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The impact of customizing financial education on university students' financial knowledge and financial behaviour

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The aim of this dissertation is to obtain a doctoral (PhD) degree in the scientific field of Management and Business"

Written by: Ascaryan Rafinda

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DECLARATION

I undersigned Ascaryan Rafinda (date of birth May 2, 1989) declare under penalty of perjury and certify with my signature that the dissertation I submitted in order to obtain doctoral (PhD) degree is entirely my own work.

Furthermore, I declare the following:

- I examined the Code of the Károly Ihrig Doctoral School of Management and Business Administration and I acknowledge the points laid down in the code as mandatory.
- I handled the technical literature sources used in my dissertation fairly and I conformed to the provisions and stipulations related to the dissertation.
- I indicated the original source of other authors' unpublished thoughts and data in the references section in a complete and correct way in consideration of the prevailing copyright protection rules.
- No dissertation which is fully or partly identical to the present dissertation was submitted to any other university or doctoral school for the purpose of obtaining a PhD degree.

Debrecen, 14 March 2022

Ascaryan Rafinda

signature

TABLE OF CONTENT

1. INTRODUCTION

The financial literacy index in Indonesia has increased from 2016 to 2019. A national survey in Indonesian financial literacy found that Indonesians had a 29,6% financial literacy index in 2016, and it has increased to 38,03% by 2019 (OTORITAS JASA KEUANGAN, 2019). Indonesia has a population of 269,6 million people, but only around 102 million people are well literate. It means that from ten people only three people are well literate in Indonesia. Thus, increasing financial literacy becomes one of the national strategic issues in Indonesia.

The United States also have a similar problem in household finance. The Report on Economic Well-Being of the U.S Households found that in 2020 only 40% of households reported just doing okay (4 out of 5 scales of Likert) in their self-reported financial well-being (FEDERAL RESERVE BOARD, 2020). They reported that if they need to spend 400$ emergency cost, approximately 60% will borrow the money from the bank, credit card and friends. This means more than half of the participants did not have any emergency funds. Only 46% will pay the cost from their savings account. This evidence shows that the financial literacy issue is a global problem, not only in the developed countries, but literacy level is also lower in the developing countries. That is why it is essential to examine the financial literacy in Indonesia as a developing country.

Several factors influence personal financial literacy and financial knowledge. Previous research found that family, friends and environment have an essential role in the financial decisions (BOWEN, 2002; CHEN and VOLPE, 2002; NORVILITIS and MACLEAN, 2010; SHIM et al., 2013; XIAO et al., 2011). Other research found that financial education has a role in individual financial literacy and financial behaviour (ALSEMGEEST, 2015; NORVILITIS and MACLEAN, 2010; URBAN et al., 2018). On the other hand, direct exposure to various financial transactions could improve financial maturity, but learning from experience in the major financial decisions is difficult (CAMPBELL et al., 2011).

Family, environment, and friends are factors that are complicated to control. No one has a choice where to be born and with whom, and what kind of environment they are surrounded socially. Exposure to various financial transactions is slow to accumulate and is contaminated by noise (CAMPBELL et al., 2011). A person needs time to experience themselves and face various financial problems to be financially mature. One factor that can be controlled is through financial education. This research will examine the impact of financial education on participants' financial behaviour and their financial knowledge.

Some researchers have proved the advantage of people having financial knowledge. Previous research was found that high financial knowledge has a relation to proper retirement planning (CLARK et al., 2012), saving decisions (JAPPELLI and PADULA, 2013), debt decisions (STANGO and ZINMAN, 2009), mortgage term (DUCA and KUMAR, 2014), credit card behaviour (XIAO et al., 2011), higher household wealth (VAN ROOIJ et al., 2012), explain retirement wealth differences (LUSARDI et al., 2017).

On the other hand, people who lack financial knowledge were found highly related to a poor financial decision (MANDELL and KLEIN, 2007). Some previous research found that poor financial knowledge is related to the inability to plan pension funds, low accumulation of assets (LUSARDI, 2005), problems with debt, foreclosures, personal bankruptcies (OPLETALOVÁ, 2015), excessive borrowing cost and fees (HASTINGS et al., 2010; LUSARDI and TUFANO, 2015), mistakes in choosing investment instruments (VAN ROOIJ et al., 2011).

The results of several studies found that financial literacy was lower in young people (CHEN and VOLPE, 2002; HANSON and OLSON, 2018; LUSARDI and MITCHELL, 2009; LUSARDI et al., 2010; MANDELL, 2008). Young people in higher education are critical as research targets, because they are the generation that will make a lot of big financial decisions in the next 1-3 years. They will face unprecedented financial obligation and financial complexity as they will be independent of their guardians (TANG and PETER, 2015). The college students were found as a risk for poor financial decisions in debt loads from credit cards (LYONS, 2008). The faster the students learn about technical matters in the financial field, the less likely the students will take unwise debt and make various decisions related to inefficient personal financial management.

The previous researcher measures financial literacy using the "big three" measurement, measuring interest rates, inflation and risk (LUSARDI, 2009). OECD in 2018 issued a toolkit to measure financial literacy. They provide three components to measure financial literacy: knowledge, behaviour, and attitude (OECD/INFE, 2018). This research provides a different measurement than previous research as it will measure precisely in four financial knowledge and financial behaviour. The four specific topics measured in this research were financial planning behaviour, saving behaviour, investment knowledge and debt knowledge.

This research will focus on university students in Indonesia who are mostly not exposed to any job experience. They live with their parents or entirely rely on their parents' income to support their studies, and loans for university students in Indonesia are not available yet. This condition gives university students less exposure to financial decisions, and the financial course could boost their knowledge. It will help them to make a sound financial decision as soon as they graduate from university. This research mainly targeted undergraduate students as soon they will become an employee. Starting their own life as employees will make them realise that the money that has been received from their guardian is no longer easily obtained. Someone who faces financial problems, but does not have mature financial knowledge, will risk falling into the wrong financial decision. That is the reason teaching financial education for a university student is the last chance before they fall into a potential problem in their personal finance. This education could help prevent financial disaster such as over debt, budget leakage, fall into fake investment, etc.

One of the critical issues in financial education is about their effectiveness. Prior research has been conducted in financial education and found divergent results (KAISER and MENKHOFF, 2017, 2019; MILLER et al., 2011; GILL and BHATTACHARYA, 2015; SWIECKA and MUSIAŁ, 2018; FAN and CHATTERJEE, 2018; BELL and LERMAN, 2005; BERNHEIM and GARRETT, 2003; COLLINS, 2013; HASTINGS et al., 2013; MCCANNON, 2014; KIM, 2007; LUSARDI, 2003, 2008; WALSTAD et al., 2010). Some studies found that students participated in financial education could not improve their financial literacy (AMAGIR et al., 2018; HUSTON, 2010; ROBB and WOODYARD, 2011). However, some researchers found a strong relationship between future financial behaviour with participating in financial education (BERNHEIM et al., 2001; BHATTACHARYA, GILL and STANLEY, 2016; MANDELL and KLEIN, 2009; MCCORMICK, 2009). There is an effectiveness issue in financial education that need to be examined. Effective financial education is a critical problem worldwide and even more critical in developing countries (FRĄCZEK et al., 2017). This research aims to find an effective way to deliver financial education for a university student in Indonesia.

Some previous research found that financial education has a positive impact, while others found it to have no impact. A research in high school found little correlation between the level of financial knowledge and financial education (JUMP$TART COALITION FOR PERSONAL FINANCIAL LITERACY, 2006; XIAO, 2008). Participation in credit card education was also negatively impacted their credit behaviour (GARTNER and TODD, 2005). On the other hand, it was found that financial education impacts financial awareness and financial attitude in India (CARPENA et al., 2011). The research on financial education for low-moderate income society has found a significant difference in saving and credit behaviour (COLLINS, 2013). The beneficial impact of financial education on financial behaviour is still debatable. There is still room to examine what context financial education could improve financial literacy (HASTINGS et al., 2013).

The summary of the research gap in this research can be seen in Figure 1. It describes the contribution of this research. The main problem of this research is the low level of financial education on youth, then to solve the problem, we need financial education to teach them financial knowledge. The existing financial education literature using one fit for all financial education focuses on numeracy, attitude, and awareness (BATTY et al., 2015; BRUGIAVINI et al., 2015; CARPENA et al., 2015; SWIECKA and MUSIAŁ,, 2018). While much previous research trying to add on another treatment after financial courses such as 1) one-on-one counselling, 2) pay performance, 3) goal setting (CARPENA et al., 2015), and 4) honest money box program (BERRY et al., 2015). They forget to evaluate and develop the financial education itself as the primary treatment. The effectiveness of financial education should be examined first before giving additional treatment after the financial education. One of this research's main contributions is that we identify essential points for the development of financial education, and we develop financial education to increase the impact on the participants. Then this research develops material that fits with the targeted participants. Customised financial education that provides the students financial information and induces their motivation to change their behaviour and teach them a bias in the financial decision is the main contribution of this research. The second gap is the financial literacy measurement, and objective and specific measurements were applied to measure financial knowledge and financial behaviour.

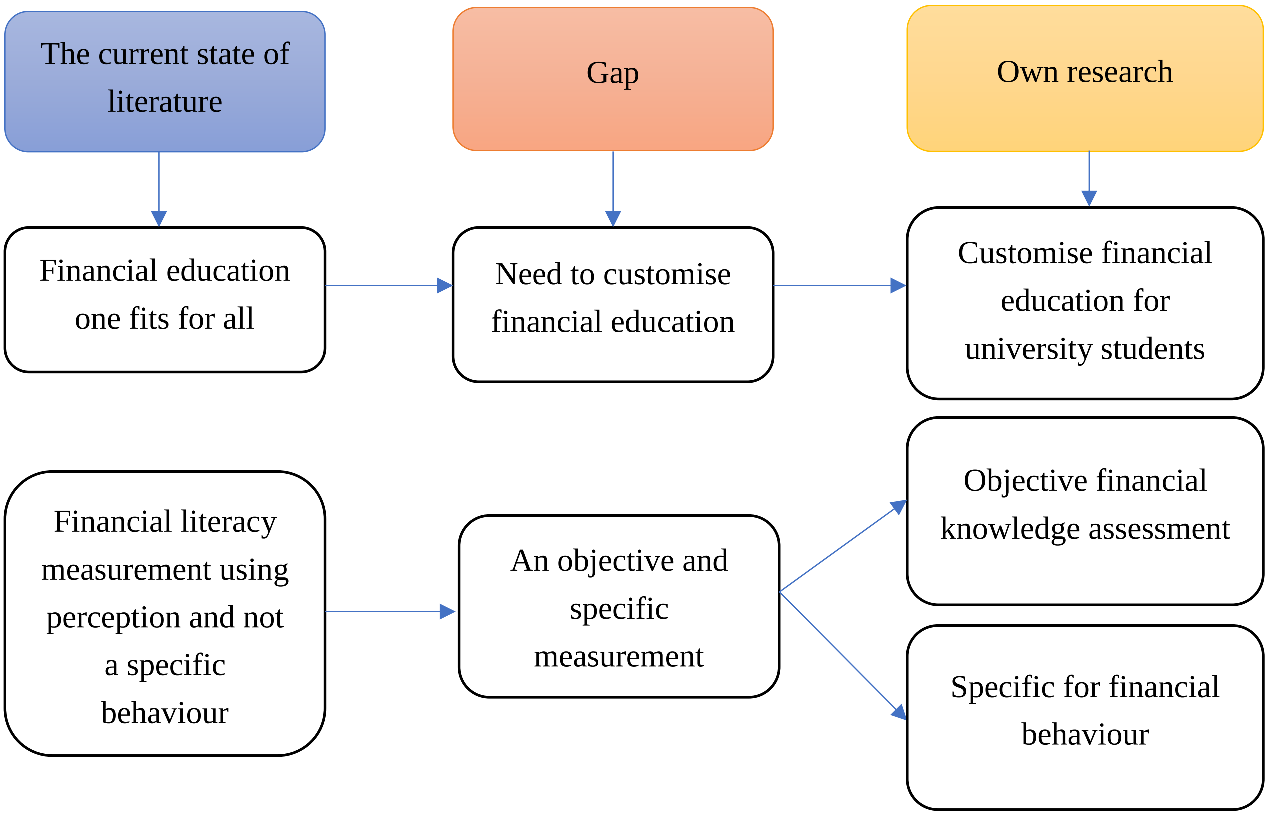


Figure 1. Gap analysis

Source: Author's own construction (2020)

1.1. Research topics

The main problem of this research is that many adults fall in the similar financial problem that previously already happened. An adult's financial problem is closely related to overspending, overuse of credit cards, low income, having no savings account, falling into a fraud investment, having many idle assets, having no idea how to invest, etc. That problem could be solved by teaching them about financial knowledge. Teaching them when they already face the financial problem is not the best way as they need more complex solutions to solve their financial problems. The best way to teach them is by delivering financial education to a group of people below 25 years old. It is assumed that in Indonesia people below 25 years old do not yet face complex financial problems. Preventive financial education is essential to prevent personal financial disasters. The university students are the target group of this research to educate about financial knowledge.

To identify the way to increase effective financial education, this research separated the stages into four parts. In the **first stage**, this research collects adult financial problems, matching them with student expectations about financial education and reconfirms it with an independent financial advisor to identify a well-established financial topic for university students. In the **second stage**, this research identifies the most critical factors to improve the impact of financial education material to the audience. The three critical factors to develop financial education material that has been found were: 1) to tailor it for specific participants, 2) to induce motivation to change behaviour, and 3) to teach them bias financial decision. In the **third stage**, this research develops customised financial education material by using the three most critical factors that will be found in the second stage. In the **fourth stage**, this research examines the customised financial education material that we develop for university students in Indonesia.

This research aims to find out that the customized financial education that we develop could positively impact students' financial knowledge and financial behaviour. To examine the impact of innovative financial education, two measurements were used in this research. These are financial knowledge and financial behaviour. This research uses financial knowledge, as some of their age's specific decisions (debt and investment) are impossible to measure. Less than 10% of the students who participated in this research start their investment, and less than 10% made debt decisions.

1.2. Objectives of the research

As one of the ways out of bad financial behaviour, financial education has a challenge in the effectiveness. The effectiveness is measured by comparing the effort and the outcome. In this research, the effort will be executed with customising financial educational materials. The outcome will be measured by examining students' financial knowledge and financial behaviour.

Several prior types of research have already examined the effectiveness of financial education and found a mixed result. This research aims to examine the effectiveness of financial education for Indonesian university students. This research starts with collecting adults' financial problems, finding the solution, and discovering the best way to educate the young generation (18-22 years old). Then, in the future, the young generation is expected to make a better decision when they face with similar financial problems.

This research aims to develop effective financial education for university students and examine its impact by assessing their financial knowledge and financial behaviour as the outcome. The first stage of this research is to collect the financial problems from the adults' perspective and to collect student perception of financial education. Previous studies suggest that financial education material consisting of previous financial mistakes is essential, because it is developed based on actual personal experience (CHEN et al., 1998). In the first stage, this research also collects student expectations in financial education. This data is important, because it contributes to understand student expectations about financial education. Then by collecting adults' financial problems and student perceptions, it will contribute to the development of financial education material fitting in with their need and expectation. Not only that, but this research also reconfirms the findings from adult financial problems with an independent financial advisor. The independent financial advisors suggest several financial cases that should be discuss in the financial education material for the university students. The first stage this research collected using triangulation data. We mixed quantitative data from questionnaire and to gather richer data in-depth interview has been done with financial advisors. We match the adult financial problems, student expectations and financial advisors' suggestions to identify the most important topics of financial education to learn for university student.

The second stage is identifying the most important factor to develop financial education material. In this research literature review of previous research in financial education and some financial behaviour theories were applied to understand how people change their behaviour and how people make financial decision. The second stage's outcome was finding three most important factors in developing financial education material. The third stage is developing customized financial education by using literature review and analyses from the first stage. The outcome of the third stage was to create the customized financial education material based on the critical factors. The fourth stage was testing the customised financial education. This stage was examined by using the experimental method. The students participated and evaluated for a certain period of research time frame. Then the result is evaluated at the end of the research period.

1.3. Research questions

The main research question in this research is how to develop more impactful financial education material for the audience? To answer this question, the researcher breaks it down into several questions as it needs several stages to answer the main question. At each stage one question should be answered that becomes the pillar to answer the main research question. Previous research focuses on examining the impact of existing financial education material; previous researchers rarely develop customised financial education. This research contributes by discovering critical factors to increase impact of financial education material to the audience, developing material that used these critical factors and test the material to the specific participants.

Previous research reports that no one fits all financial education for everyone (MAURER and LEE, 2011; OECD, 2019). They claim that financial education should be customised, fit their age and timeliness (FERNANDES et al., 2014). Then the urgency to identify customised financial education is crucial to increase the impact of financial education. Customised financial education in this context means that each age needs a different topic to be discussed and understand. For example, 45-50 years old people need financial education that focuses on retirement preparation. While some people who plan to get married soon, they need financial education material that discusses financial education for marriage preparation. People that already have a kid also need different financial topics to learn. They need to understand financial aspects for kids' education. Each stage needs a different and customised topic to be discussed. The main idea of the first stage of data collection is to find out the important topics to teach for university students. Based on that idea, **the first research question is: What is the most suitable topic in financial education for a university student?**

In the next stage, this research formulates several factors to increase the impact of financial education by focusing on the development of financial education material. In this stage, excessive literature review has been executed to find a factor that could increase the effectiveness of delivering financial education. Previous research claims that financial education needs to be customised and fit for the age of the participants (COLLINS and O'ROURKE, 2010; FERNANDES et al., 2014). However, not much previous research develops and design the financial education that fitted and customised to university students. In this stage, the researcher needs to find the important factors to develop customized financial education. This is important, because many previous financial education materials only focusing on the numerical skills, mathematical things, and cognitive aspects. They mostly deliver information about basic finance. While the generation Z need more than delivering information in the financial education. **Then the second research question is: What is the critical factor needed to develop financial education material that fits for university students?**

The last question of this research is to test whether the customised financial education could be effectively delivered to university students. At this stage, we need to understand if the customised financial education material that we developed could be effectively delivered to the student or not. To be able to examine the impact, in this last stage we need to develop the material and tested it using experimental design. Two research stages have been done to answer this last question. Based on that argument, **then the last question of this research: Does the customised financial education material could effectively be delivered to a university student?**

1.4. Research approach

To answer the research questions, deductive approach was applied. First, literature review was done to identify the research and phenomena gaps. The next step was to search for theories that could help to address the problem. The next stage is data collection and analysis to find out the answer and verification of the theory. Figure 2 shows the research approach used in this research.

