, the confidence of investors is the key to investment behavior because it shows that a person has confidence in their financial decision-making capacity and that they are ready to take some action with financial data. Research has shown that, in case people believe in their financial ability, they tend to engage in long-term, sustainable financial practices and make effective investment choices (Aristei and Gallo, 2021). The lack of such confidence will cause even well-finned persons with strong financial literacy or advanced tools to make poor decisions or make decisions only delayed.

The study can escape a lot of practical importance by adding the investor confidence as a mediating variable in the study. As an illustration, it can help to determine whether the positive effects of financial literacy and artificial intelligence (AI) regarding investment making can only be elicited when the confidence is high. This contributes to making better policy and program designs: in case it is found out that low confidence is a diminishing factor in the efficacy of literacy or AI, then financial education and fintech should aim at enhancing investor confidence as much as knowledge or technology.

Furthermore, the research also helps in achieving some of the sustainable development goals (SDGs) to a large extent such as the research study benefits some initiatives to enhance access to skills and knowledge that are required in making informed decisions by highlighting digital and financial literacy. My study focuses on maintaining the sustainable development goal of Quality Education and sustainable development goal of Work and Economic Growth by evaluating the impact of financial literacy and artificial intelligence on investment decision-making. The research is relevant to the realization of financial literacy as it enables individuals to make systematic financial decisions, which is inherent in the financial well-being sustainability and a healthy economic life. In addition to this, AI can be used in financial decision making and this can facilitate the digital and economic inclusion in developing economies like Pakistan. These changes together with the already present human capital and confidence help promote sustainable economic growth because people are better placed to engage in financial markets.

The importance of this research therefore is that it investigates a pertinent and understudied intersection in the financial sphere. It has also input in SDGs towards improved development in financial choices. Besides furthering the academic theory, the study also provides practical implications of the kind of people, organizations and policy makers trying to adapt to the digital era of finance through how financial literacy influences the adoption and effectiveness of AI in making investment decisions.

CHAPTER 2: LITERATURE REVIEW

2.1 FINANCIAL LITERACY:

Financial literacy can therefore be defined as the understanding; educations as well as the confidence needed so as to make proper decisions regarding finances. Lusardi and Mitchell (2024) describe it as "the knowledge and understanding that enable sound financial decision-making and effective management of personal finances." Other scholars like Akhtar mentioned it as a way of characterizing people's capacity to grasp basic financial concepts and perform personal financial chores, competently. It is vital to grasp in the contemporary world especially in the developing countries, where financial systems are gradually developing. It can also encompass basic ability to count, identify and seize financial opportunities and make plans for the future as well as recognizing and avoiding financial risks (Lusardi & Mitchell, 2011). Specifically, the knowledge of assessing and evaluating the related financial products is valuable when financial literacy is relatively low as in Pakistani case with 13% of the population having a formal banking account according to the Brookings Institution (2017). This gap explains why there is need for intervention measures that may help people particularly the minority and vulnerable groups get financially educated and included.

Financial literacy has been recognized as a core determinant of financial decision making by past shredder. It gives individuals knowledge on how to analyze various tools associated with the financial market, market trends, and make reasonable investment choices.. Those who got financial education are motivated people who are most financially literate, exhibit better financial management and increased future planning than those less financially literate (Lusardi, and Mitchell, 2014). They are also better able to comprehend compound interest, inflation, diversification and risk/return trade-off, all key aspects of making investment decisions.

2.1.1 Interplay between Financial Literacy and Investment Decision Making:

There have been numerous research studies that has demonstrated a positive link between financial literacy and investment decision making behavior. Those who are more financially literate are more likely to practice good investment behaviors, such as having a diverse portfolio and performing long-term financial planning. For example, Lusardi and Mitchell (2007) demonstrated that those individuals who are financially literate are more likely to engage in retirement saving and build wealth. Likewise, Van Rooij, Lusardi and Alessie (2011) found a positive relationship between financial literacy and participation in stock market. Similarly, for emerging economies, the effect of financial literacy among investment decisions is well-traced. A research in Pakistan finds that financial literacy has a significantly greater impact on investment decisions of the investors in Pakistan with parental education and income that contribute to improve their financial literacy (Hussain et al., 2022). Also, studies have shown that financial literacy has a positive relationship with investment decisions in Saudi Arabian context and this relationship was moderated by behavioral biases i.e. overconfidence (Seraj et al., 2022).

The positive correlation between financial literacy and investment behavior is confirmed by more number of empirical studies conducted on the subject across countries. As an illustration, (van Rooij, Lusardi, and Alessie, 2011) got a good fit with regard to financial literacy and Dutch stock market involvement. As an example, the more financially literate people were inclined to invest in stocks and to diversify their portfolios which implies that financial literacy can encourage safe and informed investing. The other important work is that (Nguyen et al., 2016) researched the impact of financial literacy on investment behavior in Vietnam, and the results showed that the higher the level of financial literacy on investment in the formal investment market and rational investment decision-making, the higher the chance of engaging in the formal investment markets.

One such study was carried out by Hussain et al. (2022) within Pakistan and discovered that there is a positive and strong influence on issues associated with financial literacy in making investment decisions, especially among younger individuals or those who are employed. It was established that not only the level of participation in investment increased with an improvement in financial literacy but also the risks of being fooled by financial scams or speculative action were reduced. It was also pointed out in the study that the socio-economic status of an individual including income, educational levels and financial status of parents affect financial literacy in one person and consequently, investment decision. Similarly, (Njoroge, 2013) examined the effects of financial literacy on individual finances of Kenyans and found out that financially literate individuals were found to be good in investment planning, risk management, and budgeting. The research observed that without financial literacy individuals are likely to resorts to hunches or informal personal advice that in most cases causes poor investment choices. This can be compared to (Bahusan and Medury, 2013): the authors conducted research on Indian investors and also found that financial knowledge and awareness positively influenced the mutual fund investment decisions. This is also another testament to the fact that when one becomes financially literate, he/she is able to achieve better financial outcomes as individuals can make informed and wise decisions regarding investments.

Moreover, other behavioral aspects such as overconfidence, risk aversion and herding are seen to be influenced by the level of financial literacy which affect investment activities of an individual. As an example, Seraj, Alzain, and Alshebami (2022) found that in Saudi Arabia, overconfidence affects the choice of investment and financial literacy plays an important mediating role in it. An increase in the financial literacy rate of investors ensured that they were not as susceptible to the unfavorable behavioral biases, thus leading to rational investment decisions. Financial literacy is essential as supported by international organizations like OECD who state that it is very crucial to financial inclusion and economic stability (OECD, 2020).. In addition, The OECD remarks that well-informed investors use their innovations like AI for investment in an appropriate and responsible manner. As CAD tools become commonplace, particularly after COVID, the importance of financial literacy for directing investment decisions increases substantially.

2.1.2 Theory of Planned Behavior:

Moreover, the strong relationship between financial literacy and investment decisions is explained under the framework of the Theory of Planned Behavior (TPB). According to TPB, humans' behavioral intentions are determined by their attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). It also has a direct impact on perceived behavioral control in terms of facilitating knowledge about what to do in an investments options, and in teaching skills for investments. Such increased confidence can have impacts on subsequent financial intention and even real investment behavior. Furthermore, various financial behaviors have been applied by TBP including budgeting, investing and savings. For example, to examine investment decisions, TBP was utilized finding subjective norms and perceived control significantly influenced individual`s investment choices (East, 1993). This facilitates to conclude that a perceived control can positively affect investment behaviors under the influence of financial literacy.

Therefore, there is abundant evidence that financial literacy influences investing choices in developed and developing economies. Not only does it contribute to the involvement in the formal financial system but the quality and rationality of investment decisions is also improved since the impact of biases and misrepresentation is reduced. Besides, due to the increasing complexity of financial products and online interfaces, educators, governments, and other stakeholders interested in promoting economic growth need to make sure that financial literacy should be a priority. Simultaneously, financial literacy silos are in the contribution to the process of investment decisions. This knowledge gap results in more informed decisions and less behavioral bias so as to enhance financial health. The relevance of financial literacy is presented by such concepts as the Theory of Planned Behavior that can explain the influence of financial literacy on investment actions and choices. As the financial markets are changing, it follows that people should be empowered in terms of financial education so as to be enabled to make informed investment decisions.

2.2 ARTIFICIAL INTELLIGENCE (AI):

The artificial intelligence (AI) technology, in contrast to natural intelligence, can be described as the capability of computers or computer-controlled robots to perform general tasks, which are related to entities. Computer-generated robots can replicate the human mode of behavior and thinking (Say, 2018).. According to Kusçu (2015), artificial intelligence refers to the ability of technical gadgets to communicate and perceive via mental processes. Artificial intelligence can also be defined as a device that executes operations via programming to conduct logical and mathematical functions within computer systems. It is a technique that mimics human behavior to build intelligent machines. Artificial intelligence refers to machines that exhibit human-like behavior, thought processes, and decision-making abilities. We don't need to define artificial intelligence because it is already defined as a technological machine that uses programming and algorithms to build machines that operate independently (Karakuş, 2023).