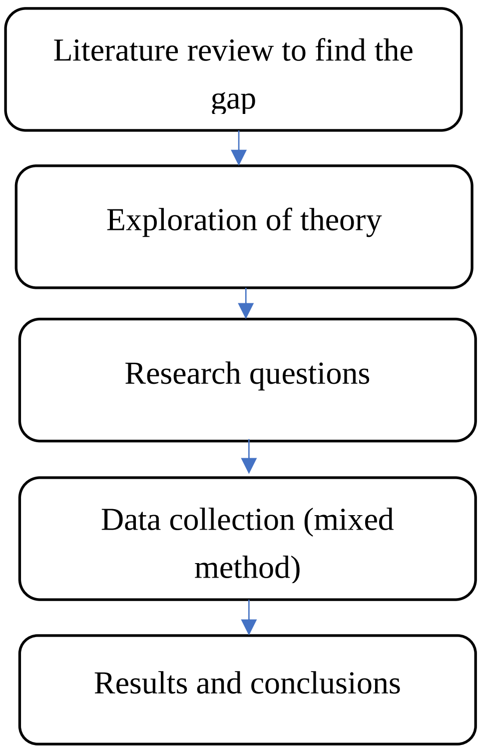


Figure 2. Research Approach

Source: Author's own constructions (2020)

This research aims to develop and test a customized financial education material. To reach the aim, this research needs to answer three research questions by using four stages as described in Figure 3. The first stage aims to identify the most important topics of financial education for university students. The second stage aims to identify a critical factor in developing customized financial education materials. In the third stage, this research develops customized financial education materials. The fourth stage aims to test the customized financial education materials that this research develops. In each stage different data collection method was used. In the first stage questionnaire and interview were applied to different participants. In the second stage literature review was executed to identify critical factors to develop financial education material. For the third stage needs literature review and data from the first stage are needed. In the fourth stage experimental method was used to test the customised financial education materials.

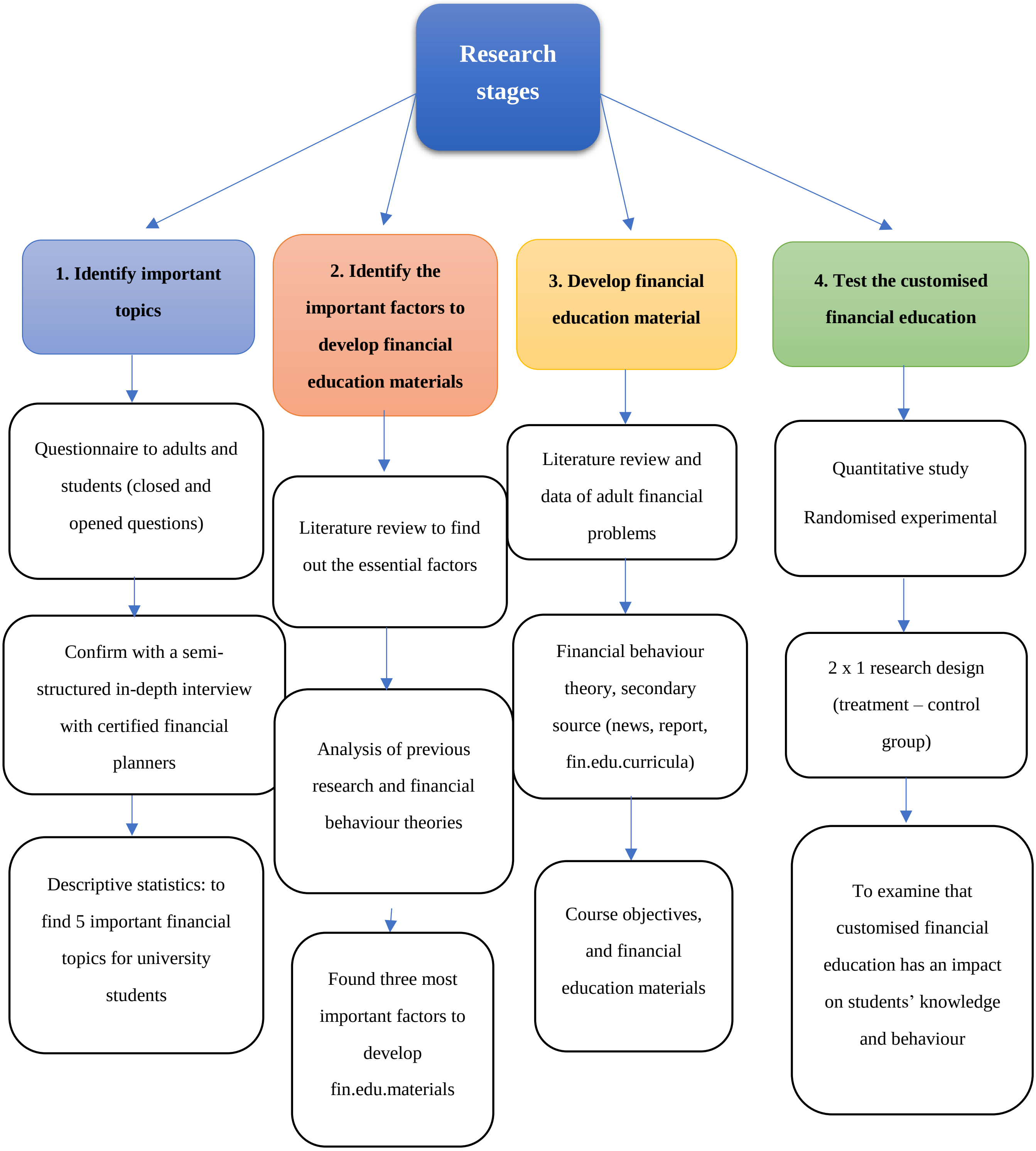


Figure 3. Research Stages

Source: Author's own construction (2020)

2. LITERATURE REVIEW

This section reviews previous studies in financial education and theories which were developed on financial education and financial behaviour. Financial education has become a more critical role in recent years. Governments, financial institutions, and education institutions promote the favourable impact of financial education (OPLETALOVÁ, 2015).

2.1. Urgency financial education in Indonesia

The latest report from the Indonesia Financial Advisory calculated that in the last 10 years (2011-2021) Indonesia already suffer 117 trillion Indonesian rupiah or losses about 72 million Euros from fake investment (SAFITRI, 2021). The scheme of the fake investment mostly applied the old way Ponzi scheme, but right now they use financial technology and application to deceive people. Not only fake investment, but there are also a lot of fake financial technologies offering people with easy credit without collateral with the consequences on the high interest. These fake financial applications mostly use peer to peer lending that collects money from investors and lend the money to the borrowers. In this scheme people with low-income families tend to use the illegal online lending to easily get the money. Then they realize after several months, the online lending platform charges them with huge interest which makes them suddenly burden with a huge debt. The scheme evolving month by month, the most current cases are fake trading applications. Until now, the total loss for the fake trading applications are still unrevealed and reported that they lost 2,4 billion Indonesian Rupiah or 150.000 Euros (PRANSUAMITRA, 2020).

The victims of this fake financial investment is like an iceberg. A lot of people do not speak up and report their losses in financial applications. In the last three years (2019-2021) Indonesian Financial service authority received 19.711 reports of illegal online lending (OJK, 2021). These only reports on illegal online lending, while the business model of financial technology is still improving. Right now, the existing financial technology that is used widely in Indonesia is in a form of crowdfunding, microfinancing, P2P lending, digital payment system, trading, and investment, etc. While the business model is evolving rapidly, the report of illegal practice is still limited in the P2P lending.

This illegal practice is spreading fast because of the instant mental from the society. The high demand from the low-income families to have easy money is one of the reasons why the illegal fintech improve rapidly, in fact, they have lack of financial literacy (OJK, 2021). This situation made them fall into credit and trap poverty, because their income was allocated for the loan interest. In addition, this behaviour will lead to the burden of their debt into their children. This is one of the reasons why Indonesians urgently need to improve their financial knowledge. People need to become financially well-literate to prevent them falling into a financial disaster.

People's financial behaviour could be change in a several ways. Friends and family has an important role on our financial behaviour (BOWEN, 2002; CHEN and VOLPE, 2002; NORVILITIS and MACLEAN, 2010; SHIM et al., 2013; XIAO et al., 2011). Direct exposure to various financial transactions also could improve financial maturity, but learning from experience in the major financial decisions is difficult (CAMPBELL et al., 2011). Other research found that financial education has a role in individual financial literacy and financial behaviour (ALSEMGEEST, 2015; NORVILITIS and MACLEAN, 2010; URBAN et al., 2018).

Family, environment, and friends are all difficult to control. Nobody can choose where they are born, who they are born with, or what sort of social environment they are raised in. Exposure to a variety of financial transactions accumulates slowly and is influenced by a lot of noise (CAMPBELL et al., 2011). To become financially mature, an individual must gain experience and confront a variety of financial difficulties. One variable that could easily be controlled and everyone has the same chance is through financial education. We will discuss the current issues in financial education research in the next sub-chapter.

2.2. Previous research in financial education

In this part, previous research will be examined to identify their strengths and their limitations. The previous research discussed here is limited to research that conducts financial education directly and examines its impact to the participants. To examine previous research, we will focus on the topic that they teach on financial education, the design of their experiment, and how to measure the outcome of financial education. In this part, we focus on how they design the research and the methodology of the research. Table 1 shows the summary of the previous research.

Table 1. Summary of financial education research

Authors	Research Method and Experimental Design
SWIECKA et al., 2018	• Pre-post questionnaire (1 week before treatment and 1 month after treatment) • Different questionnaire but its claim closes to each other. • Subjective measurement financial knowledge and assessment of investment attitude • 30 minutes one time course • Topic coverage: Compounding Interest, Inflation, and risk diversification. • Treatment group got basic economic concept and control group did not get it. • Sample: 185 Poland 2013/2014, 679 Italy 2015/2016,
CARPENA et al., 2015	• Three kinds of financial knowledge: Financial Numeracy, Financial Awareness, Financial Attitude • 5-week high quality financial education video to low-income family @ 2 hours / week. Plus, additional treatment: pay-per-performance, goal-setting, one-on one counselling • Topic coverage: Budgeting, Saving, Credit, Insurance • Treatment group got financial education video, control group got health training video • 1300 urban poor households in Ahmedabad
BRUGIAVINI et al., 2015	• Objective (actual financial literacy 3 questions in "Big Three" and investment attitude 3 questions) and subjective measurement (perceived financial literacy 1 questions) • The design is laboratory and field experiment • The topic coverage is basic financial concept: interest compounding, inflation, diversification. Explain about patience, Interest rate, Present and future value, Inflation, Concept of risk. • Treatment group: Small-scale group learning basic financial concept and the control group: learning history of the venetian lagoon • 679 participants from university students in Italy
BATTY et al., 2015	• Field experiment: 5 weeks in class financial education intervention @ 45 minutes using Council for economics education financial fitness for life (FFFL)

Authors	Research Method and Experimental Design
	• Outcome measurement using financial knowledge, behavior and attitudes. • The topic coverage: Saving, Financial Decision Making, Money Management. • Treatment group: got education while the control group did not get education • The sample: elementary school students in fourth and fifth grades
BATTY et al., 2016	• Experiential teaching method for financial education using MCE (myclassroomeconomy.org), students got involved all activities in the school to certain amount of monetary unit, whether they reward or punish then they will get money / get fined. • Outcome measurement: Student perception on Financial Knowledge, Financial Behavior, Financial Socialization, Economic experience outside school, Parent perceived of student behaviors: Bank account, manage money, learn money at school. • Topic coverage: Financial knowledge, Budgeting, Propensity to plan, Self-control, Financial Socialization and Economic Experience • Sample: 24 schools: 15 schools in treatment group, 9 schools in control group with total 1972 students
BECCHETTI, et al., 2013	• Randomize experiment in 16 hours financial and examine the impact on portfolio investment. Pre-post questionnaire. The post-test held 4 months after. (The experiment takes 3 months meeting) • Outcome measurement: The changing in portfolio Investment with virtual investment (investment behaviour), financial literacy questionnaire, • Topic coverage: 1) Basic concept of economics, 2) Economic operators: households, companies, and banks, 3) Debt, indebtedness and financing, 4) Monetary policy and the monetary institutions, 5) Financial markets, 6) Finance and ethics • Control: interview pre-post; Treatment: Course in finance (16 hours) and interview pre-post • The sample 994 students in 36 high school classes in Italy
BERRY et al., 2018	• 9 months of two financial education curriculum + a locked saving box • Outcome measurement: Self-reported saving • Topic coverage: Saving and social aspect using Aflatoun curriculum (saving and social) and honest money box • Sample: primary and junior high schools
DOI et al., 2014	• Two days of financial training that examine migrant workers and their family. Four groups consisting of: 1) migrants only, 2) families only, 3) migrants and families, 4) control group. The training is participative, applied and interactive. • Outcome measurement: Self-reported outcome on financial knowledge, behavior, and household outcome: Spending and saving behavior and Family financial communication

Authors	Research Method and Experimental Design
	• Financial management, financial communication within family, Bank service, saving, debt management, sending remittance, insurance. • Treatment group received financial training, while the control group got no financial training. • The sample: 400 migrant workers and their family members in Indonesia
JOHAN et al., 2020	• 14 weeks personal finance education course in Indonesia • The outcome measurement: financial knowledge, attitudes, and behavior • The sample: 521 university students in Indonesia • The topic: 1) concept of personal finance, 2) financial planning, 3) budgeting and cash flow, 4) managing income tax, 5) tools of money management, 6) time value of money, 7) loan and credit card, 8) purchasing vehicle and housing, 9) managing risk and insurance, 10) health insurance and life insurance, 11) principal of investment, 12) investment in financial asset, 13) investment in real asset, 14) retirement plan

Source: Author's own work (2021)

In summary, objective outcome measurement is essential in financial education research as it could reduce the possibility of social desirability bias in high culture society. To reduce the potential Hawthorne effect in the experimental research, both the control and treatment groups should get the course with different materials. The material and outcome measurement should be fit then we will understand if the education material has an impact on the participants. The topic should be fit in with the participants. High school students do not yet need to learn debt and investment as it is far from their daily life. This fitness topic will differ in each country as they have different cultures and financial decisions on their ages. Besides criticising previous financial education research, some financial education research also has suggestions and recommendations to increase the impact of financial education. In the next stage, we will discuss on how previous researchers examined financial education using meta-analysis and what we can learn from them.

2.3. Meta-analysis research on effective financial education

The effectiveness of financial education also interests some researchers to examine the topic using meta-analysis. Most researchers on this topic evaluated and criticized the current financial education. They were doing a systematic literature review to evaluate the impact of financial education. The first meta-analysis research examines the effectiveness of financial education. They found that financial education only has a modest effect (FERNANDES et al., 2014). The opposite result found that targeting and discussing specific financial behaviour as the material in financial education has an essential role in increasing the effectiveness of financial education (MILLER et al., 2015). More specific findings in this meta-analysis found that debt behaviour is the most difficult to intervene in financial education. Low-income families were found less effective when receiving financial education (KAISER and MENKHOFF, 2017). More studies in meta-analysis found that financial education has a sizeable impact on financial knowledge and a more negligible impact on financial behaviour (KAISER and MENKHOFF, 2019).

Besides the critics, there are several recommendations from previous research to improve the effectiveness of financial education. One of the results from meta-analyses of financial education found that the impact of financial education only plays 0,1% to the financial behaviour or financial knowledge (FERNANDES et al., 2014). They predict some reasons why financial education has a low impact on participant knowledge and behaviour: 1) low expertise of the teacher, 2) they only teach normative behaviour, 3) they face unusual competition with inexpert advice that have "share of voice" (FERNANDES et al., 2014). Another researcher suggests that teaching soft skills, such as propensity to plan and willingness to take a risk, is more important than teaching basic financial knowledge such as compound interest, inflation, present value calculation, etc. (HADAR et al., 2013).

Financial education could be more effective when teaching with a practical exercise, motivating participants and working together in a group (PEETERS et al., 2018). A practical example is critical, as it will reduce participant effort to shifting from understanding the knowledge into the actual behaviour. Giving students the example that is easy to mimic is vital in financial education, but people need more than sound knowledge. It is commonly believed that financial education could improve participants' knowledge (LYONS and NEELAKANTAN, 2008), but still insufficient to shifting from financial knowledge into financial behaviour (HAWKINS and

KIM, 2012; KENNEDY, 2013). Participants need to be motivated to transform their knowledge into healthy financial behaviour (BURK, 2011; XIAO et al., 2014). Then inducing motivation in financial education is essential, as it will help participants to shift their current behaviour into better financial behaviour.

As a summary, based on the meta-analyses of financial education research, they found that current financial education is not yet effective, teaching debt is the most difficult material and low-income families are one of the most difficult segments to teach financial education. Besides that, some researchers suggest to improve the effectiveness of financial education, the material should be practical, motivate people and give them an example that is easy to mimic.

Understanding existing financial education curricula is essential. It could help us understand what the current financial education curricula is. In the next sub-chapter, we discuss the advantages and disadvantages of current financial education curricula.

2.4. Existing financial education curricula

US non-government organisations developed many financial education curricula. Unfortunately, only a few of them have been examining the impact empirically by researchers. This section presents some of the financial education curricula that are commonly used and tested empirically by researchers. The financial education curriculum is available mainly from the United States. The Jumpstart coalition collects all-volunteer financial education to discuss and develop financial education curricula in the United States. Here are some of the empirical evidences of previous research that examine the current financial education curriculum.

The first curriculum is “financing your future”, which was developed for high school teachers to use with their students in the US. They developed five video materials that contain: 1) fundamental concepts in personal finance (saving, wealth, money management), 2) trade-off and opportunity cost on a financial decision, 3) the importance of banking relationship, 4) credit and debt, 5) budgeting, saving, investment and risk tolerance (WALSTAD et al., 2010). The second curriculum is Aflatoun. The program was developed by an international nongovernmental organisation (NGO). They developed school-based curriculum for financial education. Currently, this program has already been implemented in more than 100 countries (BERRY et al., 2015). Aflatoun develops the idea that students at school should not learn only financial skills, which could value everything in a monetary unit for them. Then Aflatoun mixed financial education, social education and school saving club. The social education teaches the students about their character and motto, understand personal and how to explore their skill, they learn rights and responsibilities. The financial education part of Aflatoun material explains the Honest money box program. The third curriculum is the Honest Money Box (HMB). That program is adapted from the Aflatoun program, which is developed by Ask Mama Development Organization (AMDO) and Innovation for Poverty Action (IPA). The HMB program focuses on the financial aspect of financial education. They focus on educating the students to have a savings account. They learn about money, saving and spending, understanding the money box, and learning planning, budgeting, and entrepreneurship. The Aflatoun and HMB program was developed specifically for high school and junior high school students in the United States. At the same time, this research contributes to the development of financial education for university students, especially in Indonesia. There are two current research that aim to examine the impact of their financial education curriculum in Indonesia.

Financial literacy for the migrant workers has been examined in Indonesia by several researchers. They train them for 18 hours covering six modules: financial management (financial planning, budgeting, discussing with family before the departure of migrant working overseas), understanding banking services (how to use a bank account, ATMs, and other products in the bank), saving (the importance of saving, saving option), debt management (source of loan option, calculating interest rates), sending remittances (way to remit, exchange rates), understanding insurance (migrant insurance) (DOI et al., 2014). The financial education that they develop for migrant workers using participative and interactive methods with participants, and they teach practical knowledge that is easy to apply. They were also using games, discussion, assignment, experience sharing to engage with participants. This financial education for migrant workers already develops material that is customized to fit in with targeted audience.

Financial education for a university student in Indonesia is still rare. Only a few universities apply this education voluntarily as part of the course at the faculty of economics and business. One of the universities that applied and examined the impact of the course is Bogor Agriculture University (JOHAN et al., 2020). The personal finance curriculum design for the university student consists of 14 weeks consisting of three hours of meeting each week in the class. The 14 week meeting involves 1) the concept of personal finance, 2) financial planning, 3) budgeting and cash flow, 4) managing income tax, 5) tools of money management, 6) time value of money, 7) loan and credit card, 8) purchasing housing and vehicle, 9) managing risk and insurance, 10) health insurance and life insurance, 11) principle of investment, 12) investment in a financial assets, 13) investment in real estate, 14) retirement plan (JOHAN et al., 2020). This IPB personal finance curriculum is broad enough for university students. They teach student investment in financial assets and real estate, which is still far from their decision. Students need micro-investment that is easy to execute for university students. That research also did not explain the value beyond the content of the material. While previous research suggests participants need more than information, they need soft skills (HADAR et al., 2013) to make better financial decisions. To the best of the author's knowledge, currently, there is no available well-developed financial education in Indonesia, especially for university students.

2.5. Theory of financial behaviour

The theories of financial education and financial behaviour are still developing. Currently, there are three theories that most people use when they research financial behaviour. There are the transtheoretical model change (TTM), the theory of planned behaviour (TPB) and the self-determination theory (SDT). These three theories explain how people could change their behaviour. People use it to identify the pattern of how people change their behaviour in finance. Here are the details of each theory:

1. The transtheoretical model of change (TTM)

   People will have four stages in behavioural change, and this model has been developed by PROCHASKA and VELICER (1997). The TTM was first commonly used in the field of medical behaviour. Some health behaviours include quitting smoking, stopping overeating, starting exercising, stopping alcohol abuse, etc. There were four stages for people to change their behaviour:

   a) Precontemplation is when people do not realise that they need to change their behaviour. People are in this stage, because they are uninformed about the consequences of their behaviour. Maybe they have already tried to change several times and become demoralised in their ability to change (PROCHASKA and VELICER, 1997). People have to be educated that something terrible could happen when persisting on that behaviour in this stage. The education could increase their awareness about their financial condition.
   b) Contemplation is the condition of people that they have an intention to change their behaviour in the next six months (PROCHASKA and VELICER, 1997). They realise they have a problem because of their behaviour. People in this stage are sometimes caught by procrastinating (PROCHASKA and VELICER, 1997), as they already understand the cost and benefit of some behaviour but still have no idea how to start.
   c) Preparation is the condition that people have a plan to take action in the immediate future, commonly next month (PROCHASKA and VELICER, 1997). In this stage, people have a plan of action, such as joining an investment class, making an appointment with a financial advisor, and reading a personal finance book. People in this stage will be easier to change their behaviour as they already have sufficient knowledge about finance and need affirmation when meeting other people with the same interest.
   d) Action is the condition in which people have new specific modifications in their lifestyle within the past six months (PROCHASKA and VELICER, 1997). People

in this stage already applied some of the actions they learned from books, advice from a financial advisor or personal finance class. People in this stage need financial material that could help them evaluate their new lifestyle and make some personal counselling to improve their new routine.

Between the four stages (pre-contemplation, contemplation, preparation, and maintenance), there were three conditions:

a. Maintenance is when people already change their behaviour and try to keep on track with the new behaviour. They are less tempted to relapse to the old lifestyle and increasingly more confident that they can continue their change (PROCHASKA and VELICER, 1997). People in this stage are already consistent at least six months with good financial behaviour. For example, they already check their financial condition each month, start accumulating their emergency funds, consistently put their money into an investment, etc. In this stage, people need a partner to discuss more advanced personal finance. They need collaboration to increase their personal finance goals. The business meeting is the proper intervention to maintain their behaviour.
b. Relapse is the condition when people reverse to the previous stage. For example, people already have good behaviour in stock investment, until one day they lose much money from the stock investment. The loss is traumatising and makes them want to stop investing in the stock market. In this condition, people need a financial advisor to break down the main problem of the loss on the stock investment that makes them traumatise. They perceived it as a traumatising event, because they use their emergency money or saving account for investment. They do not use idle money that even the money loss will not be a problem for them.
c. Termination is the condition when people could stay on good behaviour and do not have the temptation to back into their bad behaviour. They have 100% self-efficacy; whether they are bored, depressed, anxious or stressed, they could keep the good behaviour (PROCHASKA and VELICER, 1997).

2. Theory of Planned Behaviour (TPB)

   This theory is the modification of the theory of reasoned action (TRA) developed by FISHBEIN (1979). AJZEN (1991) developed TPB from TRA. This theory predicted people's behaviour from their intention. The intention in this theory is determined by attitude, subjective norm, and perceived behavioural control. Many researchers use this framework to predict financial behaviour. One of the findings of previous research in this framework is that the financial planning horizon has an essential role in predicting people's financial behaviour.

3. Self-Determination Theory (SDT)

   This theory developed by DECI and RYAN (1985) proposes that people have three types towards a particular activity: unmotivated, extrinsically motivated, and intrinsically motivated. People who are not motivated (unmotivated) usually lack extrinsic and intrinsic motivation. It is related to their belief that behaviour does not give them the desired outcome and, they do not understand the value of that behaviour.

   People who are extrinsically motivated could be determined by four different behavioural regulations (DECI and RYAN, 1985). The first is external regulation: people with external regulation will change their behaviour by external factors such as fear of loss and the desire to achieve rewards. For example, people who understand the potential loss of their credit card will not use their credit card. The second is introjected regulation. People having this motivation behave to gain social acceptance, self-worth and avoid feeling guilty. For example, people start their investment, because all their friends have already started investment, he/she is feeling guilty because of it. His/her behaviour is also socially accepted by colleagues. The third is to identify regulation; this factor is self-determined motivation in which a person wants to achieve a valuable outcome highly. For example, people are determined to live below their income and spare their savings account into an investment. This behaviour could help them gain financial independence in the next ten years. Fourth is integrated regulation. In this part, people are entirely motivated by themselves. For example, people that already understand the importance of frugal living and understand the wealthy mindset. They will plan their financial goal and keep their healthy financial behaviour with fun and are not pressured by society or themselves, they will make it a good financial habit, and they will live with that behaviour for the rest of their life.

Financial education in this research has a role in promoting and educating participants to stimuli their awareness of personal finance. Based on TTM, this research addresses people's necessity in the pre-contemplation, contemplation, and preparation stage of behavioural changing. People in the pre-contemplation need information about a potential loss if they make a bad financial decision. At the same time, people in contemplation need an affirmation about their current belief about personal finance. At last, people in the preparation stage of changing behaviour need a practical way to execute their knowledge into actual behaviour. Theory of planned behaviour contribute to this research that we should consider society attitude, norm, and belief in creating the financial education material. People’s attitude, norm and belief should be considered as it is their anchor value about finance and money. We used this approach to understand their anchor value and then we understand how to re-engineer their anchor value. The last is self-determination theory (SDT), which contributes to this research as basic knowledge on how to motivate people to change their behaviour. The framework from SDT contribute that we should provide not only external factors as an example for motivating people to change their behaviour. Some people could be motivating by social acceptance, self-worth and self-determination.

2.6. Learning style of generation Z

Currently, generation Z already comes to the university. Studies in sociologist have classified people into five generations: traditionalists, baby boomers, X generation, millennials and Z generation. Each generation has a specific and unique learning style (POLAKOVA and KLÍMOVA, 2019). People were born in between 1925-1945 were classified as traditionalists who prefer instructor-driven lesson because they respect authority (COOK and MACAULAY, 2017). Baby boomers who were born between 1946-1964 prefer learning environment that give them space to speech and they also like independent learning (LEVONIUS, 2015). The next is people who were born between 1965-1980 who were classified as X generation, they are independent learners, tech-savvy, open with new things and still respect authority (LISSITSA and KOL, 2016). Millennial generation (1981-1994) which is the most connected generation because they are among the first who got computers during their school. This generation loves e-learning, network learning, activity based group and collaboration with colleagues in the class (COOK and MACAULAY, 2017). The youngest generation observed today is labelled as generation Z (born after 1995). This generation, just like the millennials, have more exposure to the technology in any single aspect especially in education (SZYMKOWIAK et al., 2021).

Z generation who was born as a digital native, spend nine hours a day in average in their technology. High exposure of digital technology makes this generation have short attention span and expect instant gratification (CHUNTA et al., 2021). That behaviour leads this generation to prefer learning using individualized, visual learning that is integrated to video, using power point slides, discussion and interactive discussion (CHUNTA et al., 2021; HUANG et al., 2020). They also expect the tutor/facilitator to be an effective communicator, enthusiastic, passionate and knowledgeable in their teaching subjects (WILLIAMS, 2019).

Providing a high-quality teacher with these qualities is not an easy job. Then, identifying their preferred learning style is important, because it could be matched with materials that we develop. Previous research found that generation Z prefer visual presentation using tools such as power point, an online interactive video conference would be expected, storytelling that based on real experience also interest them, realistic and non-normative material more acceptable, using technology to communicate and discussion perceived easier for them (MORENO and CAÑAVERAS, 2020; WILLIAMS, 2019).

2.7. The recent suggestion in financial education

Current research in financial education still discuss how to increase the effectiveness of financial education. Based on previous research, several factors could increase the effectiveness of delivering material on financial education. Some researchers examine effective financial education. Table 2 shows a summary of what we should do to increase the effectiveness of financial education:

Table 2. Previous research recommendation on financial education

No	Authors	Suggestion and Recommendation for financial education
1	ROMERO and USART, 2013	Several factors that could increase the impact of financial education: 1) program content and characteristics, 2) motivating client, 3) group-based intervention, 4) using modern media, digital resources, and game-based learning
2	BATTY et al., 2015	A well-targeted education program could increase the impact of financial education on their financial knowledge and that knowledge sustains for up to a year later
3	CARPENA et al., 2015	Traditional financial education, which implements a one-size-fits-all approach, may be inadequate to motivate individuals with appropriate tools to change their knowledge into behavior
4	HATHAWAY and KHATIWADA, 2008	Financial education should be highly targeted towards specific audiences and areas of financial activity just before they face with specific financial events (such as buying a house or using a credit card)
5	FRENTZEL et al., 2010	Highly targeted, proactive, individually tailored forms of counselling could help increase the impact of financial education
6	TOTENHAGEN et al., 2015	Addressing different backgrounds and needs is important in financial education
7	FRENTZEL et al., 2010	People tend to change when they see the benefit of changing their behavior
8	TOTENHAGEN et al., 2015	Develop materials that align with the interest of the participant to maximize their motivation to learn and internalize the material
9	FRENTZEL et al., 2010	The barrier to change is low to motivate participant change their behaviour
10	TOTENHAGEN et al., 2015	Essential knowledge is important such as (1) budgeting and saving, (2) investing, (3) credit and financing, (4) taxes, (5) insurance, (6) banking and financial services, (7) goal setting, (8) fraud and identity theft, and (9) special topics for young children
11	HADAR et al., 2013	Financial education should deliver more than knowledge, and participants need soft skills

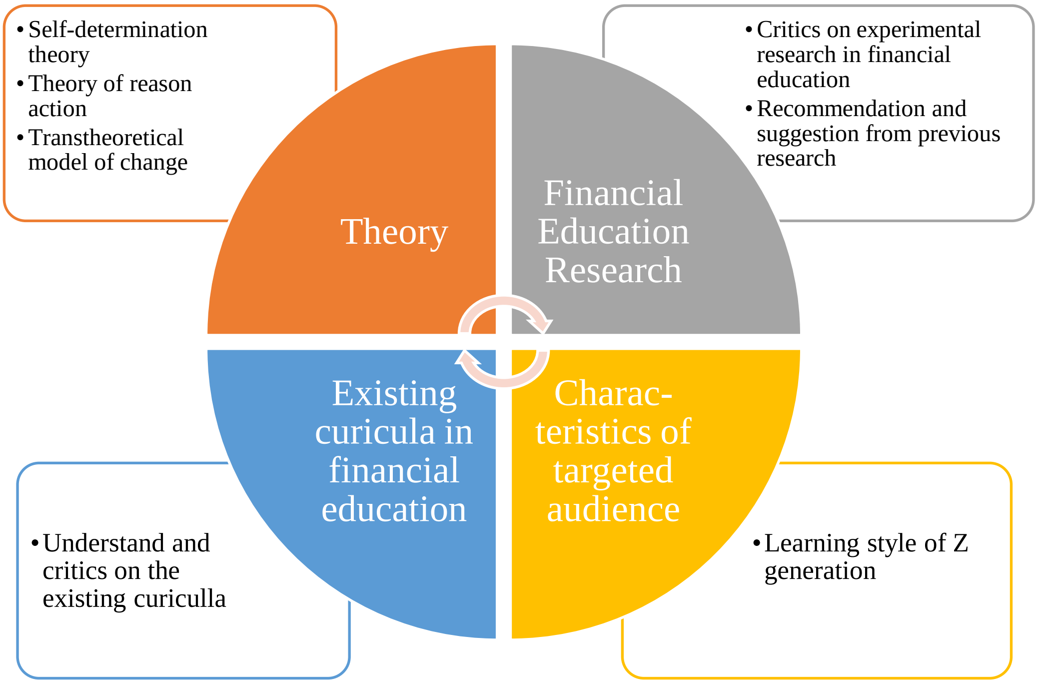
12	WEST, 2012	Financial education should not only deliver financial market and product but highlight psychological biases and limitations that people did not easily avoid
13	FERNANDES et al., 2014	Time delay effect: Previous research found that the longer the measurement is, the longer the effect will disappear if they do not have supportive environment
14	JOHNSON and SHERRADEN, 2007	Well-designed financial education program is essential, and each age needs different financial education

Source: Author's own work (2021)

Table 2 shows several research recommendations to increase effectiveness of financial education. This research tries to classify these recommendation and suggestion into several factors that will be labelled as the key factors to develop financial education material. As we can see in Table 2, researchers suggest similar recommendation that they believe could increase effective financial education.

As a summary, Figure 4 shows which four main sources were used to establish three critical factors in developing financial education material. The factors are the result of interpreting several theories in behavioural finance and motivation, review previous financial education research, understand characteristics of targeted audience, and recognize the existing financial education curricula. This research executed an extensive literature review from many sources such as previous research in financial education, theories related to financial decision and existing financial education curricula as shown in Figure 4. All of them were used to identify three most important factors to develop financial education material. In the next sub-chapter, we discuss how we formulate the critical factors that will be used to develop financial education material.

Figure 4. Sources that used to identify key factors in financial education material



Sources: Author's own classification (2022)

2.8. The critical factors to develop financial education material

Based on previous research suggestion and problems in financial education research, this research categorizes and classifies each of the problems and suggestions into three critical factors. These three critical factors are essential to be considered for everyone who plan to develop financial education. Here is the process on how three critical factors is formed.

Here we found that some suggestions such as each age needs different financial education (JOHNSON and SHERRADEN, 2007), the material needs to be aligned with the interest of the participants, different background needs different issues to discuss (TOTENHAGEN et al., 2015), highly targeted and tailored material is important (FRENTZEL et al., 2010), and content of the program is substantial (ROMERO et al., 2013). All those suggestions emphasise that customised material in financial education is essential for the audience. The audience does not need one-fit-for-all financial education material, such as calculating interest and diversifying risk in general. They need something close to the daily financial decisions and financial problems. Even previous research suggests that essential knowledge such as budgeting, investment, saving, retirement, insurance, banking service and goal setting is essential in financial education (TOTENHAGEN et al., 2015). However, the fact states that each stage of life has a different problem and different financial decisions. University students need financial knowledge about managing their costs, learning primary investment, and basic financial planning. While the middle aged (40-50 years old) need more sophisticated financial knowledge such as solving their over debt problem, start their active asset for retirement, and plan for retirement. The fitness of materials with audience expectations is the first critical point used in this research. So, based on this argument, the first keys to develop financial education is that the material should be **tailored for specific audience.**

Another recommendation from previous research suggests that financial education will have more impact if they induce motivation in the material (ROMERO et al., 2013). Motivating the audience in financial education is critical as financial education aims to change participants' financial behaviour. People need to be motivated to change from their regular habits into new behaviour. They need reasoning to change and see what the benefit is for them in case of changing their behaviour. There were several ways to give them a reason to change their behaviour. Describing the benefits of changing the behaviour is one of the tools to change their behaviour (FRENTZEL et al., 2010). Explaining to them the cost of wrong financial decision could also help people to create awareness to avoid the wrong financial decision. Telling participants, the urgency to change current behaviour is one of the keys to motivate people to change their behaviour. Developing materials that fit the audience could also quickly internalise with participants' interest (TOTENHAGEN et al., 2015). Congruency between the materials that we deliver, and participants' interest could motivate the audience to change their behaviour as they could easily relate their life with the material. Another reason why material fitness with the audience is important is that the audience needs a low barrier to change (FRENTZEL et al., 2010). The easier it is for the audience to mimic the example and cases in the class, the more they are motivated to change their behaviour. Giving participants motivation to change their behaviour and informing participants about the impact of the good and bad financial decisions is the way to create their awareness and motivate them to change the behaviour. Some people that having bad experience with financial decisions could easily understand the importance of a good financial decision. However, a university student is not yet exposed to a complex and big financial decision. Helping them to expose a story of bad and good financial decisions that they will face soon could help them internalise the urgency to make a good financial decision. This statement aligns with the external motivation that people need to understand potential loss and reward to change their current behaviour in self-determination theory. In this second classification, this research summarises the second key factor to develop financial education material is **people need motivation to change behaviours,** it should be included in the financial education material.