Moreover, the transfer of human intelligence to robots to carry out certain tasks is also known as artificial intelligence technology. Artificial intelligence is meant to be able to reason and complete tasks. Neural networks, deep learning, and machine learning are the foundations of artificial intelligence technologies. In this way, it will be evident that artificial intelligence technology is becoming more and more prevalent in our daily lives and that new software models are being developed on a daily basis. A technical instrument known as artificial intelligence mimics the human brain by performing tasks including problem-solving and human-like thought processes (Wisetsri, vd., 2021).

By pushing the boundaries of machine technology, artificial intelligence has produced a reliable and effective technology. The purpose of artificial intelligence is to increase productivity in the workplace because of its growing demands, not to replace humans. Workload is supported by artificial intelligence, which also guarantees that tasks are scheduled and completed more quickly. Artificial intelligence technology solves a lot of important issues while reducing human error. Artificial neural networks are the most crucial component of artificial intelligence and stand out as an essential component that uses these self-learning and self-developing system networks to make judgements on its own. With analysis and modelling, artificial intelligence technology demonstrates its presence in the investing space and helps investors make the best choice (Think Tech, 2022). By building intelligent devices that mimic human intelligence, AI can be defined as a broad field of computer science. Every business now makes investments in various areas of artificial intelligence technology, which is a technological area that affects every aspect of our lives and is of interest to all sectors, from the financial to the medical.

It is also possible to explain the techniques of AI which are as follow:

The neural network technique is a technical analysis that is based on mathematical models that simulate the functioning of the human brain. In the human brain, they function similarly to neurons. By forecasting and extrapolating event-related data, this technique serves as prediction modelling in the financial industry and helps investors make informed decisions.

Deep learning techniques are a subfield of machine learning that was developed by leveraging preloaded data. The machine learning methodology is continued in this learning method. This method is an analysis tool used in stock data or portfolio management to make data with a very complex structure easier to interpret.

Machine learning method is the method in which the machine obtains information entirely on its own without the assistance of a human. It is described as the process of forecasting a situation by examining the information gathered using this technique and identifying the relevant details. In the financial markets, machine learning is used to anticipate risk, analyze the market for an investment instrument, and help investors make financial decisions (Yildiz, 2022).

2.2.1 Interplay between Artificial Intelligence (AI) and Investment Decision Making:

In terms of artificial intelligence (AI) and investment decision making, investors should not feel pressurized to make accurate investments by facing additional data while trading commodities and stocks in the market because in this scenario, investments are managed by smart machines that possess the capability to think similar to humans, engaging with large data sets and examining information through artificial intelligence and neural network algorithms, enabling investors to choose wisely. Due to the extensive adoption of systems in artificial intelligence technology, investors utilizing this technology maintains its investments by achieving profits in the market setting. In this setting, machine learning allows investors to adjust their investments by identifying intricate investment trends and offering real-time information to investors due to the capabilities of big data processing (Chlu, 2020).

An example of utilizing artificial intelligence technology is of a firm called Kavout which makes daily stock suggestions that will yield the highest returns by ranking the stocks and employing the artificial intelligence system for pricing resolve and pattern confusion. This firm additionally employs artificial intelligence algorithms to generate a portfolio in the similar manner. Epoque, another investment company, created a three-tier artificial intelligence system and constructed the method of examining and evaluating possible investment opportunities in the initial phase, and in the subsequent phase, they developed purchase orders, and in the third phase, the active purchase orders were executed, and a performance analysis was conducted via machine learning, enabling investors to choose the appropriate investment instruments (Thakar, 2020).

Investors can use machine learning techniques to monitor market conditions, investment strategies and data, analyze these data, forecast future investment opportunities, and create their own investment conditions by utilizing artificial intelligence-supported investment applications. This enables investors to make the best possible investment decisions. Without human assistance, artificial intelligence technology continues to function autonomously, learns market trends through analysis, reveals them using sound analysis techniques, and guides investors in making the best choice possible using their reasoning and decision-making skills. By automating their transactions, investors can use artificial intelligence technology to complete transactions more swiftly and give consumers faster, more dependable service (platinum crypto academy.com, 2020). Kavout is an example of a company in the artificial intelligence sector that utilizes AI technology for stock ranking. This firm employs artificial intelligence technology to identify intricate patterns, assess their prices, and suggest the most lucrative stocks, enabling the investor to make informed investment choices. Investors utilize algorithms in artificial intelligence technology to identify the most lucrative stocks for investment, thereby forming a new portfolio. For another instance of a company in artificial intelligence technology, Epoque develops a three-phase artificial intelligence system. In the initial phase, it observes and analyzes prospective investors; in the second phase, it generates purchase orders; and in the final phase, it proactively places those orders and conducts analyses. Performance via machine learning in AI technology. Utilizing deep learning, a subset of artificial intelligence, news from the internet and

information from social media is gathered from multiple sources to evaluate market responses. This involves analyzing historical and trend data to unify insights, enabling investors to be ready for future market conditions in the long term.

At present, the investment volume operated by traditional investors take 10 percent of the total investment volume, as compared to 2012 when it constituted 55 percent of the transactions made in the USA, owing to the development of artificial intelligence technology. Investment robots have performed better than individual investors in handling heavy data, simplifying complex transactions and performing technical analysis since 2000 due to the use of AI technology in incorporation of artificial intelligence in investment, which has resulted in faster investments. Artificial intelligence technology is a field that is receptive to growth. In this manner, by recognizing and rectifying mistakes, it enables investors to invest by offering them straightforward, comprehensible, and clear analytical information. It is understood that investment tools utilize artificial intelligence by allowing serious investors to engage in the financial sector via investment methods in artificial intelligence technology (Walker, 2021)

The combination of artificial intelligence and investment decision making has changed the financial landscape by providing enhanced analytical capabilities and predictive accuracy. There are some theoretical frameworks or theories which explains the relation between investment decisions and artificial intelligence which provides information that how AI technology is utilized to influence investor behavior and market dynamics.

2.2.2 Technology Acceptance Model (TAM):

Davies (1989), created the “Technology Acceptance Model (TAM)”. This theory asserts that new technologies are accepted based on perceived usefulness and perceived ease of use. Considering AI tools in deciding investments, TAM indicates that investors will use AI systems to make decisions only if they expect a positive return and the tools are easy to interact with. For example, AI-powered robo-advisors and trading systems that provide easy to use dashboards and help in managing portfolios significantly increases acceptance from investors. This model demonstrates the importance of designing AI systems that users expect will facilitate adoption in investments and that will easily enhance their capabilities.

2.2.3 Decision Theory:

Another theory “Decision Theory” outlines how a person chooses options with an uncertain outcome. AI impacts that area by offering tools that model complicated systems, predict results, and improve the decision-making process. For example, reinforcement learning algorithms can execute and evaluate numerous investment strategies to different market conditions to find the best one. Such ability makes it easy for an investor to deal with uncertainty and align decisions with their defined thresholds of security and investment objectives (Raiffa, 1968).

Artificial intelligence or AI is, therefore, a technology that allows computers and robots to replicate human behavior. These functions are broad in scope and they require the human intelligence such as reasoning, decision making as well as sorting out problems. Through AI

technologies like machine learning, deep learning and neural networks, human activity is simulated. This enables machines to filter through massive data, discern pertinent trends and make decisions independently. Artificial intelligence enhances the investment decisions through tracking of the market activity and estimating the possible risk and optimalizing the portfolios, e.g., in the case of Kavout and Epoque who rank stocks and automatically trade with the help of AI. The TAM model and the decision theory are two aspects that illuminate the effects of AI technology and can prove that it is affecting the behavior of the investor primarily due to the perception of usefulness and ease of operation. The role of AI in investment management has changed and we cannot rely on the traditional investors anymore. Complex transactions are now made by algorithmic systems. AI will never fail to reduce the errors in which investors make, recommends on the course of action, and hence, provides actionable data required to make significant decisions. It causes the transformation in the monetary world through context with automation and advanced evaluation instruments Results do analytics.

2.3 INVESTOR CONFIDENCE (MEDIATING VARIABLE):

Investor confidence refers to the amount of faith, belief and confidence that the people have in their ability to make the right financial and investment decisions. It reflects the degree of optimism or confidence of the investors towards the market and their skills to make decisions (Baker and Wurgler, 2007). The confidence of individuals concerning their financial information or their indecision to make investing decisions due to uncertainty, fear, or doubt is directly dependent on the level of confidence of individuals. Better-confident investors are better positioned to diversify their holdings, take moderate risks and invest in stock markets (Cupak, 2022). Poor investor confidence though, is more likely to result in inaction, overdependence on the opinion of others, or making decisions based on emotions, which is likely to achieve poor investment outcomes. Various studies indicate that confidence, besides influencing the participation of investors, also defines how the investors perceive and interpret market information (Aristei and Gallo, 2021). Therefore, investor confidence is a psychological process which changes awareness and technological capital into efficient investment activity.