A student with good financial knowledge is motivated to change his/her behaviour. They need financial education materials that explain about financial decisions. They need that because they will make a new financial decision based on their new knowledge. To understand psychological aspects in financial decisions is crucial for them because many people make irrational financial decisions. People do not easily avoid psychological bias, that is why it is important to teach financial decision bias in financial education (WEST, 2012). That statement aligns with the previous finding that people need more than knowledge in financial education and soft skills (HADAR et al., 2013). Then the third key factors in developing financial education material is should be included **financial decision bias** material.

These three key factors (Tailor for specific audience, motivate student to change the behaviour and teach student financial decision bias) that explain above are the main treatment in this research. These three factors come as solution of ineffective financial education. The details discussion of each factors explains below.

2.9.1. Tailoring for specific audience

Many previous research suggested that "teachable moment" and "just in time" financial education is one of the key of successful financial education (BOWEN, 2002; COLLINS and O'ROURKE, 2010; DOI et al., 2014; KAISER and MENKHOFF, 2017, 2019; KEMPSON, 2018; MILLER et al., 2015; PENG et al., 2007; XIAO and O'NEILL, 2016). National Endowment for Financial Education (2004; 2006) held multiple financial education forums and concluded that "teachable moments" is critical to delivering financial education. This research defines "teachable moment" and "just in time" financial education as the fitness of education materials that delivered in the course based on the participants' needs.

The term "just in time" and "teachable moment" in this research refer to the right time to teach. Previous research found a delay time effect when teaching financial education (FERNANDES et al., 2014). The impact of financial education is reduced linearly with time. The longer the time delay between participating in financial education and making the financial decision, the lower the impact will be. Then the previous researcher suggests "just in time" financial education to solve that problem. Just in time financial education is when the material delivered in financial education has a small gap with participant financial decisions. That is why this research aims to develop customised financial education material to give them an example that is close to student life, as it will reduce the time gap between understanding finance and making financial decisions. This research collected data from several points of view. The data collection is part of the first stage in this research. We collected data from student expectations in financial education, adult financial problems, and an independent financial advisor's suggestion was used to reconfirm the finding.

There are several benefits if we develop materials that fits student expectations and is close to students' daily financial decisions. First, we could quickly get their attention to the education material. The students will easily relate their life to our material. It will catch their attention, and it is a good starting point. The students will listen and open their mind to our material. They will actively ask for a solution as they already face that problem. The most valuable part is that it will be easier to induce a good value in the financial decision, because we have already got their attention. Secondly, one of the previous researchers suggests that we should give an example that needs a low barrier to change in financial education (FRENTZEL et al., 2010). Then the audience will not have any problems if they want to apply their financial knowledge to actual behaviour. For example, property investment is an example that has a high barrier for university students. They are still far from that decision, and they need a lot of effort and resources to apply that knowledge. So, putting property investment as a material in financial education for a university student will not meet their expectations. Whereas inducing university students with micro-investment such as stock market, buying gold as a hedging instrument and teaching them to live frugally would be more suitable with them. They could quickly shift their new knowledge into an action to buy stock in the next week or start to buy gold as hedging for their emergency funds and applied frugal living to start saving more money. By delivering materials that suits students' daily lives, we could reduce the barrier to applying financial knowledge to financial behaviour. They will quickly act as it is a low barrier to change for university students. Low barrier to change in financial behaviour is important as it could prevent the possibility of people fall into procrastinators. Procrastinators exist because people who need a long stage from understanding the new knowledge and change it into their actual behaviour. One of the determinants of procrastinators is a lack of resources to execute the knowledge into actual behaviour. Then it is essential to give students knowledge that suitable with their resources to avoid the possibilities of procrastinator that could arise in the financial decision. The procrastinator bias will be explaining more detail in the financial decision bias part of this literature review.

2.9.2. Motivation to change behaviour

Financial education aims to change participants' bad financial behaviour. Inducing motivation has an important role in behavioural changing. This material delivers motivation by giving them reasoning to change their behaviour. We explain the reasoning to change their behaviour by explaining the harmful effect of bad financial decisions and the advantage of good financial decisions. It will help students understand why they should change and how urgent it is for them to change their financial behaviour. Delivering information and knowledge about personal finance is not enough (OECD, 2019). It needs more than transferring knowledge to change people's behaviour. One of the essential factors included in the material to raise participant awareness to change their current behaviour is motivation. Inducing motivation with the material is essential as it will help people turn good financial knowledge into good financial behaviour. The common misconception of people who participate in financial education is that it will automatically turn their knowledge into good financial behaviour (WEST, 2012).

Previous research found that the process of shifting from financial knowledge into financial behaviour takes motivation and self-confidence (LUSARDI and MITCHELL, 2007; MANDELL and KLEIN, 2007). Motivation to change behaviour has been studied for a long time in the field of behavioural economics. Researchers explored why people change their ineffective behaviours into more effective (BELSKY and GILOVICH, 2001; SHOCKEY and SEILING, 2004). Based on the transtheoretical model of change (TTM), people change their behaviour from pre-contemplation into contemplation in several ways. Negative emotions such as fear, anger, guilt, embarrassment and jealousy are common emotions that could motivate people to change their behaviour (ROWLEY et al., 2012). Life transitions such as childbirth, divorce, layoff from employment and moving to a new location also influence people to change their financial behaviour (ROWLEY et al., 2012).

Previous research shows that negative emotions and life transitions could motivate people to change their behaviour. The shock effect could wake people up from their daily life and increase their awareness of their current condition. This research will create a similar feeling using the story of people who fall into a wrong financial decision. We collected the story of the adult financial problem from the first data collection, and we contact some of them to get the details of the story. We collected their story and decided to tell one story at each meeting to enhance student awareness. The story is about a financial disaster; it aims to wake them up that those bad things could be happening to them financially if they do not have sufficient financial knowledge. Participants do not only learn from bad financial decisions, but we also explain the advantages of good financial decisions. Delivering both (bad and good) financial cases is essential, because people love to hear good information (good financial cases). However, people aged 18-30 years old are one of the best ages to learn best from bad information (bad financial decision) (MOUTSIANA et al., 2013).

2.9.3. Bias in financial decision

People with good financial knowledge and motivation to change their behaviour are not enough to make a good financial decision. Several psychological biases (risk tolerance, attitudes towards money, overconfidence, etc.) can affect the relationship between financial knowledge and financial behaviour (GOYAL and KUMAR, 2021). While, literature in behavioural change explains that people need to pass four stages to change their behaviour, starting from the pre-contemplation stage into action (NORCROSS and PROCHASKA, 2002). Then measure the impact of financial education could be better if it could assess participants' financial behaviour, as it is the end of the financial decision process.

Three cognition biases commonly occur in financial decisions are mental accounting, procrastination, and loss aversion. **Mental accounting** is a process of labelling some of the money based on sources. **Procrastination** means people tend to delay their financial decision. This bias could retard people to achieve their financial goals through financial planning (WANG, 2017). Fighting procrastination is essential to reach financial wellness (WANG, 2017), as it exists in every financial condition stage.

The subsequent decision bias that commonly arises in the daily financial decision is loss aversion. **Loss aversion** is an essential concept in decision bias associated with prospect theory. Loss aversion explains that pain in losing is psychologically twice as powerful as the pleasure of gaining (KAHNEMAN and TVERSKY, 1979).

To avoid common financial decision bias, this material also teaches the students the determinant of impulse buying as the source of overspending behaviour. We also teach a student the six most common misconceptions in financial decisions. Financial education should teach more than delivering financial information, and participants need soft skills (HADAR et al., 2013). Financial decision bias is one of the materials that could be taught to participants beyond financial information. By understanding the concept, the participants could avoid an irrational financial decision that commonly happens in society. At the same time, the most popular financial literacy measurement uses the big three (compounding interest, inflation, and risk diversification). Currently, they develop big five questions with additional questions by asking participants about interest in mortgage and interest in bond pricing. To fit with the most popular financial literacy measurement, many researchers in financial education set the material in financial education that covers only compounding interest, inflation, risk diversification, interest in mortgage and interest in bonds. All of them were still focusing on mathematical skills and financial information. However, people need more than mathematical skills to make a better financial decision. **The aim of teaching them financial decision bias is to make them understand that they should avoid that biased decision.**

2.9. Summary of the key factors in developing financial education material

As the result of the second stage of this research, three critical factors were found for financial education. As a summary, the customized financial education will be a focus on the material that is:

1) **Tailored for specific audience,** in this research for university students in Indonesia,
2) The material delivers **motivation to change participants' financial behaviour**,
3) Teach participants the **bias in financial decision**.

These three factors are the syntheses from the result of previous research and financial behaviour theory. Table 2 summarises how the key factor develops and the definition of each key factor. In the process of development, the key factor is the syntheses of previous research and theory that has been already explained the details at the beginning of chapter 2. The definition of the key factor is important to be written, as it will help to develop the material and measure the manipulation check at the end of the experiment session. Here is the summary that figure of how these three factors arise and the definitions from each of them.

Table 3 shows the definition of each key factors that we used to develop material in financial education. This research developing the financial education materials by analysing questionnaire on the adults' financial problems, understand university students' expectations, interview with independent financial advisors, understanding some topics by doing literature review in several topics such as marketing, consumer behaviour, bias financial decision, household finance, investment decision, etc. The detail of customized material is explained in Chapter 4 (in the results of third stage).

Table 3. Summary of the key factors to develop financial education material

Problem / Previous research suggestion	Solution	The key factors
- One-fit-for-all financial education did not help to change people's behaviour, - Time GAP between knowledge and practice, - Lack of resources to execute the knowledge, - The different background needs different knowledge that in line with participant interest.	Each group of participants need different financial education topics to discuss. It can help them to understand the material easily.	The material should be **tailored for certain participants:** - Choose a topic that fits with the students' needs - Give an example that is close to their daily life - It should meet with the audience's learning style
- External Motivation (SDT) - People need more than information, they need motivation - Information is already available, but people have no intention to learn	To increase the probability of people of changing their behaviour, they need motivation, examples that are easy to replicate and the urgency to change their behaviour.	The material should include **motivation to change behaviour**: - Give a bad and a good real case study on financial decisions - Induce a sense of urgency to change behaviour - Give an example that needs a low barrier to entry
- People limited their financial decision with bounded rationality - People need to learn psychology in financial decision - A common misconception in the financial belief	To avoid financial decision bias, people need to understand psychological factors that could easily lead them to bias in financial decision.	The material should include **financial decision bias:** - Teach students common biases in the financial decision (mental accounting, procrastinator, and loss aversion) - Teach students misconceptions in society about money - Teach students marketing tricks that could influence people into an impulse buyer

Source: Author's own compilation (2020)

2.10. Outcome measurement of financial education

Previous research on financial education examines the outcome of financial education with several variables. The most common outcome of financial education is financial literacy, financial knowledge, financial attitude, and financial behaviour. The term financial literacy has been used since 1992 by National Foundation for Educational Research (NFER). Then Jump$tart Coalition for Personal Financial Literacy developed a theoretical construct about financial literacy in 1997. One of the first institutions that promote the financial literacy term worldwide was OECD. OECD defined financial literacy as a set of awareness, knowledge, skills, attitude and behaviour to make a sound financial decision and achieve individual well-being (ATKINSON et al., 2012). In comparison, there are also several definitions from the previous researchers.

One of them defines financial literacy as people’s ability to process financial information and make informed decisions to improve their financial status (LUSARDI and MITCHELL, 2014). Others define financial literacy as a person's cognitive ability, existing financial knowledge, and skill to apply the knowledge to desirable financial outcomes (HUHMANN, 2014). The definition of financial literacy is highly diverse as many authors use their definition (ATKINSON et al., 2012; NEMETH et al., 2016). The terms financial literacy and financial knowledge are used interchangeably. However, some researchers define financial knowledge as understanding financial concepts and procedures and understanding how to solve financial problems (SWIECKA et al., 2019).

In conclusion, there are three aspects as the essential in the definitions of financial literacy and financial knowledge. It is related to people’s understanding of financial information, ability to process that information, understanding how to solve their financial problems. The definition of financial literacy and financial knowledge ended at personal knowledge or cognitive ability about finance.

The subsequent measurement of financial education outcome is financial attitude. There are several options to measure attitude. Some researchers measure attitude in the framework of the theory of planned behaviour (AJZEN, 1991). The theory of planned behaviour states that people's behaviour impacts the attitude towards the behaviour, subjective norm, and perceived behavioural control. Others argue that attitude towards money is part of a construct referred to as “financial literacy” (AMAGIR et al., 2018). The money attitude scale (MAS) was developed to measure financial attitude. It consists of five dimensions: power-prestige, retention-time, distrust, quality, and anxiety (YAMAUCHI and TEMPLER, 1982). The power-prestige dimension explains where money is the symbol of success and power. Retention-time explains how individuals focus on preparing for the future and keeping their financial condition under control. The distrust is when people perceived money with suspicion, almost fear. The quality perceived that money as a tool to buy quality products/services. The anxiety perceived money as a source of anxiety as well as a source of protection. Another study commonly used by many researchers in household finance is the Money Belief and Behaviour Scale (MBBS) that consists of six dimensions (FURNHAM, 1984). The six dimensions are like MAS developed by Yamauchi and Templer as they develop the instrument using several previous works. The six dimensions of MBBS are Obsession, Power, Retention, Security, Inadequacy, Effort and Ability.

Prior researchers have used financial behaviour as an outcome of financial education. Financial behaviour change is an outcome of financial education (ATKINSON and MESSY, 2013). It is classified as the ultimate outcome as the final aim of financial education is to change from bad into good financial behaviour. Many researchers measure a different kind of financial behaviour. In the United States, the debt behaviour of young adults has been measured to assess the impact of a financial education program on their debt behaviour (BROSWN et al., 2016). The impact of financial education is also measured in participant saving behaviour in the context of retirement planning (BERNHEIM and GARRETT, 2003; CHOI, LAIBSON and MADRIAN, 2004; CLARK and D’AMBROSIO, 2008; LUSARDI, 2004). Investment behaviour and delay gratification in spending behaviour were found to be related to financial literacy training (CARLIN and ROBINSON, 2012).

3. MATERIAL AND METHODS

The first stage of data collection aimed to identify prior financial topics that are important for university students. This research collects data using the triangulation method from an adult perspective, student expectations, and independent financial advisors to answer this question. This research targeted adults as they already face several financial decisions and financial problems. Adult financial problems have been used as the basic data of developing innovative financial education in the second stage of this research. The students' expectations were collected to understand their expectations on financial education. Then in an in-depth interview we made to confirm the data from the adults' financial problems with an independent financial advisor.

The second stage of this research aims to find out factors that could increase the impact of financial education on university students. The literature review has been used to identify critical factors that could increase the effectiveness of financial education. This research found several factors that could improve customized financial education material.

The third stage of this research is a process of developing financial education material. In this stage we develop education material from many resources such as: research report, news, biography, popular book, etc. We collect, classify, and filter all the resources to make it the most suitable material for university students.

The fourth stage of this research aims to test the impact of customizing financial education developed in this research. This research uses randomized experiments to test the customized financial education. The sample on the fourth stage is university students in Indonesia aged 17-25 years old. The treatment and control groups were used to find out the different results of use different materials. Table 4 shows the summary of data collection on the four stages of this research.

Table 4. Stages of research

Stage of research	Aim	Method
First stage	Identify the most critical topics in financial education to learn for university student	Questionnaire and in-depth interview
Second stage	Identify critical factors to develop financial education	Literature review
Third stage	Develop customized financial education materials	Literature review and secondary data
Fourth stage	Examine the customize financial education	Experimental

Source: Author's own compilation (2020)

3.1. First stage

A pilot test was conducted before collecting the data. The pilot test aims to make sure all the questions did not cause multi-perceptions for the potential participants. A total of 73 people participated in this pilot test. The pilot test was conducted on-site to collect all participants' feedback about the questionnaire. There were 23 adults and 50 university students who participated and gave feedback about the questionnaire. They gave feedback for some questions that confused them and raised the multi-perception of the definition of some words. Then we revised some words to make them more understandable for all participants. The participants of the pilot test were volunteers, and they were students at bachelor and postgraduate students at Jenderal Soedirman University.

The first stage of this research aims to identify potential financial education topics for university students. The primary sample for the first stage was undergraduate students with an age range of 17-25 years old. Other respondents were adults aged 30-50 years to explore financial problems that commonly occur at their age. This research also collected data from independent financial advisors that provided input on adult financial problems that commonly exist for their clients.

In the first stage of this research, data collection was carried out using triangulation. Questionnaires and in-depth interviews were used to identify relevant topics to develop in financial education. The questionnaire was conducted to obtain financial topics from three different points of view. The first perspective was to get data from adults' (30-50 years old) financial problems. The second viewpoint was getting data from students at the undergraduate level (18-25 years old) to identify their expectations regarding the financial education topic. The third party was an independent financial advisor to confirm the adult financial problems that commonly exist. These three points of view provided a more comprehensive source of quantitative and qualitative data from the first research stage.

In this first stage, data was collected using the convenience sampling method. The survey spread through online and paper questionnaires. The online questionnaire spread through the link on messenger applications and social media applications (WhatsApp chatting application and Facebook). The paper questionnaire was collected through friends and colleagues in Indonesia. In the first stage, data collection took 60 days, from January to February 2020. The survey for adults consisted of 27 questions; there are demographics (4), financial background (2), financial problem (1), and financial literacy (20). Each participant needs 3 – 5 minutes to finish all the questions. While for students, this research collected data through a survey with 26 questions, there are demographics (4), financial literacy (20), and financial education (2). Financial literacy measurement in the first stage uses a long-form financial knowledge score developed by KNOLL and HOUTS (2012).

A total of 1.057 people participated in this first stage of this research, but only 844 were valid for the analysis as they filled all the questionnaires. There are 455 adult participants and 389 students valid for the first data collection. A total of 844 respondents had heterogeneous demographics who filled in the open questionnaire. The details of number participants in the first data collection can be seen in Appendix 1. To confirm the findings from 844 participants, in-depth interviews were done with ten independent financial advisors to classify and categorize the adults' main financial problems.

The requirement to fill in the survey was that the participant must be between 30-50 years old for the adult research sample and 17-25 years old for university students. While the requirement for the independent financial advisors was that they are already certified financial planners and have already had experience of more than five years as an independent financial consultant.

To understand what the main adult financial problem is, open-ended questions were used. The adult participants were asked about their experience in financial problems and difficulties. The answer is various, and they mostly tell the story of their own or their relatives' financial problems that affected them. To analyse the answers, keywords were used, and problems were classified into several big topics in personal finance. Each case is interesting, and it could fall into one financial topic, while the other cases could fall into more than one financial topic. Content analyses were used in this stage to understand their financial problem. For example, one participant told us the story of the parents' bad financial behaviour that directly hit their financial condition. In the short story, these cases consist of a spending problem, debt problem, and mind-set problem of their parents that should be resolved together. These cases give us a lesson that we should put information and motivation to change the wrong financial mind-set.

To collect student expectations about financial education data were collected from university students' perceptions. Students' expectations are essential to be understood as they will become the primary sample of this research. Two essential points of view for us are students' expectations of the learning outcome of the financial education and their preferred topic that should be discussed in the training. To collect both, open-ended questions were applied in the questionnaire. For the analysis of this part, content analysis were used.

During this research the findings were cross-checked with independent financial advisors to confirm the findings from adults' and students' perceptions regarding the financial problem. As financial advisors, they face many financial problems that come from their clients. The aims of independent financial advisor become part of this research is to make sure that our early findings are confirmed with their experience as they resolve many financial problems. There is some requirement to confirm that the interviewees are qualified to answer the questions. They should work as a professional independent financial advisor; they should be officially certified as a financial planner (CFP), they should already have the experience to advise clients at the age of 30-50 years old. Semi-structured questions have been used to collect data from the CFPs. The main question for them is: what is the problem that adults commonly face when seeking advice from you as a financial advisor? Then we gave another question based on their initial answer to ensure they gave us at least five main problems that they commonly face from their clients. Then we classified their explanation and summarized their answer in the result part of this dissertation.

The output from the first stage of data collection was finding several important financial topics for university students. As this first stage collects data from three points of view, this finding gives a more comprehensive view of the most critical topics for university students to learn about personal finance. In this first stage, this research found the five most important topics that should be learned for university students about personal finance. The adults' financial problems, the university students' expectations, and independent financial advisors' experience are the main contributors to what should be taught in financial education for university students.

3.2. Second and third stage

In the second stage of the research, literature review was done to identify the critical factors to develop financial education materials. Several sources were used in this stage such as previous research in financial education, theories that commonly used in financial behaviour theory, research in learning style of generation Z and existing financial education curricula. All of them contribute to develop which the most important factors are to develop financial education materials. To sum up, this research found several factors that could be used in developing materials for financial education. These three important factors: 1) tailored for specific participants, 2) inducing motivation to change the behaviour and 3) teaching them a bias in financial decisions. Those three factors are the primary treatment of this research that here is called as customized financial education. Here customized means that the material fits the students, and we are not only delivering information, but also motivating them to change their behaviour.

The third stage, development of the customized financial education material has been done before testing it in the experimental class. The development of customized material starts from collecting data of adult financial problems that could be used as stories for bad financial decisions. Stories of successful people who make a good financial decision come from many sources: biography, news, etc. Research report that discusses about fake investment. Financial behaviour theory to understand how people make financial decision. Bias in financial decision

3.2. Fourth stage of the research

In this stage, the experimental method was used to test and validate the impact of customized financial education. The students in higher education were evaluated for a certain period. The total of 965 students registered initially, but only 862 students completed all the requirements of this research in this second data collection. The details of the participants in the second data collection can be seen in Appendix 2. Then the result was evaluated at the end of the research period. The experimental method was used for data collection to examine the causal effect of financial education. Before the experiment, all participants have been tested to measure their financial knowledge and behaviour. This score was used as an anchor score labelled as a pre-treatment score. Later after the experiment, they were re-evaluated. Financial knowledge and financial behaviour have been used to evaluate for all participants in this research.

3.2.1. The education material as the primary treatment

This research developed financial education materials based on the first data collection on financial problems, previous research suggestions, and behavioural changing theory. Data from financial problems are critical parts of the material as they could give the students a big picture of the financial problem that they will face in the next 2-3 years ahead. It also helps us to select the most crucial topics for university students to learn about in personal finance. Suggestion from previous research and behavioural changing theory helped the researcher to understand the important critical factors in developing financial education materials. This research found that the most crucial topics for university students were financial planning, management expense, and saving, investment, and debt. Based on previous research and behavioural changing theory, we found three critical factors in developing financial education: tailoring for specific participants, motivating them to change behaviour and teaching them a bias in financial decisions.

Customized financial education is critical to increase the effectiveness of financial education. Several factors that could improve the effectiveness are timely, contextual related, and practice-oriented. The students received customized education materials based on their age, culture, language, and experience. The topics are closely related to students' lives and their close future lives (2-5 years ahead). They will also get cases on real financial problems. These real cases will establish their awareness that people will get into trouble without financial knowledge. Psychology researchers found that from young to middle aged people have an excellent ability to learn from the bad news (MOUTSIANA et al., 2013). This material is the primary treatment of this research as the customized financial education. Financial education material is the main novelty of the research. This research develops material that fits university students, delivers motivation to change behaviour, and teaches them bias in financial decision. Previous researchers used conventional financial education materials that focused on mathematical knowledge such as interest calculation, risk preferences, and money's time value, which are not closely relevant to a daily financial decision.

3.2.2. Experimental design

The process of testing customized financial education has been done by comparing two classes. 2 x 1 between subject experimental design has been used in this research. Students were randomized into control group and treatment group. Each group (control and treatment) has pre-test and post-test to evaluate the impact of the treatment. Figure 5 explains the experimental design of this research. The treatment class received customized financial education, and control classes received conventional financial education. Students in treatment group classes receive financial education materials with the three key factors. While in the control class, students received conventional financial education. Students in the control group received traditional financial education material that discusses the inflation, interest calculation, time value of money and risk diversification. Analysis has been done by comparing the result between control class and the treatment class, comparing the result between pre-test and post-test was also executed to evaluate the result.

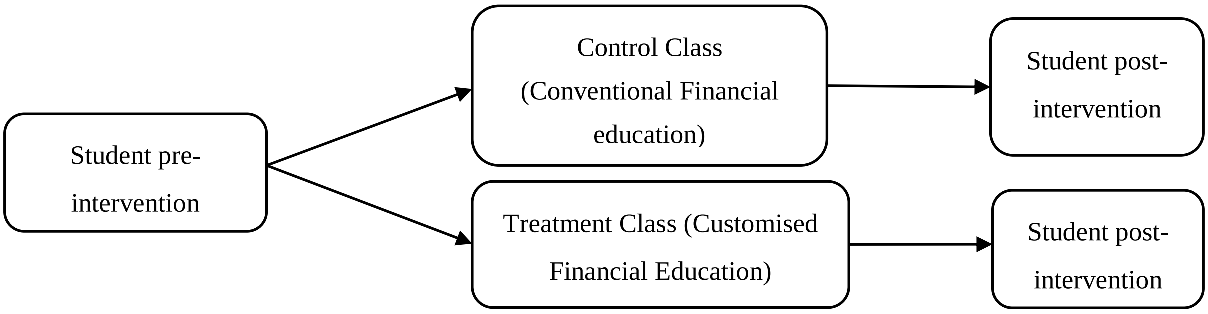


Figure 5. Experimental design

Source: Author's own design (2020)

The control group received conventional financial education, while the treatment group received customised financial education. Conventional financial education was adopted from previous research that used basic financial concepts as the treatment of financial education. The material consists of interest compounding, inflation, diversification, present value, future value, risk concept, interest rate, and bank service delivered in the control group. The treatment group received customised financial education that focused on the daily financial decision in four aspects: financial planning, expense management, saving, investment, and debt. Participants in the treatment group also received materials that fit the students, real financial problems and their solution, motivation to change into good financial behaviour and get an example that is easy to imitate for the students.

The data collection process for stage four of this research took eight months (September 2020 – April 2021). To collect the participants, a poster was made to announce for the personal finance class. The poster was spread at five universities in Indonesia and 925 students registered for the personal finance class. They were committed to join the class for four weeks and 862 students finished the class. Participants were randomly grouped into two classes as control and treatment classes. All participants filled in the registration, they signed an inform consent and got an identification number for the class. Each of them joined a total of 8 hours of online financial education training. Each course took 2 hours for four weeks to complete the material.

One of the requirements of the experimental design is a manipulation check. Manipulation check was used to make sure the treatment successfully induces to the participants. There are eight points of manipulation check as the definition from three primary treatments in this research. Table 5 contains the list of the manipulation check that was part of the measurement instrument of the research.

Table 5. Manipulation Check Experiment

THE CUSTOMIZED MATERIAL	DEFINITION	MANIPULATION CHECK
Tailored for specific participants	The topic is closely related to their life now and their near future?	Is the topic closely related to your life?
	The example is close to their daily life	Is the example close to your daily life?
Delivering motivation to change their behaviour	Deliver a sense of urgency to the student with a real adult financial problem that they will face in the next 2 – 5 years.	Does the material explain real financial problems that you will face soon?
	Explain advantages and disadvantages of specific financial decisions / financial behaviour	Does the material explain the advantages and disadvantages of specific financial behaviour?
	Give an example that needs a low barrier to entry	Is the example easy to imitate for you?
Inform students about bias in financial decision	Explain students the common financial decision bias in daily life	Does the material include financial decision bias in daily life?
	Explain the marketing trick to increase the impulse buying of customer	Does the material include understanding marketing tricks to attract impulse buyers?
	Explain the most common misconceptions in the financial belief	Does the material explain common misconceptions in financial belief?

Source: Author's design (2020)

3.2.2. The outcome of financial education

Different kinds of measurements were used in this research. Financial behaviour as an outcome of financial education has been used in the first and second topics (financial planning and expense management and saving). The third and fourth topics (investment and debt) were examined using objective financial knowledge. The outcome measurement should be different, because university students in Indonesia rarely make decisions in investment and debt in their young ages (17-25 years old), so it is almost impossible to make a financial decision related to debt and investment in their age.

The financial planning measurement was evaluated using scores between 0–100. Financial planning has a two-stage measurement: first stage is when students create a financial review, which consists of a personal balance sheet and annual income statement. The second is when the students make their financial planning, which consists of the forecast of annual income in the next two years and a quarterly action plan on obtaining the income. To understand the impact of financial planning course, students' scores were compared on pre-post questions using a t-test paired sample and comparing between control and treatment group using a t-test independent sample. The post-test of this measurement was conducted four months after the class finished. This delayed measurement was to make sure the effect does not only exist in just a moment after the education finished. This research gives an additional analysis of the financial planning session. Participants' perception about financial planning and financial review has been measured as subjective measurement.

The saving and expense management topics were evaluated using a self-filling questionnaire. The students answered several questions related to saving behaviour and expense management after finishing the class. The main goals of this topic are to deliver the motivation of frugal living, motivate students to start emergency funds, inspire students to save more money, and encourage them to spend wisely. The objective and subjective questions have been used to measure the outcome. The objective measurement in this part was to examine the increasing amount of checking balance of the participants. Indonesian rupiah as a currency has been used in this objective measurement. Each student was asked how much checking balance account she/he has right now. That objective measurement has been asked to the students before the class started and four months after the class finished. The subjective measurement examine students' perceptions on the importance of some topics in saving and expense management, this research also measured students' intention in the saving and expense management. The subjective measurement has been assessed before the class and right after the class ended.

The third and fourth topics in customized financial education were examined using an objective questionnaire. The questionnaire evaluated students' investment and debt management knowledge. This part only measures the investment and debt knowledge, because Indonesian undergraduate students rarely make debt and investment decisions (17-25 years old). The instrument was measured before and after financial education and compare the result with the different tests in statistics. The details of questionnaire that used in this research can be seen in Appendix 3.

The next discussion explains the summary of financial education materials that this research develops. This research called it as customized financial education material and it was used in the treatment group of the experiment.

3.3. Summary of financial education material

In each course, the participants received knowledge on theoretical, practical financial decision making and real cases on financial problems. Then, this research reclassifies the topics to make it more efficient to deliver. Reclassification is critical to make sure there is no overlapping topic. This research merges expense management and saving into one topic, they are closely related to each other.

Furthermore, this research identifies learning objectives from each of the topics. For example, the financial planning topic classifies learning outcomes such as financial goals and financial maturity. Table 6 shows the learning objectives that will become the material of innovative financial education.

Table 6. Topics and learning objectives

No	Topic	Learning Objectives
1	Financial Planning	Students understand: • the importance of financial planning (real case problem) and financial review for personal or family, • financial maturity level, • definition of financial planning and financial review, how to create a personal financial review and financial planning, • how to identify tangible and intangible resources, • how to monetise our resources into marketable products/services, • students can set their financial review and financial planning.
2	Expense Management and Saving	Students understand: • the importance of expense management and saving (real case problem), • the wealthy mindset and poor mindset, • the importance of cost tracing, budget monthly, know where to spend, consumptive and productive spending, • six practical ways to live frugally, • the role of emergency funds, the importance of emergency funds, how to start collecting emergency funds, and the rule of thumb of emergency funds, • the students could plan to manage the expense and start saving.
3	Investment	Students understand: • what is an investment and what is the advantage and disadvantage of it? • risk preference for investment, • the three basic principles of investment, • financial investment and rill investment, • investment fraud, • prepare retirement with investment, • how to find information for investment, • fake investment (real case problem).
4	Debt Management	Students understand: • what is debt and what impacts it has on their life (real case problem), • the importance to manage their debt for their life, • some type of personal debt they will face (housing and vehicle loans), • conventional debt and shariah/islamic debt, • the alternative solution to avoid debt, • the role of frugal living, • the importance of being debt-free.

Source: Author's design from primary data (2021)

The material of customized financial education is the primary treatment source for the second data collection of this research. The treatment of this research mainly relies on customized financial education. The customized financial education in this research is defined as the financial education that:

1. is tailored for specific participants,
2. delivers motivation to change their behaviour, and
3. teaches them bias in financial decision.

3.4. Statistical Analysis

Statistical analysis has been used to answer the third question of this research. The third question is: does the customized financial education material could be effectively delivered to university students? To examine this questions, this research compares the results between pre-test and post-test on each treatment classes, and compares the results of post-test on treatment and control group. Statistical analysis of different tests has been used in this research. Paired t-test and independent t-test have been used to understand the difference between the two groups. Customized financial education is delivered effectively if the result of post-test is higher than pre-test on treatment group and also the post-test of treatment group has higher score than the post-test of the control group. On the treatment group, there were four classes with different topics each. There were financial planning, expense management and saving, investment and debt management. In the control group, there were four classes with different topics, there were risk, interest and inflation, future and present value and bank service.

4. RESEARCH FINDINGS AND THEIR EVALUATION

4.1. Results and discussion of the first data collection

The first data collection aims to identify the most crucial topics for university students. The first data were collected from adult (30-50 years old) financial problems and financial experience. Heterogeneity of the participants in this research is essential, then we collect some data on demographic and economic backgrounds of the participants. We classify their economic background in financial condition and demographic participants based on their characteristics. Table 7 describes the demographics and financial background of the adult participants (30 – 50 years old). Total of 534 adults participated in this research, but only 455 adults passed all the requirements. This research excluded participants who did not fill all the questions and were not consistent with their answers.

Table 7. Demographics and financial background of adult participants

Demographics				Financial background			
1	Sex	Male	162	4	Gross annual Revenue	< 3.000 US$	101
		Female	293			3.100 – 5000 US$	70
2	Age	30-40 years old	216			5.100 – 7000 US$	157
		41-50 years old	239			7.100 – 9000 US$	80
3	Education	Not attend university	147			9.100 – 10.000 US$	47
		Bachelor	175	5	Financial maturity	Consumptive Debt	78
		Master	88			Have no saving account	78
		Doctoral	45			Makes end meet	62
4	Number of people living in the household	2	37			Have a small saving account	102
		3	72			Have a small passive income	83
		4	117			Have active assets that regularly generate passive income	52
		5	144	6	Financial literacy Level	Below Average < 50%	293
		> 5	85			Average 51% – 75%	83
						Above Average > 75%	79

Source: Author's calculation (2020)

Table 7 summarises the heterogeneity of the adult participants. First, this research divides people without a university degree (34%) and people with a university degree (66%). Most participants live with five people in the household. They live with the main family, some of them live with parent-in-laws and household assistants. The range of annual revenue also varies starting from 3.000 US$ until 10.000 US$. Most participants have 5.100-7.000 US$ gross annual income. From six levels of financial maturity, people vary from the lowest level which people using debt for daily consumption to the highest level which is people having an active asset that could generate regular passive income. The financial literacy level was measured by using objective financial knowledge. They answered 20 questions that measured their knowledge of personal finance. Most participants reached a below-average score. The variation of the demographics and financial background of participants in this research could surrogate the heterogeneous participants.

The second type of participants in the first stage was the university student. 523 students filled in the questionnaire from several public and private universities in Indonesia. The valid data from university students is 389, as they filled in all the questionnaires. To make sure about heterogeneity of the university students, demographics questions were used. Table 8 shows the summary of the demography of university students.

Table 8. Demographics and financial background of student participants

Demographics							
1	Sex	Male	102	4	Year of Study	First	14
		Female	287			Second	59
2	Field of study	Economics and business	209			Third	136
		Non-economics and business	180			Fourth	180
3	Hometown	Village	68	5	Financial literacy Level	Below Average < 50%	274
		Town	167			Average 51% – 75%	69
		City	154			Above Average > 75%	46

Source: Author's calculation (2020)

Table 8 shows the variability of student demographics in the first stage of the research. Female students dominate (74%) more than males (26%). 54% of the students are from the economics faculty and 46% are from other faculties. Students mainly come from a town (43%), followed by a city (40%) and the least from a village (17%). Undergraduate students are the most dominating participants in this stage (47%), followed by third-year students (35%), and the freshmen (4%). Most students have below the average financial literacy score, as it reaches 70% and only 12% bear with good knowledge financially.

To analyse the answers of the participants, conceptual content analyses were applied. All the answers were read and several keywords were collected to classify the cases from participants' answers. Participants answered the questions with their story and experience in personal finance. Mostly adult respondents answered the question in one paragraph of their financial stories. There were no minimum sentences to answer these questions, but the participants answered at least three sentences up to 15 sentences.