2.3.1 Financial Literacy and Investor Confidence:

Financial literacy enhances the understanding of individual on key financial matters like risk, diversification, and compounded interest. Such improved understanding builds investor confidence because educated investors can better analyze the possibilities and manage financial risk (Seraj et al., 2022).). Put simply, financial literacy provides investors with the ability and confidence to be able to read market signals and make sensible decisions even with uncertainty. Empirical evidence also suggests that economically literate individuals feel more certain about their ability to deliver preferred financial outcomes, and this actually encourages them to invest more responsibly and effectively (Aristei & Gallo, 2021).

2.3.2 Artificial intelligence and Investor Confidence:

Artificial intelligence powered tools, such as robo-advisors and expected financial apps, also increase investor confidence through providing real-time data, automations, and personalized

recommendations that reduce human error and vagueness (Back et al., 2023). However, this is not always a direct relationship; while AI would increase confidence if transparent and easy to use, it decreases confidence when investors find it difficult or unreliable (Verdickt & Stradi, 2024). Thus, the perceived usefulness and trust in AI instruments decide whether they enhance or diminish investor confidence.

2.3.3 Investor Confidence and Investment Decision Making:

Since both financial literacy and AI influence investors' confidence levels, investor confidence is an appropriate mediating variable linking these independent variables to real investment decision-making. Research indicates that knowledge and technology tend to affect behavior indirectly by influencing psychological aspects such as trust, attitude, and self-efficacy (Zhu, 2024). This research therefore incorporates investor confidence as the mediator in explaining the process and mechanism through which and why financial literacy and AI together drive investment decisions. Despite its significance, there has been little empirical examination of this mediating role, especially in developing economies like Pakistan, leaving a useful gap that this study seeks to address.

2.4 INVESTMENT DECISION MAKING:

Investors are individuals who allocate portions of their earnings into investment options like in stocks, commodities, trading etc on their own behalf to generate future income. Some of these investors engage in intentional investments, while others are described as those who attempt to invest in order to manage their own capital sources without possessing any knowledge (Karan, 2011).

A very important element in the basic layout of the market is the private investor. Investors are eager to produce income in the future by investing money in the diverse investment instruments and evaluating their savings in this domain. Investor behavior and personality can be characterized through the nature of investments made by investors depending on their personality traits. But in this case, they unwillingly put their savings at risk by obeying the commands of the environment or their actions connected to the personality characteristics. The aim is to mitigate risk by exploiting applications which give suggestions on investors by means of artificial intelligence technology which would help them invest with wholly accurate data without exposure to the environment, a reason that guides investors not to risk losing their savings (Ozcan, 2011).

The former statement is explained with the help of two terms, namely decision making and investment. Initially, the process of decision making, this term must be differentiated from the term decision. Decisions are selections or perspectives that need to be made after considering various options (Cambridge English Dictionary, n.d.). This term can be perceived not just as a thing (noun) but also as an action (verb) representing a task (Wang, 2015). Schoemaker and Russo (2014) explain that decision-making involves individuals, groups, or organizations arriving at conclusions regarding the actions to undertake while considering a specific set of objectives and

constrained resources. In the meantime, Wang (2015) claims that decision-making refers to the process of selecting the most effective approach to attain objectives while managing limited resources (including both tangible and intangible assets). The other is an investment. The dictionary defines investment as the distribution of financial resources in the shape of real and financial assets with the anticipation of a reasonable return (Banks, 2010). In a similar way, Laopodis (2021) has presented this definition, describing investment as the current sacrifice of resources (time, money, and energy) aimed at acquiring improved or additional resources in the future. Therefore, making an investment choice involves selecting the optimal method to reach the objective of securing future gains with restricted financial resources.

As Ngacha (2019) figures that expense ratio of Chinese stocks market was far beyond normal despite of its less rational structure since stocks' expense ratios was way too higher than that of equity funds on average which might prohibits investors to invest in stocks market (Ngacha, 2019). However, Khan et al. (2018) focuses on the attention of investor towards the probability of measurement of expectations and level of satisfaction towards stocks. It also includes analysis on suggesting techniques that improves present level of perception. This study helps firms in understanding of expectations, needs and requirements regarding to the future and complaints of investors. Researcher in the study has used descriptive type of research design. A structured questionnaire is framed in collection method of primary data. It is a convenient type of sampling method used by the researcher, as data of 204 investors is taken in this study. Several statistical tools for analysis and interpretation purpose which includes Simple Percentage Analysis, Chi Square Test, Karl Pearson's Correlation and One-way ANOVA. Based on the analysis and interpretations, investors can attain wealth maximization when they take correct investment decisions (Bodnaruk & Simonov, 2015).

Business firms are involved in offering variety of investment opportunities to the investors and promising sufficient returns in order to encourage a large pool of investors to make investments (Zahera & Bansal, 2018). Pakistan is not an exception to this global trend of investment, as investors throughout the world are switching towards investment opportunities which are providing higher returns in the form of dividend on consistent basis (Filbeck et al., 2017). Dividend is the return which an investor obtains from the investment he/she has made in certain security (stock, share, bond, etc.) (Ateş et al., 2016; Tuyon & Ahmad, 2016). In general, people all over the world have been investing within such stocks or shares, which are providing higher returns, by considering them preferred source of security investments. Such preference of investors towards the investment opportunities is mainly because of the benefit investors are yielding from such investment opportunities in the form of higher returns (dividend) (De Bortoli et al., 2019). Despite of having the benefit attached to certain investment opportunities, there has been no guarantee of any investment opportunity generating higher returns for investors. Past performance does not guarantee the future performance of any security, as it only provides the guideline to investors about the investment opportunity. Hence, there is always a significant risk attached to investment made even within highly performing investment opportunity (shares, stocks, bonds, etc.) (Koestner et al., 2017).

2.4.1 Investment Decision Making and Financial Literacy:

Investment decisions are an integral part of a person's or institution's finance and are made based on various cognitive, emotional, and technological aspects. Each investor chooses independently based on market experience and available tools, which tend to be influenced by deep-set behavioral biases (Barber & Odean, 2013). EMH and most finance theories predict investors act rationally; however, real life is often characterized by irrational tendencies such as overconfidence and herd behavior (Kahneman & Tversky, 1979). It is noted that those with better financial literacy tend to be more informed regarding the myriad of investment processes such as risk assessment, diversification, and compound interest (Lusardi & Mitchell, 2024). The low financially literate, in their turn, are prone to high fee investments, speculative trading, and swindles (Hastings et al., 2013). Therefore, this demonstrates the role played by financial education in investment.

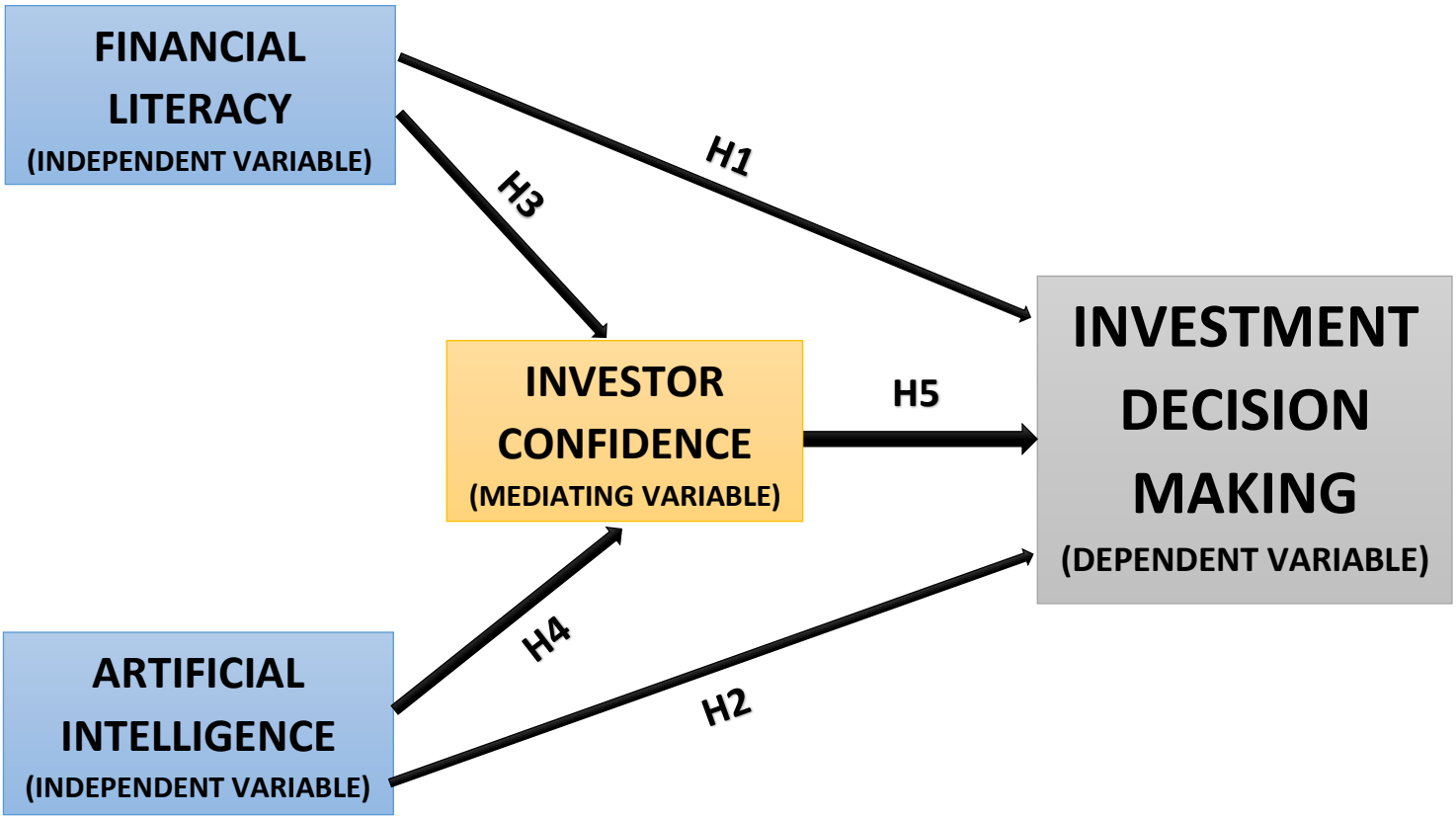
2.4.2 Investment Decision Making and Artificial Intelligence:

The wave of artificial intelligence (AI) has provided a new dimension of decision making in investments. AI-powered tools like robo-advisors and algorithmic trading systems are capable of analyzing large amounts of data and offer personalized advice, outperforming human advisors in cost and efficiency (D'Acunto et al., 2019). Additionally, automating trading reduces emotional impulses such as panic selling while machine learning models can identify trends, measure risk, and evaluate other relevant metrics like panic selling etc. (Bhatia et al., 2022).

Moreover, career traders may also face threats owing to automatic execution of pre-defined trading rules. Investors AI-enhanced portfolio management tools (Bodie et al., 2022) may not be AI integrated due to loss of faith in machines. The "trust gap" (Jain et al., 2020) presents an additional challenge to the adoption of AI. AI also entails algorithms that may be based on algorithms and precedents that incorporate inexplicable biases. Heuristic methods AI may show in decision making can be biased. AI could be better at managing portfolios than humans, yet some analysts prefer humans because of trust issues. Financial literacy determines if a user is able to appropriately interact with AI technology for assistance, as more educated users are more likely to critically evaluate generated recommendations rather than follow them blindly.

The interplay between AI and financial literacy continues to be looked at more closely for the time being. Issues AI can help resolve, from mitigating cognitive biases to improving access to sophisticated financial strategies, are limited to the user's capability to interpret data (Hirshleifer, 2021). AI-user combination appears repeatedly to provide lasting value, which makes the user and AI-powered tools outperform the user and the knowledge alone (Lin et al., 2021). Relying solely on AI may hinder ability to make realistic assessments of decision outcomes, particularly turbulent markets (Bodie et al., 2022). Attention to these issues is bound to shape better AI and investment strategies for new user scenarios within education frameworks crafted by financial authorities and after analyzing firm needs. For the future, researches can be conducted on how different investors demographics like income, age and experiences interact with AI instruments and tools as well as long term effects of AI on financial literacy development and market stability.

2.5 Theoretical Framework:



2.6 Hypothesis Development:

- **(H1):** There is a significant positive relationship between Financial Literacy and Investment Decision Making.
- **(H2):** There is a significant positive relationship between Artificial Intelligence (AI) and Investment Decision Making.
- **(H3):** There is a significant positive effect of Financial Literacy on Investor Confidence.
- **(H4):** There is a significant positive effect of Artificial Intelligence on Investor Confidence.
- **(H5):** There is a significant positive effect of Investor Confidence on Investment Decision Making.
- **(H6):** Investor confidence significantly mediates the relationship between Financial Literacy and Investment Decision Making.
- **(H7):** Investor confidence significantly mediates the relationship between Artificial Intelligence, and Investment Decision Making.

2.7 Chapter Summary:

This chapter examines the literature review on financial literacy, the application of AI, and how they jointly influence the manner in which investments are made with mediating role of investor confidence. The low financially literate, in their turn, are prone to high fee investments, speculative trading, and swindles (Hastings et al., 2013). Therefore, this demonstrates the role played by financial education in investment. The use of technologies such as robo-advisors and algorithmic trading also changed the approaches to investing, increasing the clarity of decisions made as a result of analytics rather than emotion (D'Acunto et al., 2019; Bhatia et al., 2022). There are, however, unaddressed issues like algorithmic prejudice and trust bias (Jain et al., 2020). It is reasonable to expect that the interaction of financial literacy with AI as a technology suggests that investors with solid financial literacy skills are more likely to effectively utilize AI technologies and get advice designed for lower-risk decisions (Lin et al., 2021). Theoretical frameworks which includes Theory of Planned Behavior (Ajzen, 1991), along with the Technology Acceptance Model (Davies, 1989), showcase how financial literacy impacts investment behavior. This chapter has framed the discussion by hypothesizing that financial literacy and AI along with investor confidence as mediator have a positive influence on investment decision-making, which will be empirically tested in the following chapters.

CHAPTER 3: RESEARCH METHODOLOGY

This chapter includes the methodology used for assessing the relationship amongst financial literacy, artificial intelligence, investor confidence and investment decision making. The methodology highlighting the research method and technique has been used for data collection and analysis. Furthermore, it involves details regarding research strategy, research approach, measurement scales, population, sample size, etc. The proposed technique used for assessing the impact of financial literacy and AI with mediating role of investor confidence on investment decision making is outlined within this chapter.

3.1 Research Design:

Research design refers to blue print for data collecting, measuring and analyzing (Mackey & Gass, 2015). In accordance to Flick (2015), research design is defined as a procedure used by researcher for collecting and analyzing important information. This study has used positivist approach for achieving its objectives. Two of the most common research methods used by researcher includes qualitative and quantitative methods (Sreekumar, D., & Sreekumar, D., 2023). Qualitative research is used for utilizing the aim of investigating the subject's emotions. On the contrary, quantitative research is used for determining statistical differences amongst variables. However, this study is based on **quantitative approach** because it has used **primary data** to examine the statistical relation between financial literacy, artificial intelligence, investor confidence and investment decision making. In this study, quantitative research analysis technique is used along with deductive method for assessing the relationship between variables. Quantitative method is used in this study because it ensures reliability and accuracy of the research.

3.2 Research Variables:

In this research study, three types of variables have been considered, mainly "**Financial Literacy"** and **"Artificial Intelligence (AI)"** and these are considered as the independent variables. **"Investor Confidence"** is mediating variable. Whereas, **"Investment Decision Making"** is used as the dependent variable, for assessing its relationship with financial literacy and artificial intelligence along with mediating role of investor confidence in Pakistan.

3.3 Research Philosophy:

Positivism is used as a research philosophy in this study and it originates from the philosophy that champions the idea that reality is out there, clear, factual and separate from the researcher and can be ascertained by means of scientific enquiry. This is advantageous with regard to the phenomena under study on the grounds that this approach works well when used to systematically gather data about and analyze existing phenomena with regards to patterns, interconnections or causality. Positivism pays much attention to the collection of data by using scientific instruments with accurate outcomes. In this study, quantitative approach of research is used, whereby surveys and statistical analysis are used to collect fact-based data of the variables that include the levels of financial literacy, artificial usage, investor confidence, demographic variables, contextual variables, and the extent of investment decision making.

3.4 Research Approach:

This study utilized a deductive approach of reasoning which is useful for testing defined theories and hypotheses in a methodical way. The research incorporates the Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM) alongside concerns AI utilization and investment to explain the relations among AI, financial literacy, investor confidence and investment decisions. The approach is found useful in this case because it allows the researcher to formulate specific hypotheses based on a given theory, gather empirical evidence, and evaluate the data quantitatively in order to validate or invalidate the propositions set out. This aids in ensuring objectivity in the research, while achieving the purpose of the study in producing results that can be generalized based on the sample of investors in Pakistan.

3.5 Research Strategy:

This research is based on survey based strategy which accommodates collection of structured information or data from a broad audience of individual investors. The research study measures the levels of financial literacy, AI tool utilization, investor confidence and decision making in investment as the objectives of the study by using a standardized questionnaire. This strategy gives or enables the researcher to conduct statistical analyses to determine the relations among the variables to be studied, test hypothesis and determine trends in the population as a whole. Through survey method, data collection was time-efficient and it has enabled a broad geographic reach through online distribution via google form which made this type of research highly practical and effective in a developing country context.