After reading all the answers, keywords were listed that commonly arose in the sentences to classify the answers into several categories of financial problems. Here Table 9 is the summary of the keywords used to classify the cases.

Table 9. Keywords to classify the cases

No	Financial problem	Keywords
1	Financial Planning	No financial plan, no financial target, going with the flow for finance, future budget plan,
2	Investment	Too much idle cash, investment fraud, passive income, idle assets,
3	Debt	Instalment, home loan, vehicle loan, sticky cost, debt mindset, over debt,
4	Cost Management	Overspending, financial management, frugal living, run out of money,
5	Saving	have no saving, motivate to saving, emergency funds.

Source: Author's design (2020)

Most of the cases which arose in the answers are about a debt problem. Here is one of the debt problems that was related to their mindset of the debt:

> "*My auntie was in debt because of the problem of not being able to manage the debt, she borrows money from relatives, and pay that debt with another debt from other family or relatives. That is happening for almost three years, and now she has huge debt from family and relatives….*"

Another arising problem occurs because people have no idea what the concept of sticky cost is when they have vehicle loans:

"I have a brand-new vehicle with a very cool model, and all my friends admire it. I just realised several months later that the cost of fuel, the highway price, and the maintenance price are so high, and I cannot afford to pay it all. So, I have fallen into another debt to pay that cost…."

Housing loans are also one of the most common problems that the middle-class face in this research, as they have no idea about the increasing price of the house when they deal with housing loans:

"I made a deal with the developer that built my first house, the price in the leaflet was 350.000.000 IDR, but when I made a deal with them and required 20-year loans, it felt so cheap, as the instalment was so small. So, I am good with it. Several years later, I realised that the instalment I pay mostly for the interest and the principal debt that I should pay is still big. I know that the total payment that I should pay increased incredibly high with a total 600.000.000 IDR total…."

The second most common problem that arises is the cost management and saving problem. The primary problem that falls into this topic is related to their ability to manage the money:

"I have 15.000.000 IDR salary each month, but I do not know where the money goes. In the middle of the month, I always realise that I should use my credit card for daily needs, as the salary is already gone. I try to hold my consumption, but it is difficult as many of my friends and relatives always ask me to go out and use brand-new goods and we always meet in a fancy restaurant that normally we try each week…."

One of the most common problems in managing their money is their ability to identify the essential goods and non-essentials goods, they often fall to consume a product just because it classifies into promotions deals such as flash sale, black Friday, etc., while actually they do not really need it:

"In a day of a big sale promotion, I cannot resist buying many promotion goods in the online marketplace. They always give us interesting promotions in the first week of each month, and I buy many items. It is a pleasure for me at first, but I realise after several months that I have no savings at all. Even I am still single, I cannot save much money…."

Indonesians are not familiar with insurance. Most people use national health insurance, which only covers essential services in medical health. Many people go bankrupt when their family get seriously ill and cannot afford to pay the hospital cost for them:

"We are financially good and well previously, but after my parent got ill and he needs medical treatment that cost a huge amount of money, I realised that all my savings

account has gone for covering the treatment cost in the hospital. That all my savings account was still not enough to pay the treatment, then now we have huge debt because of that disaster. I realised that I should have had emergency funds if I do not have insurance to cover any unpredictable disasters that happen to my family…."

Overspending is happening in every social class either they are middle- or low-income families, they both have the same problem; they cannot hold their willingness to spend more than they can afford:

"I work in a state bank, I have above average salary and have a credit card as facilitation from the company. My friends and colleagues influence my spending each month as we have dinner outside a lot and spend a lot of money on expensive brands. I just realised that mostly my transaction is using a credit card, then I was shocked that I have a huge amount of credit transaction that I should pay. Now I feel so bad, because I have no savings at all compared to my friends out there…."

In Indonesia as a developing country, we have a massive wave of a financial technology start-ups. This makes the government work challenging to make regulations for that as the cases of investment fraud is everywhere there:

"My father got investment offers from people who claimed they could give return 20% each month from their investment. In the beginning, the cash flow was good as the return money came in for three months. Then many people came to invest together with huge money. Then in months 5 and 6, they were not paying the return, and we could not contact them. It was already one year ago, and they are gone, so is our money…."

Nowadays, many people create an online investment education platform in Indonesian. They use social media like Instagram, Facebook, etc. It is an excellent platform to learn financial knowledge, the problem is the social media is not enough to deliver all the investment materials comprehensively. Then many people fall into an investment with a terrible financial foundation:

"I invest in the stock market, because I read all-stock investment materials from social media, as I do not have money, so I borrowed money from the online lending platform. However, my investment is going badly, the stock price that I own falls, and I lose much money. I sold the stock at a very low price, and now I owe money to the online lending platform with huge interest…."

In the middle-class families, there are many people with an idle asset that have no idea how to monetise their asset into passive income:

"My family have many idle lands in the village, but have no idea how to make passive

income from it. My father only checks the land once in several months. Some of the villagers use the land even without an agreement with my father as the landowner. I also have no idea how to make revenue from it…."

"I have some idle cash that is available to be invested to investment instrument, but until now, I have no idea where to invest, as I do not have any knowledge of it. It is already three years, and the idle cash is still in my bank account. I need some investment knowledge to understand how to manage it to become my passive income…."

The last problem is that people tend to have no financial plan, they have no plan for their income and investment in the future:

"One of my friends spends a lot of money on unnecessary goods such as a brand-new motorbike just because it is popular in a short period. He does not need it as he already has another motorbike and car. He spends on that thing, because he has no plan and target on their financial plan in the future, then he easily distracts to spend on non-essential goods…."

After classifying each adult's answer into several financial topics, the next stage is to count the total cases arising from each topic. The four main topics classified in this research are debt, investment, financial planning, cost management, and saving. Table 10 describes the summary of total cases that arose from the adults' answers.

Table 10. Number of cases by topic

No	Financial problem	Number of cases	Percentage
1	Debt	142	31%
2	Cost management	107	24%
3	Investment	78	17%
4	Financial planning	72	16%
5	Saving	56	12%
	Total Cases	**455**	**100%**

Source: Primary data of author's calculation (2021)

To get a more comprehensive point of view, this research also examines student perceptions about financial education. This research collects student expectations on topics on financial education and their outcome expectation from financial education. In this part, students could answer with a short answer (1-3 words) to answer their expectations in learning outcome and topics expectations. Three options were given for student learning outcome expectations and three options for student expectations on topics. However, the instrument gives the option for students if they would add more answers. The result of student answers is summarised below in Table 11.

Table 11. Summary of student preferences on financial education

Student Topic Preferences	Student Expectation on Learning Outcome
Investment (35%)	Financial Independent (35%)
Money Management (30%)	Improve revenue (30%)
Saving (23%)	Solving the financial problem (24%)
Debt Management (12%)	Manage daily expenses (10%)
	Early retirement (1%)

Source: Primary data of author's calculation (2021)

Table 11 shows that most students have the highest interest in learning about investment, they are interested in making a side income from investment. They also expect that by learning investment, they could become financially independent. Money management is the second most popular topic that students expected to learn. They want to know how to manage their own money and for their family. Saving is also interesting for university students as they already understand the beneficial impact of having a saving account. Debt is the last topic they expected as students rarely make a debt in their age. Some students are interested in debt topics if they have a debt problem with their family or relatives.

Most students expected to become financially independent after learning from financial education or at least know how to become financially independent. Improving revenue is also interesting for them, they expect they could have another side job or investment to increase their annual revenue. They also require the financial education to solve their financial problem in the future. Students are also curious about the knowledge to manage the routine expenses. The least what students expect from the course that it could deliver knowledge about early retirement.

To receive more comprehensive knowledge of the adult financial problems, triangulation data collection was done. Both questionnaires and semi-structured in-depth interviews were used to collect data from participants. Several open-ended questions were prepared that the interviewees had to answer. Interviewees were strictly selected by purposive sampling. To collect participants in this stage, there were several requirements which should be met for in-depth interviews: 1) to be a certified financial advisor, 2) to have experience for more than four years as a financial advisor, 3) have more than 50 clients aged between 30-50 years old. Table 12 describes the details of sources for in-depth interview, ten independent financial advisors gave us input of what is the financial problem that adults face in the age between 30-50 years old.

Table 12. Results if in-depth interviews with independent financial advisors

Name of People	Age	CFP	Work Experience	Their suggestion of an adult financial problem
A	43	Yes	10 Years	Debt, Expense Management, No Investment
B	38	Yes	7 Years	No saving, No emergency funds, No Investment
C	49	Yes	15 Years	No Financial Planning, No financial Knowledge, Consumptive Debt
D	47	Yes	17 Years	Hedonism, have no financial plan, have a huge debt
E	38	Yes	6 Years	They have no idea that they know nothing in finance
F	46	Yes	13 Years	Lack of knowledge in debt, investment and saving
G	42	Yes	12 Years	Massive debt, no saving account
H	32	Yes	5 Years	Hedonism
I	50	Yes	19 Years	Money management, have no knowledge in finance
J	45	Yes	14 Years	Lack of financial knowledge, expected instant result, have no financial plan.

Source: Primary data, own calculation (2021)

Table 12 shows the summary from an in-depth interview with ten independent financial advisors. They suggest that there are several topics or financial problems that commonly happen in adults. Each advisor suggests one or more main financial problems faced by adults between 30-50 years old. In summary, the problems that arises from adults based on independent financial advisors are listed in Table 13.

Table 13. A summary adult financial problem from CFP

No	Problem / topic	Number of suggestions
1	Debt	5
2	Lack of Financial knowledge	5
3	Expense management/hedonism	4
4	Investment	3
5	Saving	3
6	Financial Planning	3
7	Emergency funds	1
8	Expected Instant result	1

Source: Primary data, own calculation (2021)

Table 13 shows that the most common adult financial problem that arises in the counselling session with advisors is debt. Lack of financial knowledge has been suggested by 5 advisors as they found the root problem of client confusion in making financial decision is because they have not got enough financial knowledge. Expense management listed as number three, because mostly client needs help with tracing their spending habit. Investment, saving and financial planning is the next topic, because they faced clients who fell into fake investment, needed help to start their saving account and needed help to make a financial plan for their children.

To sum up the results of the first stage of this research, in this stage 844 valid respondent from the questionnaire and ten in-depth interviews were collected. They consist of 455 adult participants, 389 students and ten independent financial advisors. Adult participants have been asked about their financial problems, and students were asked about their preferences in financial education. Five main financial problems were found from adult participants, four financial topics, and five learning expectations from students. To synthesize all these results, this research tries to connect adult financial problems, students' expected topics, and students' learning outcomes into several topics in financial education. Then we found there are debt management, saving, investment, expense management and financial planning topics which arise in this research. These big topics are the primary concern in this research that we found from adult financial problems. Table 13 explains the details of the keywords that arose from participants' financial cases, student expectations for topics and learning outcome into five main topics and how to fit the topic classification with the suggestion from an independent financial advisor. Here Table 14 describes how to fit each other to the topic that we propose for innovative financial education.

Table 14. Summary of recommended topic financial education

No	The recommended topic for financial education	Keywords from adult financial cases	Students' learning outcome expectation	Students' financial topic preferences	Problems suggested from Independent Financial Advisor
1	Debt Management	Credit, Loans, Instalments	Solving financial problem	Debt management	Debt
2	Saving	Reserve Funds, Idle Money, Emergency Funds	Financial Independent, Solving a financial problem,	Saving	Saving, emergency funds
3	Investment	Side Income, passive income, maximise idle funds	Financial Independent, improve revenue, early retire,	Investment	Investment, expected instant result
4	Expense Management	Difficulties manage money, run out before the end of months	Financial Independent, solving a financial problem, manage daily expenses,	Money management	Lack of Financial Knowledge, Expense management, hedonism, expected instant result
5	Financial Planning	Have no plan, have no financial target.	Financial Independent, early retire.	-	Financial Planning

Source: Author's summary (2021)

4.2. The results of the third stage

The aim of the third stage is to develop customized financial education material. This financial education aims to promote good financial behaviour and to prevent financial disasters. As soon as students graduate from university, they will make many complex financial decisions, they need sufficient financial knowledge to make a better decision. Here are some of the materials that we used in financial education. To develop the material that is tailored for specific participants, in this case for university students, we choose **topics which are close and suitable** to their daily financial decisions. The material also delivers bad and good stories **to motivate students to change their current behaviour**. We also teach students the typical **financial decision bias and some financial misconception**s in the financial decision. Next, we discuss the details of the material used in this research.

4.2.1. Tailoring for specific participants

The students participated in four online meetings: financial planning, cost management and saving, investment and debt classes. We delivered many examples that were easy to replicate by the students. Here are some of the materials that we delivered in the class. In the financial planning class, we taught students how to assess their financial condition. We help them to measure their own financial health. We taught students that we were in a healthy financial condition when the annual revenue is higher than the annual cost and when our asset is higher than our liability. Then we taught students how to identify their potential asset (tangible and intangible) and how to monetise it into side income. We also helped them to create necessary financial planning for 1 to 3 years, then the students could make a detailed plan financially.

In the cost management and saving class, we taught the students some of the root problems of overspending behaviour. We explained some practical ways to avoid that problem, such as how to avoid impulse spending, toxic friends, miscalculation of debt decisions, abuse of credit cards, and having no financial plan. Each of the root problem was followed by some solution to avoid it practically. Then after understanding that bad decision, students were expected to avoid that behaviour. The students also learned the importance of spending less than their income. We were not only teaching them the importance of it, but also taught them the easiest way to live below their income power. We also taught the students how the easiest way was to make a personal budgeting. The personal budgeting is how to spend, invest, and save the current money and how to grow the current asset.

In the investment class, we taught them some of the investment principals. We also taught them the characteristics of fake investment, then the students could avoid a fake investment. We taught the students the practical way to start their investment. We taught the students the concept of micro-investment, collective investment, and some of the instruments for that concept. With the development of financial technology, it is possible to become an investor even with a small amount of money. We gave them an example of micro-investment such as stock investment, agriculture, and livestock investment.

In the debt class, we taught students the concept of consumptive debt and productive debt. Then the students could differentiate when the debt becomes the source of the problem and when the debt could be beneficial for us. As most participants will graduate from university and start their working life, they soon must decide to buy a house and a vehicle. Then we taught the students about how to own a house and vehicle without loans.

4.2.2. The case studies of bad financial decisions

Listening real bad financial cases from others could increase the awareness of financial issues. The loss aversion concept has been used in this context to motivate students to change their behaviour. The basic principle of loss aversion can explain how the information frames into loss condition could be more effective than rewards in motivating people to change their behaviour (GÄCHTER et al., 2009). This research applied the loss aversion concept to explain cases of personal finance that collected from the first stage. The cases are explained as an example in the class. Here is some story that we used as a case of poor financial decision in personal finance.

The first case is about the illusion of salary. The story tells us about the experience of a young couple had one child. They feel secure about their financial condition, because they both have above-average salaries compared to their relatives. Unconsciously, they were doing excesses spending using a credit card. Each month they feel okay, as the salary could cover all their bills. But they have no idea that they have no savings account and emergency money. One day, their child fell sick, and they went to the doctor. Then the doctor found that the child has cancer and need extensive treatment that was not cheap in an international hospital. The wife decides to resign from the company as she should be taking care of the child to the hospital and in the house. Now the income is cut in half, but the debt is still huge. They get shocked financially and start to sell their branded handbag and vehicle for the child's treatment. They even move to a smaller house, as they cannot afford to pay the mortgage, and they should sell the house under-price to pay the loan to the bank. The lifestyle changes drastically, because of the sudden continuous cost, income loss, and no emergency money to cover emergency conditions they face with. Now they restart their financial life and start to make their plan financially to secure their financial condition in the future. They realise the importance of emergency funds and invest for their financial backup; they also change their spending behaviour. They become more careful and mindful in spending their money.

The second case is about toxic colleagues. This story is about a single woman who works in a multinational company. She is working in the capital city of Indonesia and comes from a small city. Several months after she has been working for a new company, she realises that she should catch up with their colleagues' lifestyle to be accepted in their circle. Hanging out every weekend in an expensive restaurant or spending their money in a brand-new fashion are part of the social acceptance in their social life. In the beginning, she could resist that behaviour, but she slowly gets interested in the colleagues' lifestyle as time goes by. She starts to overspend her money month by month. When the company gives the facility a credit card from their bank partner, she becomes happier because she could buy something that she could not afford previously. She started to buy luxurious brand-new apparel. One day she meets the man she has been dreaming of; she falls in love and start a relationship. The short story is that the man starts to become more serious and talk about his financial condition and plan their life financially in the future. Then the man realises that the women has an excessive debt in credit cards and other fintech applications. The man asked her to pay all the debt before getting into a more serious relationship as he does not want to have a marriage with that burden of a massive debt. She feels offended by that request and decides to break up with the man, and she gets back to the toxic society. The short story is that the woman still must work to pay all the debt has not even been reduced a little bit for the last five years. She realises that she is in trouble financially after meeting with another colleague who told her she should move on from her current behaviour and seek advice from a financial advisor to solve her debt. Now she starts to understand that the main problem for their excessive debt is her toxic friends; she starts to move and pay the debt slowly and sell the luxurious apparel that she does not even need.

The third case is about fake investment. A middle-aged couple in the pre-retirement has enough savings account for their retirement. They are actively searching for information about potential investments for their retirement. They find information on the internet and social media about the potential investment with a significant monthly return rate. They are interested in the investment and check that they have an attractive website and social media. In the short story, they discuss with a person in charge of that investment. Then one day they have been invited into a small meeting to discuss the details about the investment, they are not the only one participant these were more than 30 people who come and join the meeting. The event organizer rented a small room in a famous hotel in a small city and invited all the potential investors. They listen to the presentation and discussion for two hours, and in the final hours, they invest all their savings account into that business and leave nothing. They expect to get 10% each month from that investment as they promise the minimum of 10%, and maximum of 40% each month. In the first months, they received the return, but after that the organizer said that the return would get higher if they re-invest the return into the business. Then they re-invest the return and are expected to receive a higher return in the third month and so on. They keep communicate to explain the business condition, but everything starts to go wrong at the beginning of the sixth month. They asked some of the returns to cash out to their bank account as they need money to buy something. They start to contact them, the couple looks for office's address, and they find nothing. They start to worry and report to the police in the eight months after they invest. The police told them a similar report about those cases in the city and from another city. The couple started to panic and asked their child to help with that issue. The child helps to find out the person who manages the money but still gets nothing for the next 12 months. Now all the children help each other to cover the living cost of their parents that already broke because of the fake investment.