3.6 Measurement Scales:

Scales used in research are titled as "THE IMPACT OF FINANCIAL LITERACY AND ARTIFICIAL INTELLIGENCE (AI) ON INVESTMENT DECISION MAKING" requires the use of right measure to operationalize monetary constructs such as financial literacy, awareness and adoption behavior. To measure the respondent's level of agreement/disagreement with statements concerning their awareness of financial literacy, their understanding of usage of artificial intelligence, inclining or declining confidence of investor as well as factors influencing investment decision making, likert scales were used. Such scales make it easier to compare data and increase reliability of data collected across different studies. By converting the qualitative perceptions into quantitative scores, the study enabled quantitative analysis including regression analysis to determine if financial literacy and AI has an impact on investment decision making.

3.6.1 Financial Literacy:

In order to measure the financial literacy of individuals on investment decision making, a scale used by **Thung, C. M., Kai, C. Y., Nie, F. S., Chiun, L. W., & Tsen, T. C. (2012)** which was adapted is used. The scale contains items that examines level of financial literacy, financial knowledge and financial instruments of the respondent. The scale is made up of likert scale questionnaire where respondents have given their responses from strongly disagree (1) to strongly agree (5).

3.6.2 Artificial Intelligence:

In order to measure the role of AI on investment decision making, a scale used by **Gökoğlan, K., & Sevim, H, (2024)** in a study of AI on investor`s decisions which was adopted is used. The scale contains items that examines the respondent`s awareness of artificial intelligence influence on decision making regarding financial investments. The scale is made up of likert scale questionnaire where respondents have given their responses from strongly disagree (1) to strongly agree (5).

3.6.3 Investor Confidence:

In order to measure mediating role of investor confidence on investment decision making, a scale used by **Petrakis, I. (2022)** which was adapted is used. The scale contains items that examines the level of confidence of respondents while making investment decision making. The scale is made up of likert scale questionnaire where respondents have given their responses from strongly disagree (1) to strongly agree (5).

3.6.4 Investment Decision Making:

In order to measure the investment decision making knowledge of individuals, a scale used by **Arpaci, I., Aslan, O., & Kevser, M. (2024)** which was adapted. The scale contains items that examines short term and long term investment strategies of respondents indicating their investment decision making. The scale is made up of likert scale questionnaire where respondents have given their responses from strongly disagree (1) to strongly agree (5).

3.6.5 Demographic Factors:

The demographic variables considered in this study are defined according to common classification that has been adopted in prior empirical studies of financial conduct. Some of these factors are; Gender, age, income, level of education and occupation. These variables are normally captured by self-completion questions whereby respondents categorize themselves into age group, level of education, income range, and type of business or job.

3.7 Questionnaire Design and Measurement Scale:

As a primary data collection tool, a formal questionnaire was used. Five Point Likert scale was used in order to measure the responses which were received by the responses. All variables were calculated by using this scale. Likert scale numbers of anchors includes:

1= Strongly Disagree

2=Disagree

3=Neutral

4=Agree

5=Strongly Agree

3.8 Population:

Data was collected from individual investors as well as financially active adults in Pakistan, especially those utilizing investment tolls or related digital platforms. The population which this study has targeted comprises **university students, young working class adults,** and **self-directed investors** who use online trading services or financial platforms. Respondents were approached mostly via university and social media groups, and email surveys. Since all the participants are based in Pakistan, this was accessible and convenient.

3.9 Sample Size:

Various leading researchers have shared their suggestions regarding sample size selection. For instance, Sekaran (2003) has claimed that a sample size ranging between 100 – 400 is highly acceptable for conducting an appropriate research. Similar to that, Kline (2005) has claimed that sample size of more than 200 respondents is considered as large sample, between 100 – 200 respondents is considered medium, and less than 100 is considered as small. An appropriate sample size is required for conducting an effective research. In the absence of proper sample size, reliability or authenticity of data collected from the respondents might not be considered acceptable. In this study, a sample size of **300 respondents** was finalized for representing the population.

3.10 Data Analysis Techniques:

In order to analyze, data has been taken from the responses which were taken from the designed questionnaire made and distributed through google forms. The data was then coded numerically to treat the Likert scale items as continuous data, a common practice in survey based research to facilitate statistical analysis once the data was collected. Then, composite scores were calculated for each of the four sections of the survey. Specifically, these scores will be the scores of each respondent's Financial Literacy, Demographic factors, Artificial Intelligence Knowledge, Investor Confidence and Investment Decision Making. Each section has averaged the responses in order to provide a more comprehensive and reliable measure of each construct. The tools or the techniques which were used for the analysis are as follow:

3.10.1 Descriptive Frequencies Analysis:

Frequency and percentages were depicted through descriptive frequencies.

3.10.2 Descriptive Statistics:

Mean, standard deviation, minimum and maximum values were depicted through descriptive statistics.

3.10.3 Reliability Analysis via Cronbach`s Alpha:

It is a reliability analysis in order to test the internal consistency of survey items that whether they are reliable or not. (If Cronbach`s Alpha > 0.7, it is considered as acceptable).

3.10.4 Correlation Analysis:

Correlation analysis refers to the statistical test which highlights the magnitude and direction of relationship amongst two or more variables.

3.10.5 Regression Analysis with Mediating Variable:

A multiple **"Regression Analysis"** was used as the principal statistical method for the data analysis after cleaning the data. The selected technique to gauge the effect of the independent variables (Financial Literacy and Artificial Intelligence) along with mediating variable (Investor Confidence) on the dependent variable (Investment Decision Making) using Hayes Process Macro Model 4. Multiple regression is used to examine the impact of the independent variables alone and in combination on the dependent variable with mediating variable holding other things equal. Finally, the most important predictors of Investment Decision Making were identified from the regression mediation analysis, as well as the nature of these relationships.

3.10.6 Data Analysis Software:

In order to analyze the data and perform regression analysis and other analysis, the software which was used was **"SPSS (Statistical Package for Social Sciences)".** This software is an advanced analytical tool that is highly efficient at analyzing complex relationships that involve structural models. Based on its performance and efficiency, this software was highly reliable and was useful for the analysis of this research study.

Overall, the methodology of the research study was aimed to collect proper data on the factors influencing Investment Decision Making in Pakistan through a structured way, to the researcher, it is allowed to test the hypotheses and draw meaningful conclusions, supported with statistical evidence.

CHAPTER 4: DATA ANALYSIS AND RESULTS

This chapter displays the analyzed data and results which occurred. After data collection, all responses were cleaned, coded and analyzed using SPSS software. SPSS was used because it is a reliable tool for handling large datasets and conducting statistical analysis accurately. Various tests are applied, including descriptive statistics, reliability analysis, correlation analysis, and regression-based mediation analysis using the Hayes Process macro. These tools examine the relationships among financial literacy, artificial intelligence, investor confidence, and investment decision making, and to test the study's hypotheses in a systematic and objective manner which is as follow:

4.1 DATA ANALYSIS:

4.1.1 Descriptive Frequencies:

Gender of Respondents

		Frequency	Percent
Valid	Male	179	59.7
	Female	121	40.3
	Total	300	100.0

Out of 300 respondents, 179 respondents having 59.7% were males and 121 respondents having 40.3% were females.

Age Level of Respondents

		Frequency	Percent
Valid	Less than 25 years	56	18.7
	26 to 35 years	186	62.0
	36 to 45 years	52	17.3
	More than 45 years	6	2.0
	Total	300	100.0

Out of 300 respondents, the age of 56 respondents (18.7%) was less than 25 years. Whereas, the age of 186 respondents (62%) was between 26 to 35 years. Moreover, the age of 52 respondents (17.3%) was between 36 to 45 years and the age of only 6 respondents (2%) was more than 45 years).

Education of Respondents

		Frequency	Percent
Valid	Bachelors	98	32.7
	Masters	186	62.0
	PhD	16	5.3
	Total	300	100.0

Out of 300 respondents, 98 respondents having 32.7% have done/doing bachelors. Whereas, 186 respondents having 62% have done/doing masters and 16 respondents having 5.3% have done/doing PhD.

Occupation of Respondents

		Frequency	Percent
Valid	Student	53	17.7
	Employed Full-Time	168	56.0
	Employed Part-Time	75	25.0
	Retired	4	1.3
	Total	300	100.0

Out of 300 respondents, 53 respondents having 17.7% were students. Whereas, 168 respondents having 56% were employed full-time. Moreover, 75 respondents having 25% were employed part-time and 4 respondents having only 1.3% were retired.

Income Level of Respondents

		Frequency	Percent
Valid	Less than 25,000	34	11.3
	25,000 - 50,000	27	9.0
	50,000 - 100,000	120	40.0
	100,000 - 200,000	87	29.0
	More than 200,000	32	10.7
	Total	300	100.0

Out of 300 respondents, 34 respondents having 11.3% were earning income less than 25,000. Whereas, 27 respondents having 9% were earning income between 25,000-50,000. Moreover, 120 respondents having 40% were earning income between 50,000-100,000. Furthermore, 87 respondents having 29% were earning between 100,000-200,000 and 32 respondents having 10.7% were earning income more than 200,000.

4.1.2 Descriptive Statistics:

Variables	N	Mean	Standard Deviation	Minimum	Maximum
Demographic Factors	300	2.09	0.701	1.00	5.00
Financial Literacy	300	3.76	0.861	1.00	5.00
Artificial Intelligence	300	3.73	0.863	1.00	5.00
Investor Confidence	300	3.71	0.833	1.00	5.00
Investment Decision Making	300	3.88	0.780	1.00	5.00

Interpretation:

These findings indicate that the mean score of **Demographic Factors** is 2.09 and the Standard Deviation is 0.70, meaning that there was not much variation in the responses and thus responses were concentrated around lower sides of the scale. The mean of the **Financial Literacy** is 3.76 with a standard deviation of 0.86 as it portrays an average level of financial knowledge with an average variability of the respondents.

The **awareness of AI** has an average value of 3.73 (SD = 0.86), which indicates that the respondents have a positive attitude towards AI on the financial level in general. The mean value of **Investor Confidence** is 3.71 and the standard deviation of the same is 0.83, which shows that overall people are highly confident in the decisions they take when making investments, but there exist differences among the individuals.

Lastly, the **Investment Decision Making** has the highest mean score of 3.88 (SD = 0.78), which indicates that there is a strong tendency of decision making among the respondents, and this is backed with fairly homogeneous responses. The minimum and maximum values are 1 and 5 across the variables, which is a confirmation of the use of a standard Likert scale in the constructs.

4.1.3 Reliability Test Report:

This section presents the reliability statistics for the three key constructs examined in this study. Then, the following constructs were assessed for their reliability using Cronbach's Alpha, an internal consistency measure of the items within a scale. High Cronbach's Alpha values indicate that the items are very similar or measuring the same underlying construct. Primary data collected from 300 respondents was used for the reliability tests.

RELIABILITY STATISTICS		
Variables	**Cronbach`s Alpha**	**N of Items**
Financial Literacy	0.823	6
Artificial Intelligence	0.770	6
Investor Confidence	0.700	5
Investment Decision Making	0.722	6
Overall Scale Test	**0.850**	**23**

- **Financial Literacy:**

  The reliability score of Cronbach`s Alpha for financial literacy scale is **0.823** for 6 items and this indicates strong internal consistency among the items and it means this scale is highly reliable for measuring the construct.

- **Artificial Intelligence:**

  The reliability score of Cronbach`s Alpha for artificial intelligence scale is **0.770** for 6 items and this indicates satisfactory and acceptable internal consistency and means that the item reliably measures the AI construct.

- **Investor Confidence:**

  The reliability score of Cronbach`s Alpha for investor confidence scale is **0.77** for 5 items and this indicates that it meets the acceptable criteria and this scale is satisfactorily reliable for research use.

- **Investment Decision Making:**

  The reliability score of Cronbach Alpha for investment decision making scale is **0.722** for 6 item and this indicates the acceptable internal consistency and means that items can consistently measure the investment decision making construct.

- **Overall Scale Test Report:**

  The reliability score of Cronbach Alpha for overall scale is **0.850** of 23 items and this indicates high internal consistency across all items combined and this means that the overall scale is highly reliable and items collectively measures the broader construct in a very dependable and consistent manner.

4.1.4 Correlation Analysis:

Two variables relationship strength is termed as correlation. Correlation is considered high when the strength amongst the relationship of two variables is on higher side. Whereas, correlation is considered low when the strength amongst the relationship of two variables is on lower side. However, moderate correlation exists in case of moderate strength of relationship existing amongst two variables. Range of correlation-coefficient is between -1 to +1. Pearson r (also known as correlation coefficient) is mostly used for assessing the relationship between multiple variables. The table of correlation between variables Financial Literacy (FL), Artificial Intelligence (AI), investor Confidence (IC) and Investment Decision Making (IDM) is given below:

Correlations

		FL	AI	IC	IDM
FL	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	300			
AI	Pearson Correlation	.302**	1		
	Sig. (2-tailed)	.000			
	N	300	300		
IC	Pearson Correlation	.520**	.235**	1	
	Sig. (2-tailed)	.000	.000		
	N	300	300	300	
IDM	Pearson Correlation	.391**	.441**	.464**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	300	300	300	300

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

Interpretation of Results:

- **Financial Literacy with AI, IC and IDM:**

  The results of the analysis indicate that Financial Literacy has a positive relation with all other variables, showing a low to moderate correlation with AI (r = 0.302), a moderate correlation with Investor Confidence (r = 0.520) and a relatively moderate relation with Investment Decision Making (r = 0.391). These results mean those individuals who possess higher financial literacy tend to use more AI, feel more confident as investors and make better investment decisions.

- **Artificial Intelligence with IC and IDM:**
  These results demonstrate low positive correlation with IC (r = 0.235) and a moderate correlation with IDM (r = 0.441) and this indicates that more use or awareness of AI tools contributes moderately to improved investment decisions making while also enhancing investor confidence.

- **Investor Confidence with IDM:**
  The result of IC with IDM also displays moderate positive relationship between Investor Confidence and Investment Decision Making (0.464) indicating that those investors who are confident are more likely to make better and sound investment decisions.

  Overall, the values of all correlations are statistically significant at 0.01 level confirming these relations are reliable. Furthermore, the results demonstrate that enhancement in Financial Literacy, AI usage and investor confidence are all linked with better investment decision making with most associations falling within a moderate strength range.

4.1.5 Multiple Regression Analysis with Mediator Results:

This regression test was carried out in the form of mediation analysis using Andrew Hayes Process Macro (model 4). It was used to examine the impact of the independent variables alone and in combination on the dependent variable with mediating variable holding other things equal.

- **Analysis between Financial Literacy, Investor Confidence and investment Decision Making:**

A mediation analysis was conducted using Hayes Process Macro (Model 4) to examine whether Investor Confidence (IC) mediates the relationship between Financial Literacy (FL) and Investment Decision Making (IDM) using a sample of 300 respondents.

Path	Predictor	Outcome	β	SE	p-value
a	Financial Literacy	Investor Confidence	0.4669	0.0444	< .001
b	Investor Confidence	Investment Decision Making	0.3157	0.0521	< .001
c'	Financial Literacy	Investment Decision Making	0.2628	0.0468	< .001
c	Financial Literacy	Investment Decision Making	0.3102	0.0423	< .001
a × b	Indirect Effect	Via Investor Confidence	0.1474	0.0348	CI ≠ 0

1. Effect of Financial Literacy on Investor Confidence (Path a):

The first regression examined the impact of **FL on IC**.

- FL significantly predicted IC (β = **0.4669**, SE = 0.0444, *t* = 10.52, *p* < .001).
- The model explained **27.09%** of the variance in Investor Confidence (R^2 = .2709).

Interpretation: Individuals with higher financial literacy tend to exhibit significantly higher levels of investor confidence. The large effect size (standardized β = **0.52**) shows that FL is a strong determinant of IC.

2. Direct and Mediated Effects on Investment Decision Making (Paths b and c')

- Financial Literacy significantly predicted IDM (β = **0.2628**, SE = 0.0468, *p* < .001).
- Investor Confidence also significantly predicted IDM (β = **0.3157**, SE = 0.0521, *p* < .001).
- The model described 24.62% of the variance in IDM (R^2 =.2462).

Interpretation: FL and IC have similar effects in enhancing better investment decision making, though the effect of the standardized effect of IC (β =.3573) is slightly larger than the effect of the standardized effect of FL (β =.2053). This implies that confidence is at the center of literacy translation into meaningful choice.

3. Total Effect of Financial Literacy on Decision Making (Path c):

Before including IC as a mediator:

- FL had a significant total effect on IDM (β = **0.3102**, SE = 0.0423, *t* = 7.34, *p* < .001).
- The variance in the IDM that the model explained was 15.31 percent.

Interpretation: Financial literacy alone has a positive impact in investment decision making. The introduction of the mediator however minimizes this effect which means that the process of mediation is in place.

4. Mediation Effect (Indirect Effect = a × b):

The indirect effect of FL on IDM through IC was:

- **Indirect effect:** 0.1474
- **BootSE:** 0.0348
- **BootLLCI:** 0.0866
- **BootULCI:** 0.2241

Since the confidence interval is not contained around a value of 0, the indirect effect is significant. The entirely standardized indirect effect (.1859) also confirms the power of the mediation.

Interpretation: Financial Literacy is significantly related to Investment Decision Making through the mediation of Investor Confidence. This implies that financially literate people are more assured and the better the assuredness, the better the investment decisions made.

Summary of Analysis:

The mediation analysis gives good support that Investor Confidence is a great mediating variable in the relationship between Financial Literacy and Investment Decision Making. Financial literacy is a direct way to improve the ability of decision making, however, it indirectly improves decision making by increasing investor confidence. This lends credence to the theoretical perspective that psychologically enabled investors, people who believe that they are well versed to make effective investment decisions are in a better position to make positive investment decisions.

- **Analysis between Artificial Intelligence, Investor Confidence and investment Decision Making:**

To evaluate the linkage of Artificial Intelligence (AI) and Investment Decision Making (IDM) on Investor Confidence (IC) in 300 participants, a mediation analysis based on Hayes, PROCESS Model 4, was performed.