The fourth case title is “be aware of your family financial knowledge”. This is the story of how we could be broken financially because of our family financial decisions. A typical young couple who works in the capital city of Indonesia is stable financially. They establish the emergency funds and have a small investment that generates routine cash flow. Everything changes after one of the parents fall into a fake investment. The parent borrows the money from the bank and uses all their money to invest in the fake investment. When they did not receive the return of the investment, they realise that they were being cheated. They start to sell their assets such as property, vehicles, gold, etc. However, all that money did not cover all the debt they make in the bank. Then they borrow money from colleagues and fintech applications to pay the debt in the bank. Then they realise that the money they borrowed from the bank already has tremendous interest and penalty as they overdue the payment. The condition is getting worse, because the fintech application charges them with higher interest and higher penalties. One year later, the parents told the condition to their child and asked for help from their child. They already have multiple debts, and the debt raises from 300 million Indonesian Rupiah to 850 million Indonesian Rupiah right now. As they only have one child, then the burden of the debt falls into the only one child. The young couple suddenly has a massive debt from their parents’ bad financial decisions. The young couple now must change all their plan financially as they have sudden debt from their parents’. They also must cover the daily parents’ needs as they are already in the retirement and have no income.

The story was used in this research to increase participants' awareness that financial disaster could come to their life. The story enhanced the importance to have sufficient knowledge in personal finance. Participants received bad financial stories, but we also provide them with the solution to avoid financial disaster. This research benefits from making the right financial decision in financial planning, cost management and saving, investment and debt. We do not only explain the benefit of good financial decisions, but we also teach them to make a good financial decision step by step.

4.2.3. Real cases of good financial decisions

Besides telling the students stories of financial disasters, we also provided the participants with examples of **good financial decisions**. The students received a good financial decision story in four financial topics. The example of good financial planning, the benefit of frugal living, the best friends of investment, and an alternative way to own a house and a vehicle.

The first is about the good financial planning. The story of two people who work for the same company start with the same salary and almost similar economic background. They both were close friends, one of them learned and was interested in financial planning, while the other was not interested. Rudi is the one who is interested in personal finance and spend some of his salary to learn about personal finance, while Abby is not interested in personal finance and just going with the flow of her salary. The short story is that Rudi understands the importance of financial planning and starts to do his financial planning. Rudi understands clearly from the plan that if he works as a regular employee, he will reach his dream car, house and life in more than 40 years. Then he decides to grow his skill, learns something productive new, and gets a part-time job in the next two months. Now Rudi has two sources of income, from the regular work in an office and his part-time job. In this condition, Abby still works and still is a close friend of Rudi. The difference is that Rudi already settles his emergency fund and starts his investment in the next six months, while Abby only has one month extra in her savings account. Rudi already told Abby that he should learn and change; unfortunately, Abby still believes that her condition is okay. Then four years later, Rudi decides to resign, and he establishes his own business that grows over the expectation. He started as a part-time job as a design consultant, and now he owns his design consultant firm. He has many big customers, and he owns all his dream house, car, and dream life. Rudi plans his life and plans it financially; he calculates how to reach his dream financially and achieve it.

After that story, we teach them how to check their financial condition. The output of checking financial condition is that they understand if their financial condition is healthy or not. Then we teach the students how to plan financially with a growth mind-set. So many people teach financial plans, but with a fixed mind-set; they only teach what money or revenue we have right now and plan it in the next several years. Since people are dynamic and everything constantly changes, we must be more open to another opportunity to grow our income. Then the financial growth plan teaches the students to identify idle assets and resources that have not yet been exploited. We teach them to identify and teach them to monetise those resources. Then we teach them how to plan financially with growing income and growing revenue.

The second story is about **the benefit of frugal living**. We told students the story of every multimillionaire reaches his/her success financially. They could easily reach financial independence. One of the critical factors that they still do when they are young is that they always live under their ability to make money. The cash flow of that millionaire is always positive as they live frugally. They never spend the money on an unproductive good. They always spend below their income. Some people think that rich people spend much money, while in fact most of them only spend 20-40% of their income and re-invest their income to another investment instrument. They could live frugally, and they live frugal even since they were a kid. Then by life frugal, we could easily save our money and invest our money into a more productive asset. We have an active investment that generates actual cash flow annually and potential gains from the investment by having a productive asset. Everything is possible if we have spare money, and one of the easiest ways to have spare money is by spending less. The first way of having spare money is by increasing the revenue already explained in the financial planning way.

After students understand the importance of frugal living, we teach them some practical ways to live frugal in their daily life. We told them several tips of living frugally that could be applied right away. We told them about essential and non-essential goods, rational spender, avoid toxic friends, productive and consumptive spending. Then we teach them the importance of emergency money and how to calculate it. Each person needs a different amount of emergency money, and we should calculate based on their risk. The risk from their family, health risk, etc. Then the last discussion is about growth budgeting. We discuss how to make a growth budgeting, the difference between conventional and growth budgeting, and why it is vital to make a growth budgeting.

The following story is **the best friends' investment.** The story of two couples who start investing in a different time. One of the families start their investment when they were 30 years old (couple A). The other starts the investment at their nearly retirement age, 50 years old (couple B). The younger couple starts early with a smaller amount of money that they invested. They invested in one of the most conventional investment instruments; there was a retail government bond. The older couple starts investment as a preparation for their retirement. They start the investment with a larger amount of money as they prepare the investment funds for their retirement. The older couple also invested in a retail government bond. Both have a big difference in their retirement ages (55 years old) in their investment account. Couple A already invested their money in the last 25 years; they have a lot bigger money than couple B that just invested in the last five years. **Time is the first best friend of our investment.** Compound interest makes money grow faster than just putting it in the savings account. So, the best investment choice is the investment that we have knowledge of and can start right now because time will help it grow. The effect will be more significant if they know an alternative investment that could provide them more than a 30% annual rate of return. Then here are some examples of micro-investments that they could start as soon as possible and have a rate of return of more than 40% annually. Invest in agriculture, livestock, stock market, friends' business, and micro venture capital. The only rule to get that return is to understand that business, and then we can assess the potential rate of return. If we do not have sufficient knowledge of it, do not ever participate, because we also could lose all the money. **So, the second-best friend of an investment is knowledge**; we could fall into fake investment easily without that knowledge. Next, we discuss the three main principals of investment that we should know before allocating our money. The three basic principles are: 1) understanding financial forecast / financial report, 2) calculation is more important than perception and 3) checking the company's legality. Then we discuss the characteristics of fake investment that commonly arise in Indonesia. Last, we discuss some other issues in investment, such as investment in fintech, and gold is not an investment and how investment is a tool of financial independence.

The last good story is an **alternative way to own a house and vehicle without loans**. This story is explained in the debt management session. Two of the enormous debts that commonly Indonesians have is house and car debt. We teach students that there are several alternative ways to own a house without any loans from the bank. We provide them with an alternative with the easiest way to own the house without loans. The main problem of people who cannot afford to buy a house for cash is that the standard salary is still low compared to the house prices. 80% of people in Indonesia still buy a house using loans from the bank. The problem with housing loans is that people pay a lot more than the actual market price. So, if they do not want to be ripped off by the bank, they must learn how to own a house without bank loans. For comparison, the actual price of the house if we buy it cash 320 million Indonesian Rupiah, with the loans of 10 years, the money that we should pay is 417 million Indonesian Rupiah and for 20 years is 558 million Indonesian Rupiah. The difference between paying it in cash and with loans is already huge. Then we told them the actual cost of goods sold of that house. The COGS of the house and the land is 250 million Indonesian Rupiah. Then they realise that the margin is more significant after understanding the COGS of one house. Then we teach them basic knowledge of how to own a house without loans. We could start buying a piece of land first, because buying land is cheaper for most people. Then we teach them how to choose the constructor to build up the house, and we teach basic knowledge to monitor the constructor to reach their goals. Based on our calculation, we could start saving money in the first year and buy land in cash, then with the most average salary in Indonesia; they could start building the house with the constructor in the third year. The price could reduce a lot if we do not use a developer, and it is possible in Indonesia if we have sufficient knowledge about managing house builders. Without the developer, the COGS that previously 250 million Indonesian Rupiah could reduce and get the house for 200 million Indonesian Rupiah.

An alternative way to own a vehicle without loans. Most Indonesian buy a new vehicle with a loan. There were several reasons why they need the brand-new vehicle at the time. They did not afford to buy it in cash. We will not discuss their reasoning; we will discuss an alternative way to acquire the vehicle without loans. We inform the students that credit transactions to buy the vehicle will give them a double loss. The first loss is that the price of credit vehicles will increase a lot more than cash. The second loss is that the vehicle has a depreciation cost: the vehicle's economic value decreases each year. So, buying a brand-new vehicle with loans is irrational if they buy it for personal use. Then teach student by comparing the situation between buying a brand-new car directly and delaying it for 2-3 years. The calculation results show that buying a second-hand vehicle right now and saving your money in the next 2-3 years could be more beneficial for them. To reach that, they should save the amount of money they spend on credit transactions into a saving account and in three years, they could buy a lot better car with cash than buy it with loans. The depreciation cost each year of using a leased vehicle is also much higher than the depreciation of a vehicle that we buy in cash.

4.2.4. Avoiding financial decision bias

We taught the students how to avoid financial decision bias. The **mental accounting** financial decision bias is quite challenging to avoid. Each case of mental accounting needs a different solution. For example, Mr. and Mrs. H spend their leisure time with fishing. They got many fish and travelled back using a small aeroplane. When they arrived at the destination, they realised that the fish they got is missing and they got compensation of 300 US$ for the loss. Later, on that night, they spend 225 US $ in a fancy restaurant for dinner. It is their most significant spending only for one-night dinner in the restaurant (THALER, 1985). This bias works as people tend to label some of the money, they perceived labelling some of their money based on how they get it. The previous example labels the 300 US $ compensation as a gifted money that they never expected before. Then they could easily spend it because they label it as "compensation of losing". People could label some money as gifted and earn. When people label themselves as gifted, they tend to spend it easily compared to the money that they labelled as earned. People label regular salary as a earn money, because they should spend their time and energy for work for five days a week to received it. While people label as a gifted, because they did not expect that money. The other example is the spending behaviour of lottery winners. They never save or invest it; they always spend it and back to broke financially not long after getting the lottery prize, because they label the lottery money as a gifted money. This bias is frequently happening in our daily life; that is why it is important to teach financial education that induces financial decision bias material in the discussion.

The feeling loss bucket of fish from the couple that just arrived from their vacation should be compensated by something that makes them happy. The spending they made in the restaurant is reasonable as they should compensate themselves for the loss of their fish. They compensate for the feeling of loss by dinner out in the restaurant. The problem is that the amount they spend is irrational. If they understand that they only need to compensate for the loss, they could buy a similar fish in the market just like what they lose or have dinner with more reasonable spending. One of the ways to reduce the probability to fall into impulsive spending that driven by labelling our source of money is we have to make a detail financial plan. People with good financial planning could reduce the intention to fall into impulse spending because they have a financial target that they should reach in the specific time frame. If they received some money as compensation for losing something, they could easily put the compensation money into some account that they prepare financially. For example, 300 $ might be not big enough, but it could be put into a bond investment account. Then when there is an opportunity for a government bond issue, they already have money to prepare for that. People without a financial plan will not have that kind of preparation then they could easily label the compensation money to be spent on compensating for their feeling of losing their goods.

The third is how to avoid **procrastinator bias** in financial decisions. There were several reasons people fall into a procrastinator, there are: 1) initiation difficulties, 2) lousy implementation, and 3) stagnant maintenance mode. The causes of difficulty to start their financial plan are:

a. they lack financial literacy, so they do not know where to start,
b. they fear of embarrassment that they have financial problems,
c. choice overload leads people to stay doing nothing, etc.

To avoid initiation difficulties, people who fall into procrastinators should be given an easy example to mimic and replicate. The example should be easy to execute on the day they understand that example. If the example needs a lot of effort and resources that they do not have right now, they will fall again into initiation difficulties. For example, it will be easy for us to teach people about financial planning and financial review, as they could start as soon as they understand the knowledge. They could measure their financial condition and make plans to achieve it. On the other hand, if we teach university student with real estate investment, high probability they will fall into procrastinator because the resource not enough to start real estate investment. The opposite, if we teach university student with micro investment which need small amount of resources, small probability of student fall into procrastinator because it is easy for them to start right away. The procrastinator still could be existing even we already start the new behaviour. People that already start executing their financial planning still could be seized by procrastination. In the implementation, some people execute with a stick to the default mode. People prefer to stick to the default mode of 3% for the 401(k) account in the US. At the same time, they should assess their financial condition and make a better choice for their retirement plan. Even people already initiate, still does not mean they avoid procrastinator bias. The implementation could be lousy because they are relying on the decision in the rule of thumb that socially acceptable. People believe that some values in the financial decision are good because so many people make a similar decision. While they do not realise that less than 2% of people become millionaires, because they were not following the common belief in the financial decisions. Following the rule of thumb in society it is sometimes good, but the rule of thumb sometimes oversimplifies the actual condition. People who rely on the rule of thumb mostly do not spend their time reviewing their financial condition and needs, so they only follow the most common belief. An example of common belief which is not totally true is property is a haven investment. In our courses we teach them that not all property is a haven investment, some property is bad for investment. We teach them how to select a good investment property and avoid bad property.

One of the applications of the concept of **loss aversion** is people's decisions in stock investment. Many beginners in stock investors do not acknowledge a loss until it is realised; they held the stock even when the price fell. They hold it to avoid psychological pain when they sell the stock in the loss condition. One of the ways to avoid that decision bias is that investors should use a stop-loss order to minimise their loss in the stock market. Another side of loss aversion, this bias could lead people to become over-conservative. They do not want to take any risk as they are afraid to face the potential loss when investing in the higher-risk investment.

However, the investment is about math; if we calculate it right, then it is not a too risky investment. People classify some instruments as too risky investments because they do not have sufficient knowledge of that investment. For some people, cryptocurrency is too risky as it has no underlying asset, but some become a millionaire because they know when to join and understand when to exit. They calculate the risk; they have valuable information, and they execute at the right time. The problem is that people do not know about calculating and are making investments because others were also making the same investment. Then, when the price falls, and they lose their money, they label it as a risky investment.

The solution is to avoid the possibility of loss aversion in investment. People feel more pain psychologically in losing than the pleasure of gaining in investment. People perceived pain in the investment loss is because they only expected gain and not ready of loss in their investment. Moreover some people investing by using the money of his/her emergency funds or saving account and not using the idle money. We told the student one of the rules in investment, we must perceive that all the money that we invested in already lost in the beginning, then if there is a return, they could perceive it as a bonus, and if it is lost, it is already expected. Then they will be ready to face whatever will happen in the future of their investment. Then it is critically important to use idle money in investment. Do not ever use the saving account and using debt in the investment. If we forced our investment using debt or saving account, if the investment went wrong, we were not ready for the loss. However, if we use idle money, which is all lost, we will not have any problem. Then we could easily avoid loss aversion.

We also teach students the knowledge on **how marketers used tricks to increase impulse buying.** These are for example flash sales, free shipping in limited time, limited-time deals, and cross-sell and upsell products. We teach students that their spending decision in this case mostly falls into an impulse buying decision. People just want to get a good deal at a reasonable price, they do not care about the product's usability. They are in a rush because of the limited time they offer, and people were only thinking of getting it now as the best deal or losing it. The pleasure they received when they thought it was a good deal is what they want to reach in this case. So, we teach them the rational spending behaviour. Rational spending behaviour is when people spend based on their needs. We teach the students to identify and separated between their needs and desire. So, they could identify the most rational goods to buy.

The next is students learn some **bias in investor behaviour**. Investor behaviour is the field that explains the decision by combining the topic of psychology and investing on a micro and macro level (BAKER and RICCIARDI, 2014). A study in investor behaviour examines the mental process and emotional issues in the investment decision. Here are some of the example investor biases that commonly exist as a beginner investor. First is **representativeness,** this bias labelling arises in the stock investment. People believe a stock is bad or good, because they believe it is a good or bad company. In the stock market, price volatility is mainly influenced by the aggregate investors' psychology. It means that a good company does not usually give us gain in stock investment. The other example of representativeness bias is that most people believe that property is a safe-haven investment. The fact is that it is not, some of the properties give a small return, while some of them were depreciated a lot. Second, **familiarity bias** is the tendency of the investor to put their money into a place that they are familiar with. For example, people display a preference investment in a local asset with which they are more familiar and would not diversify into a new investment instrument. This bias could increase the risk because the investor has no diversification in their investment portfolio. The main problem of this bias is that people tend to use intuition than a calculation on their investment. They need to broaden their investment knowledge to understand that there is another profitable investment than what they know currently. Third, **worry** is another bias in investment. Previous research found that investing in the common stock market has a higher relation to worry than people who invest in bonds (RICCIARDI, 2011). The worry bias could lead investors into anxiety. Which could influence investors' daily life. They can be unable to sleep well at night and watch the bar chart of their stock investment each hour which are the symptoms of people infected with this bias. This bias arises because there are no match between investor risk preference and investment instrument risk. To solve this bias, investors need to understand their risk preference, set up the goals that align with their risk preference and understand what kind of money they should use in investment. Without that knowledge, the investment will be followed by anxiety for a beginner investor. Fourth, **anchoring bias** in the investment decision. An investor who falls into this bias tends to believe in subjective reference points to make a future judgment (BAKER and RICCIARDI, 2014). The first information that investors received could be their anchoring point to judge in the future. For example, people that first get information about the high volatility risk of the stock market would set the stock market as a risky investment. They set up the stock market as a risky investment, and they tend to avoid stock investment. This bias avoids other fact that there is also an option to choose low-risk stock in the stock market. Fifth, **self-attribution bias** investors tend to attribute successful gain comes from their action, while bad outcomes come from external factors. An investor with self-attribution bias has overconfidence in their financial decision, and it is not suitable for an investment decision. Investment decisions should rely on calculation and objective judgement. Overconfidence could lead investors to make irrational financial decisions as they could forget to measure the risk in their investment. Sixth, **the trend-chasing bias** makes investors believe that historical performance is a good indicator for future performance. While previous research found that from 1020 mutual funds managers, 95% could not maintain their performance compared to the last 12 months (SOE and LUO, 2012).