Path	Predictor	Outcome	β	SE	p-value
a	Artificial Intelligence	Investor Confidence	0.2665	0.0639	< .001
b	Investor Confidence	Investment Decision Making	0.3372	0.0431	< .001
c'	Artificial Intelligence	Investment Decision Making	0.3524	0.0489	< .001
c	Artificial Intelligence	Investment Decision Making	0.4423	0.0521	< .001
a × b	Indirect Effect	Via Investor Confidence	0.0899	0.0366	CI ≠ 0

1. Effect of AI on Investor Confidence (Path a):

The positive impact of Artificial Intelligence on Investor Confidence was also high (**β = 0.2665**, p<.001).

The model accounted 5.5% variance of IC (R^2 = 0.0551).

This implies that people that find AI tools to be more useful and accessible will have a higher confidence in their investment choices.

2. Direct Effect of AI and IC in investment decision making (path b and c):

In the second stage, AI (**β = 0.3524**, p <.001) and IC (**β = 0.3372**, p <.001) were both found significant predictors of IDM.

The model explained 33.2% of investment decisions variance. (R^2= 0.3321**).** Investor Confidence showed a strong standardized contribution (**β = .3816**), indicating that confidence plays a substantial role in shaping investor`s decision making quality.

3. Total Effect of AI on IDM (Path c):

Before introducing the mediator, AI had a **significant total effect** on IDM (**β = 0.4423**, *p*< .001). This confirms that AI strongly influences investment decisions at the overall level

4. Mediation (Indirect Effect: a x b):

IC had a strong indirect impact of AI on IDM (Effect = 0.0899; 95% CI: 0.0319 to 0.1729).

The fact that the confidence interval does not contain zero proves, this to be mediation.

The second important confirmation of the AI enhancing investment decisions is the indirect standardized effect (**β = 0.0896**), which indicates that AI facilitates investment decisions due to its effect on investor confidence.

5. Summary of Analysis:

- Artificial Intelligence can improve the Investor Confidence to a large extent.
- AI and IC are both important in the betterment of Investment Decision Making.
- AI has a direct and an indirect impact on the investment decision-making process because it enhances the level of confidence among investors in making financial decisions.

Overall, the analysis provides clear evidence that Investor Confidence plays a meaningful mediating role, strengthening the impact of Artificial Intelligence on investment decision making outcomes.

4.2 DATA FINDINGS OR RESULTS:

Hypothesis	Statement	Accepted/Rejected
H1	There is a significant positive relationship between Financial Literacy and Investment Decision Making.	**Accepted**
H2	There is a significant positive relationship between Artificial Intelligence (AI) and Investment Decision Making.	**Accepted**
H3	There is a significant positive effect of Financial Literacy on Investor Confidence.	**Accepted**
H4	There is a significant positive effect of Artificial Intelligence on Investor Confidence.	**Accepted**
H5	There is a significant positive effect of Investor Confidence on Investment Decision Making.	**Accepted**
H6	Investor confidence significantly mediates the relationship between Financial Literacy and Investment Decision Making.	**Accepted**
H7	Investor confidence significantly mediates the relationship between Artificial Intelligence, and Investment Decision Making.	**Accepted**

4.2.1 Reasons of Acceptance:

- **H1: Financial Literacy and Investment Decision Making:**

Result: Accepted.

The results of correlation indicate that there is a positive and significant relationship ($r = 0.391$, $p < .001$).

The findings of regression also verify that Financial Literacy is a significant predictor of Investment Decision Making ($b = 0.2628$, $p < .001$).

Thus, H1 is accepted that is, financially literates make superior investment choices.

- **H2: Artificial Intelligence and Investment Decision Making:**

Result: Accepted.

The correlation analysis demonstrates the existence of a moderate, significant, positive relation ($r = 0.441$, $p < .001$).

Regression confirms a strong direct effect ($\beta = 0.3524$, $p < .001$).

Thus, H2 is accepted, confirming that higher AI awareness and usage lead to better investment decisions.

- **H3: Financial Literacy and Investor Confidence:**

Result: Accepted.

Mediation analysis shows a strong significant effect of Financial Literacy on Investor Confidence ($\beta = 0.4669$, $p < .001$).

Correlation is also moderate and positive ($r = 0.520$, $p < .001$).

Therefore, H3 is accepted, meaning financially literate individuals are significantly more confident as investors.

- **H4: Artificial Intelligence and Investor Confidence:**

Result: Accepted.

Results show a significant positive impact of AI on investor confidence ($\beta = 0.2665$, $p < .001$).

Correlation is also significant ($r = 0.235$, $p < .001$).

Thus, H4 is accepted, demonstrating that greater exposure to AI increases investor confidence.

- **H5: Investor Confidence and Investment Decision Making:**

Result: Accepted.

The results of correlation indicate a moderate positive and significant relationship ($r = 0.464$, $p<.001$).

Regression also confirms a significant effect ($\beta = 0.3157$ and $\beta = 0.3372$ in two models, $p < .001$).

Hence, H5 is accepted, indicating confident investors make stronger investment decisions.

- **H6: Financial Literacy mediates via Investor Confidence on Investment Decision. Making:**

  Result: Accepted.

  The mediation analysis indicates that there is a strong indirect effect (0.1474; the CI does not include zero).

  The direct effect decreased with the addition of IC, which is partial mediation.

  Thus, H6 is accepted, that is, increase in financial literacy enhances decision making in part by raising the confidence of investors.

- **H7: Artificial Intelligence and Investment Decision Making mediated by Investor Confidence:**

  Result: Accepted.

  The impact of AI on the Investor Confidence (Effect = 0.0899) is significant (does not include zero).

  Both the total and direct effects remain significant, proving partial mediation.

  Thus, H7 is accepted, confirming that AI enhances decision making partly by boosting investor confidence.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Discussion:

The purpose of conducting this research study was to investigate the role of financial literacy and artificial intelligence in the investment decision making process in Pakistan and how the investor confidence serves as a mediating variable. The independent variables in this research were financial literacy and artificial intelligence, the mediator was investor confidence and investment decision making was the dependent variable. The respondents consisted of individual investors in Pakistan and the responses were gathered using a structured questionnaire which was shared via google forms. Each hypothesis was tested at a level of significance of 5%. The analysis revealed that the significance of financial literacy and artificial intelligence against investment decision making were less than 0.05. This implies that H1 and H2 were accepted. It was also revealed that investor confidence was positively and significantly impacted by both factors which supported H3 and H4.

Further analysis reported that investor confidence had great impact on decision making when it comes to investing thus accepting H5. The mediation analysis further indicated that investor confidence was significant in the relationships that exist between both financial literacy and artificial intelligence to investment decisions. H6 and H7 were accepted because the indirect effects were significant at 5%. These results demonstrate that more financially educated investors and those who comprehend AI tools better feel confident and thus make better and more active investment decisions. Overall, the findings demonstrate that knowledge, technology and confidence combine or work together to influence the manner in which Pakistani investors make financial decisions.

5.2 Conclusion:

This research study aimed at learning the role of financial literacy and artificial intelligence on investment decision making in Pakistan with the mediating variable being investor confidence. The study was significant as it had filled a considerable gap since previous studies had focused more on these factors independently without investigating their combination especially in a developing country context. The primary goals were to determine whether or not financial

literacy and AI have a direct impact on investment decisions, to determine whether they have an impact on investor confidence as well, and to determine whether investor confidence enhances or explains these relationships. Data was collected using a structured questionnaire of individual investors in Pakistan and the data was analyzed in terms of descriptive frequencies and statistics, reliability tests, correlation analysis and regression-based mediation tests using the Hayes PROCESS model 4.

The findings evidently demonstrated that financial literacy, as well as AI, has a significant and positive influence on investment decision making. They also have a strong enhancement of investor confidence which in its turn contributes greatly towards the determination of investment decisions. The mediation analysis proved that investor confidence is a facilitating thing, that is, financially knowledgeable investors and investors who are compatible or comfortable with AI tools feels much more confident, and it results in a more successful decision making. Each of the hypotheses was confirmed at the level of 5%. Overall, the study contributes to academic knowledge and provide practical insights by demonstrating that enhancing financial literacy and fostering trust of the AI tools in the investors can contribute to improved financial behaviors and financial decision making in a developing digital investment landscape in Pakistan.

5.3 Research Limitations:

There are some limitations of this study that must be kept in mind. The data was collected using a self-reported questionnaire, hence the responses relied on the level of honesty and accuracy with which respondents estimated their own knowledge, trust and utilization of AI tools. The sample contained only 300 respondents and majority of respondents were young, educated individuals and were reached via online resources. Therefore, it is reasonable to assume that the overall findings of the study do not represent all types of investors in the country's market like old investors who lack internet access. Furthermore, the study focused only on few variables like financial literacy, artificial intelligence, investor confidence and investment decision making while other significant factors such as income stability, market conditions, risk tolerance and previous investment experience were not included in the study. Lastly, the study used a cross-sectional design which allows for only one-time retrieval of responses from one sample of people instead of allowing researchers to track investor behaviors over time. This limitation presents excellent

research opportunities for future investigations to expand the sample size, increase representation of different demographic groups, and include expansions of more variables and factors of market conditions, economic influences, and behavior influences.

5.4 Recommendations and Future Directions:

This study has covered major aspects but results can be improved with several recommendations, which can help strengthen future research and promote better investment behavior in Pakistan. Initially, educational institutions and the ones who make policies should offer learning programs, awareness programs and courses to individuals to help them understand financial concepts and digital tools and services. Moreover, companies need to change themselves and provide digital AI apps that can help users understand use of AI in work easily. These measures will build confidence in individuals towards use of technology and will enable them to use modern digital services in modern investments.

Furthermore, in case of future directions, larger and more diverse sample can be employed in research to make sure that results are applicable to various age groups, geographical regions, and level of incomes. In order to have a better insight in the behavior of investors, some add-on attributes can be risk tolerance, digital literacy, or behavioral biases and these would add value as well. As this study only focused on Pakistan, future researchers can compare different countries to know about the effects of these variables in different regions. A longitudinal data will enable the researchers to identify how investment decision and confidence change with time as opposed to relying on one-time responses. To implement significant changes, financial institutions and government officials must focus on strengthening financial education programs and creating easy to use AI-based tools which investors can trust and understand. Such measures could assist the population to make safer, better-informed and easier financial decisions.

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APPENDIX

Research Questionnaire

This questionnaire has been designed for the sole purpose of collecting data regarding thesis; "**THE IMPACT OF FINANCIAL LITERACY AND ARTIFICIAL INTELLIGENCE (AI) ON INVESTMENT DECISION MAKING**". The data collected will be treated with very high confidentiality and it is meant for academic purpose only. You are kindly asked to fill out this questionnaire by selecting appropriate options.

Regards:

MUHAMMAD ABDULLAH TAHIR

Section A: General Information

Gender

1) Male
2) Female

Age

1) Less than 25 years
2) 26 to 35 years
3) 36 to 45 years
4) More than 45 years

Education

1) Bachelors
2) Masters
3) PhD

Occupation

1) Student
2) Employed Full-Time
3) Employed Part-Time
4) Retired

Income

1) Less than 25,000
2) 25,000 - 50,000
3) 50,000 - 100,000
4) 100,000 - 200,000
5) More than 200,000

Section B: Independent Variables

FINANCIAL LITERACY	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can read and understand basic financial information before making an investment decision.	1	2	3	4	5
I have better understanding of how to invest my money.	1	2	3	4	5
I have a very clear idea of my financial needs for future retirement.	1	2	3	4	5
I understand how risk and return are related when choosing investments.	1	2	3	4	5
I understand the difference between short-term and long-term investment products.	1	2	3	4	5
I have better understanding of financial instruments (eg. bonds, stock, T-bill, future contract, option and etc.)	1	2	3	4	5

ARTIFICIAL INTELLIGENCE	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I think that artificial intelligence technology invests in the right investment instruments.	1	2	3	4	5
I think that I will make a profit in financial investment by using artificial intelligence technology.	1	2	3	4	5
Thanks to the algorithms in artificial intelligence technology, I think that complex data is presented to investors in a simple and understandable way.	1	2	3	4	5
I think that artificial intelligence technology is making a difference in the financial investment world.	1	2	3	4	5
When investing, I invest without taking any technology recommendation as a basis.	1	2	3	4	5
I think artificial intelligence technology will shape our investments in the future.	1	2	3	4	5

Section C: Mediating Variable

INVESTOR CONFIDENCE	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am very comfortable when it comes to making any investment decisions.	1	2	3	4	5
I feel confident in using any available AI-based tools or applications to make informed investment decisions.	1	2	3	4	5
I am confident that Pakistani financial market are fair to all investors and offer good long term opportunities for investors with great returns.	1	2	3	4	5
I am confident that Pakistani financial markets are effectively regulated to protect investors from fraud and abusive sales practices.	1	2	3	4	5
I am confident in my ability to make good profitable investment decisions.	1	2	3	4	5

Section D: Dependent Variable

INVESTMENT DECISION MAKING	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
When making an investment decision, I invest by thinking that I have a high level of knowledge.	1	2	3	4	5
I would go for the best possible return even if there is some risk involved.	1	2	3	4	5
I prefer an investment which grows rapidly and provide sufficient return.	1	2	3	4	5
I seek professional or expert advice before making major investment decisions.	1	2	3	4	5
I think investing in different financial instruments for a long time reduces the risk of loss.	1	2	3	4	5
I would prefer making an investment in a firm whose stocks have a consistent record of dividend payments.	1	2	3	4	5

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1st Half Semester Progress Report

Bahria University
Islamabad Campus

RC-04

MBA

1st Half Semester Progress Report

Name of Student(s)	**MUHAMMAD ABDULLAH TAHIR**
Enrollment No.	**01-321242-017**
Thesis/Project Title	**THE IMPACT OF FINANCIAL LITERACY AND ARTIFICIAL INTELLIGENCE (AI) ON INVESTMENT DECISION MAKING**

Supervisor Student Meeting Record

No.	Date	Place of Meeting	Topic Discussed	Signature of Student
1	10-09-2025	Supervisor Office	BACKGROUND AND INTRODUCTION OF THESIS	
2	17-09-2025	Supervisor Office	LITERATURE REVIEW	
3	01-10-2025	Supervisor Office	METHODOLOGY	
4	15-10-2025	Supervisor Office	DATA COLLECTION AND ANALYSIS	

Progress Satisfactory [✓] Progress Unsatisfactory [ ]

Remarks:

Up to Mark Work

Signature of Supervisor: _____

Date: **05-Nov-2025**

Name: **Rabia Umer** Note:

2ND Half Semester Progress Report

Bahria University
Islamabad Campus

RC-04

MBA

2nd Half Semester Progress Report & Thesis Approval Statement

Name of Student(s)	**MUHAMMAD ABDULLAH TAHIR**
Enrollment No.	**01-321242-017**
Thesis/Project Title	**THE IMPACT OF FINANCIAL LITERACY AND ARTIFICIAL INTELLIGENCE (AI) ON INVESTMENT DECISION MAKING**

Supervisor Student Meeting Record

No.	Date	Place of Meeting	Topic Discussed	Signature of Student
5	5-11-2025	Supervisor Office	DATA ANALYSIS AND FINDINGS	
6	19-11-2025	Supervisor Office	RECOMMENDATIONS AND CONCLUSION	
7	10-12-2025	Supervisor Office	THESIS REVIEW	

APPROVAL FOR EXAMINATION

Candidates' Name: **MUHAMMAD ABDULLAH TAHIR** Enrollment No: **(01-321242-017)**

Project/Thesis Title: **THE IMPACT OF FINANCIAL LITERACY AND ARTIFICIAL INTELLIGENCE (AI) ON INVESTMENT DECISION MAKING**

I hereby certify that the above candidates 'thesis/project proposal has been completed to my satisfaction and, to my belief, its standard appropriate for submission for examination. I have also conducted plagiarism test of this using HEC prescribed software and found similarity index at 16% that is within the permissible limit set by the HEC for thesis/ project MBA. I have also found the thesis/project proposal in a format recognized by the department of Business Studies.

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No.	Corrections required (Suggested by Examiners)	Amendments made	Located on Page
Chapter 1			
→	Research Questions and objectives should be aligned	Research Questions and objectives aligned	11
→	Model should tackle the set research questions so. revise the model as per RQs.	Model Revised	24
Chapter 2			
	Literature Review should be systematic instead of just copy pasting the summary of articles.	Literature Review changed into systematic with more references.	14
Chapter 3			
→	Sample size justification should be clearly mentioned.	Sample size justified	29
→	Can AI replace the financial literacy?		
Chapter 4			
	All the results should be presented in APA format, tables should be titled and numbered.	Tables are in APA format and are titled and numbered	31 32 33 34,35 36,38

Page | 2

Chapter 5			
Executive Summary/Abstract			
	Present results in Abstract instead of presenting your model in this section.	Results presented in Abstract	
General Comments			
	Check all the in-text citations.		

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Date: 15/1/26

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→	Research Gap with latest references.		
→	Significance should be brief.		
		→ Research Gap with latest refrences were added.	10
		→ Significance was briefed.	12
Chapter 2			
•	Add latest references	Latest references were added.	14
Chapter 3			
→	This chapter should be in past sentences.		
•	Do not use I, we etc.		
		→ Chapter in Past Sentences	26
		→ I, We were changed	29
Chapter 4			
→	All tables should be in APA style.	→ Tables in APA style.	31 & 32
		→ Mediation Analysis Tables in APA	36 & 38
→	One table for Reliability Analysis.		
		→ One table for Reliability Analysis.	34

Page | 2

Chapter 5			
	Nil Future directions	Future directions were added.	Pg 45
Executive Summary/Abstract			
General Comments			
	Overall the work is	satisfactory.	

Endorsed by,

Dr. Ayaz ul Hassan
Examiner Name

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