We also taught the students the six most common misconceptions in financial decisions. Several myths that people believe as a valid information, but the fact is not entirely true. **The first misconception is that all properties are profitable for investment**. Some properties, such as an apartment in a huge building with hundreds of apartments, could be a problem if you invest in that property. As hundreds of people also think the same, they want to buy the apartment and rent it to someone else. When the supply is overload, and the demand is low. Then with the basic economic supply and demand law, the rented price would be low because of the overcompetitive. **The second misconception is that many people believe that they prefer to pay the housing instalment than spend on monthly rent.** The fact that with housing instalment, the house price increased significantly compared to the market price. We will spend a lot more money if we buy it credit and pay the instalment monthly.

While we can save much money if we could follow the solution of owning a house without loans, just like what we teach them in the debt class. **The third misconception is that it is good to invest our money in our family or friend's business.** This misconception could be a big disaster if we only believe the business will run smoothly because they are our friends or family. People with this belief will avoid legal and formal administration that should be set up before the investment starts. Then when the bad things happen in the middle of the business, they have no preparation of exit strategy and the consequences. **The fourth misconception is that gold is a good investment.** The fact is that gold only protects our asset value and does not increase the value of our assets. Gold price only increases when the crisis and unstable economics was happening, such as economic crisis and health crisis, etc. While the fact is that commonly when the crisis happening, the inflation rate is increasing, which means the value of our fiat money is decreasing. So, the gold price never increases. The fact is that our fiat money decreases it’s valued each year by inflation. Based on that argument, we conclude that gold is a good hedging instrument to secure our assets in uncertain conditions. **The fifth misconception is that we can build a credit card rating by spending our monthly expenses with a credit card and paying it on time to avoid interest and penalty while our credit rating is increasing.** The fact that people cannot resist the temptation of the credit card limit each month. Slowly people will increase their spending in credit card until they exceed their spending power. At first, people will feel guilty, but people tend to justify their overspending behaviour and slowly pile up the debt as time goes by. Until they realise that they have huge debt and have no power to pay it back. **The sixth misconception is that only rich people could be financially independent**. The fact is, we only need to generate a passive income that could provide cash flow that covers our annual cost of living to be financially independent. To generate passive income, we need to have an active asset that could generate real cash flow each year. Then investment and cost management are some of the keys to reach financial independence. **The seventh misconception is 'life with going with the flow' as one of the Javanese philosophies.** Javanese is the most populated island in Indonesia with 145 million people, which is 55.6% of the total Indonesian population. People on this island have a local wisdom that it is okay to go with the flow in life. People who belief in this value will not plan for their life. People that have no plan in their life have a high tendency to have no plan financially. They believe that going with the flow is one of the values that their ancestor's belief and it already exists for a long time ago. This belief is contra-productive with the concept of financial planning, so before we teach financial planning, we should induce students with this misconception of this belief.

4.3. Summary of financial education material

Each material in this research is classified into four topics: financial planning, cost management and saving, investment and debt. Each meeting focuses on discussing one topic. The details of each topic are explained in Table 15.

Table 15. Summary of financial education materials

Topic	Summary of the materials
Financial Planning (60 minutes presentation 60 minutes practice and discussion)	Tailored for university students: - Teach the students to review their financial condition (5 minutes) - Teach the students to identify their potential resources and idle asset (5 minutes) - Teach the students to monetise their resources and asset (10 minutes) - Teach the students to create financial planning (10 minutes) - Motivate students to change their behaviour: - Inform students disadvantages of having no financial plan (5 minutes) - Inform students of the advantage of having financial planning (10 minutes) - Inform students the level of financial maturity (3 minutes) - Example of financial review and financial planning sheet (10 minutes) Financial decision bias: - The misconception of Going with the flow (2 minutes) Practice and discussion: - Student's practice identifying their idle asset and idle resources (20 minutes) - Students practice by creating their financial review to check their financial condition (20 minutes) - Student's practice making their financial plan to set up their target and goals (20 minutes)
Cost management and saving (85 minutes presentation 35	Tailored for university students: - Teach the practical way to save your money (5 minutes)

minutes practice and discussion)	- Budgeting for students (5 minutes) Motivate students to change their behaviour: - The benefit of frugal living (10 minutes) - The effect of toxic colleagues (10 minutes) - The importance of emergency funds (10 minutes) - The story of illusion salary (5 minutes) Financial decision bias: - The misconception of Financial Independence (10 minutes) - The misconception of Credit card rating (10 minutes) - Determination of impulse buying (10 minutes) - Mental accounting bias (10 minutes) Discussion and questions (35 minutes)
Investment (90 minutes presentation 30 minutes practice and discussion)	Tailored for university students: - The importance of investment knowledge (5 minutes) - Three main principles for investment (5 minutes) - Characteristics of fake investment (5 minutes) Motivate students to change their behaviour: - The best friends of investment (time and knowledge) (5 minutes) - The story of fake investment (15 minutes) Financial decision bias: - The misconception that gold is a good investment (5 minutes) - The misconception that it is good to invest money in our friends/family business (15 minutes) - The misconception that every property is profitable for investment (15 minutes) - Bias in investor behaviour (15 minutes) - Procrastinator bias and loss aversion bias (5 minutes) Discussion and questions (30 minutes)
Debt (85 minutes presentation 35 minutes practice and discussion)	Tailored for university students: - The importance of debt knowledge (10 minutes) - Peer to peer lending that led to bad debt behaviour (5 minutes) - Debt as a source of opportunity of the problem (5 minutes) - Productive debt and consumptive debt (10 minutes) Motivate students to change their behaviour: - Story of "be aware of your family financial knowledge" (10 minutes) - An alternative way to own a house and vehicle without loans (30 minutes) Financial decision bias: - The misconception of credit card rating (10 minutes) - The misconception of prefer to pay house instalments than rent a house (5 minutes) Discussion and questions (35 minutes)

Source: Author's own summary (2020)

4.4. Results of the fourth stage (experimental)

To validate the impact of customized financial education material, experimental analyses were used. Data collection was started by contacting colleagues in several public and private universities to offer this program to their students. We sent eight electronic letters to public and private universities as a targeted sample. Then, four institutions (two public and two private universities) responded and were willing to participate in this program. We contacted each university regarding this program. They spread the information and announcement about this program through the student community centres. To reduce the possibility of motivated response bias, this research collected both volunteers and mandatory participants. Both participants are important, as it could reduce the possibilities of only people that interest with financial education that participate in this course. This research did not rely on volunteer participants as it could limit the heterogeneity of the participants. People who volunteered to participate in this education could be people who already had an interest in the personal finance or have similar characteristics such as patience and diligence (LUSARDI, 2005), which could reduce generalising ability of the result into a more significant population. More than half of the students participated as a volunteer in the program, the rest participated because it was required from their lecturer in the university. It is essential to randomise and spread both volunteers and mandatory students who joined this program to reduce the possibility of volunteer bias. Block randomisation was used to classify students who would fall into the treatment group and control group. Half of the volunteer participants got into the treatment group randomly, and half of the mandatory participants joined the treatment group randomly. This classification was the same with the control group. Each student got an identification number to join this program. The details of this process are explained in Table 16. The identification number is unique for each student, then we can measure their progress during the study and four months after study. A total of 925 students were randomly divided into treatment and control groups. The treatment group included 457 students and the control group 468 students. Unfortunately, not all participants came and joined the four-week-classes. Altogether 862 students passed the requirement as they joined all the classes and filled in all the pre-test and post-test questions. The details of the student allocation can be seen in Table 16.

Table 16. Number of student participants

Stage of participant selection	Group	Student	Volunteer	Mandatory
Students register to participate	Total student registration	925	554	371
Each student is randomly assigns into 2 group	Treatment group	457	274	183
	Control Group	468	280	188
Students participate	Treatment	436	257	179
	Control	426	251	175
Total valid participants		862		

Source: Author's calculation (2021)

Students come from both economics and non-economics faculties to make the sample more heterogeneous. Heterogeneity of students' background is essential, as it will increase the probability of this result to generalise into the more significant sample in Indonesia. This research identifies heterogeneity of participants by measuring their gender, study background, hometown, parental income, and year of study at university. To explain the heterogeneity, here Table 17 explains the demographics sample of the experiment.

Table 17. Demographics of student participants

Demographics									
1	Sex	Male	365	42.3%	4	Year of Study	First	115	13.37%
		Female	497	57.7%			Second	164	19.02%
2	Field of study	Economics and business	397	46.05%			Third	205	23.78%
		Non-economics and business	465	53.95%			Fourth	378	43.85%
3	Hometown	Village	362	41.99%	5	Parent annual salary	< 3.000 US$	214	24.82%
		Town	235	27.26%			3.100 – 5000 US$	194	22.50%
		City	265	30.74%			5.100 – 7000 US$	189	21.92%
							7.100 – 9000 US$	178	20.64%
							9.100 – 10.000 US$	87	10.09%

Source: Author's calculation (2021)

The experimental process was done with an online platform. Several applications were used such as zoom meeting, Google Meet, Microsoft Teams and Webex meeting depending on what application is commonly used by students in their university. Pre-tests and post-tests have been used to measure student progress on each of the topics. The treatment group has four main topics: financial planning, expense management and saving, debt and investment. The control group have four topics as well: 1) risk, 2) interest and inflation, 3) future value and present value, and 4) bank service.

Each participant was required to join the four-weeks-class in each group (treatment and control). Each online class took 1,5-2 hours. There were 20 classes in total, so each class consisted of 40-50 students. Each participant filled in the pre-post-test of the questionnaire. We spread the link of the pre-test questionnaire 2-4 hours before the class begins, and for the post-test, we measured right after the class finished and 1-4 months after the class finished.

The impact of financial education was measured by comparing the scores of pre and post-test and control-treatment groups.

The number of valid participants who filled in all the questions of pre-post-test is different for each class. Even the total number of students who participated in the treatment group is 436 and 426 in the control group, but the number of valid data at each class is different. The reason is that some students came and joined the class but did not fill in either pre-test or post-test from the class or fail to pass the manipulation check that was given at the post-test questionnaire. Then we dropped that student from further analyses. Table 18 describes the summary of valid data on each class.

Table 18. Number of valid participants each class

Treatment Class	Number of students	Control Class	Number of students
Financial Planning	426	Risk	415
Cost management and saving	376	Interest, Inflation	358
Investment	412	Future Value, Present Value	406
Debt	385	Bank Service	368

Source: Author's calculation (2021)

The different number of participants in each class does not matter as the statistical analysis has been done on each class. Next, this research discusses the results of the fourth stage. The fourth stage aims to examine the impact of customized financial education and compared with the conventional financial education.

4.4.1. The impact of financial planning course on student behaviour

The first topic of customized financial education is about financial planning. The financial planning topic could be examined by measuring students' financial planning behaviour. This research compares the scores of pre-post-test of the treatment group and post-test of control and post-test treatment group to understand about this issue. The financial planning behaviour measurement with an objective scale ranges from 0 to 100. The behaviour was measured four months after the class ended. The score of financial planning behaviour was examined using students' behaviour. To measure students' behaviour, each participant was requested to make their financial review and financial planning. A financial review consists of the personal balance sheet (25 points) and personal income statement (25 points). Financial planning consists of a forecast annual income statement (25 points) and an action plan to obtain the income (25 points). Each item scored 25 points, if students made them all, they received 100 points.

Subjective measurement was also applied as an additional analysis that measure perception of financial planning and financial review. The measurement was done right after the financial planning class ended. The subjective measurement aims to understand participants' perceptions about financial planning and financial review and their intention to use that tool for their life.

Before examining the t-test, descriptive statistics were used to understand the basic information about this research data. Table 19 describes the summary of descriptive statistics from three groups (pre-test, post-test financial planning session and pre-test, post-test control variable).

Table 19. Descriptive statistics of financial planning session

Statistics descriptive	Pre-test treatment group	Post-test treatment group	Pre-test control group	Post-test control group
Mean	35.92	65.43	34.16	36.63
Standard deviation	24.16	24.03	29.80	31.26
N	426	426	415	415
Variance	583.51	577.40	888.17	977.12

Source: Author's calculation (2021)

Table 19 shows us the increasing of participants' financial planning behaviour on pre and post-test in the two groups (control and treatment). The average increasing score from pre-test to post-test in the treatment group (35.915 – 65.434) is 29.51878. On the other hand, the increasing score between pre- and post-test of treatment group (34.1566 – 36.6265) is 2.46988. The increasing of treatment group is higher (29.518) than the control group (2.46988). But the significant differences between groups can only be concluded using statistical analysis.

The first class was examined using a t-test paired sample to examine pre- and post-test in the treatment group, and an independent t-test was used to compare post-test on control and treatment groups. The results of the difference test is shown in Table 20.

Table 20. Pre-post-test financial planning

T-test paired sample	Pre-test	Post-test
Mean	35.92	65.43
Variance	583.51	577.40
Observation	426	426
P(T<=t) one-tail	0.000	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.000	
t Critical two-tail	1.966	

Source: Author's calculation (2021)

Table 20 shows that the score between pre-test and post-test of financial planning session is significantly different. The mean pre-test score is 35.91, and the post-test score is 65.43. The P-value for one tail is 0.0000, which is lower than 0.05 means that the probability of difference score from two groups is not random. The one-tail p-value means that one group is higher than another group. Based on the means in Table 20, the post-test score is higher than the pre-test score. This finding means that the post-test score is higher than pre-test score in financial planning class. Furthermore, this research compared the result of the post-test financial planning class with a post-test control group that received risk management material. The result of t-test independent sample unequal variances can be seen in Table 21.

Table 21. T-test independent sample unequal variances

T-test independent sample unequal variances	Control Group	Treatment Group
Mean	36.63	65.43
Variance	977.12	577.40
Observation	415	426
P(T<=t) one-tail	0.000	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.000	
t Critical two-tail	1.96	

Source: Author's calculation (2021)

The difference variance between the control and treatment groups requires a t-test independent sample with unequal variance. The results in Table 21 found that the difference between the two groups is statistically significant. The p-value one tail score is statistically significant, which means that one group has a higher score than another group. The treatment group reached a higher score than the control group. Based on the results from Table 20 and 21, this research found that the difference between the pre-test and post-test of treament groups and between post-test treatment and post-test control groups are all statistically significant. It means that the the first class of customized financial education material which is financial planning has higher impact than the conventional financial education which discusses risk management.

Additional analyses were executed to identify the subjective measurement of financial planning. Perception of the importance of financial planning and intention to make financial planning are the main aim of this subjective assessment. Students were asked right after the class ended. Using 5 Likert scales, the students were asked about their perception about: 1) financial planning is beneficial for my future, 2) financial review is essential for my life, 3) I will make a financial review soon, 4) I will make financial planning soon. Table 22 shows the summary of the results.

Table 22. Subjective assessment on financial planning

Questions	Yes, absolutely	Might be yes	I am not sure	I do not think it will useful	Not useful at all
1. Financial planning is beneficial for my future	76.53%	22.07%	1.17%	0.23%	0.00%
2. A financial review is essential for my life	73.71%	18.54%	7.75%	0.00%	0.00%
3. I will make a financial review soon	60.33%	24.88%	14.55%	0.23%	0.00%
4. I will make financial planning soon	47.89%	36.62%	15.26%	0.23%	0.00%

Source: Author's calculation (2021)

Based on Table 22, we can see that participants perceived financial review and financial planning are essential for their lives. More than 73% of students chose both tools as crucial for their future. However, when students were asked about their intention to create a financial review, only 60,33% of them were sure to make a financial review and only 47,89% was certain to create financial planning. Even the intention of making both tools are different, but participants' willingness to make a financial review and financial planning (total percentage that chose yes absolutely and might be yes) is still more than 80%.

4.4.2. The impact of expense management and saving course on saving behaviour

The second class of customized financial education is expense management and saving. In this part, the outcome measurement was assessed using both objective and subjective measurements. The objective measurement uses the amount of saving account participants had before class and four months after the class finished. In the subjective measurement, participants were asked about their perception on four questions related to the topic. Participants were required to fill in the amount of their saving balance in Indonesian Rupiah. Statistic descriptive were used to understand the basic information about the results. Here Table 23 presents the summary of descriptive statistics and paired sample t-test of the checking account on the participants.

Table 23. Summary of the results on saving and expense management

Statistics Descriptive	Pre-test treatment group	Post-test treatment group	Pre-test control group	Post-test control group
Mean	3.667.139,41	4.369.058,97	2.079.233	2.024.918
Mean difference		701.919,56		54.315
Standard Deviation	16.257.489	17.392.389	6.027.955	6.329.423
N	376	376	358	358
Variance	264.305.953.137.245	302.495.212.273.067	36.336.242.700.721	40.061.605.488.083
t-test paired sample p-value one tail		0.000		0.313
t-test paired sample p-value two-tail		0.000		0.626

Source: Author's calculation (2021)

The mean difference can be seen for each group in Table 23. It shows that the average increase of checking account in the treatment group is 701.919, and the average increase of checking account of the participants in the control group is 54.315. The difference test found that the treatment group is statistically significant, while the control group found to be statistically not significant.

To give a more robust test, the t-test independent sample has been done to compare the post-test treatment group and post-test control group. This analysis aims to find out the difference between the treatment group and control group. The results of T-test independent sample can be seen in Table 24.

Table 24. T-test independent sample between saving and control group

T-test independent sample	Post-test treatment group	Post-test control group
Mean	4.369.058	2.024.918
Variance	302495212273067	40061605488083
Observation	376	358
P(t<=t) one-tail	0.007	
P(t<=t) two-tail	0.014	

Source: Author's calculation (2021)

T-test independent sample was run to determine the difference saving balance of checking account between the post-test treatment group and the post-test control group. Table 24 shows that the treatment group has a higher checking account than the control group, which is statistically significant. Based on that result, this research found that student checking account is higher after participating in the customized financial education than conventional financial education is proven by the data of this research.

Additional analysis has been done on this topic: students assessed their perception of the importance and intention of having a saving account, applying frugal living, starting their emergency funds, and wise spending. The assessment was done just in time after the class finished. Using 5 Likert scales, a total of 376 students in the treatment group and 360 students in the control group, here Table 25 summarises the result of subjective measurement. To make it easier to understand, Figure 5 and Figure 6 were used to show the difference between the control and treatment groups. Figure 5 shows participant choices in the treatment group, mostly they choose strongly agree and agree, while in the control group, the participant choice spread on five choices. The results show that participants in the treatment group perceived the concept of frugal living, have emergency funds, wise spending and have enough saving account as critically important compared to the control group. From Figure 5, the emergency funds topic is perceived as the most important for students, they are also willing to start establishing emergency funds. However, the wise spending behaviour looks the least interesting for students as they choose not to be inclined to one side.

Table 25. Subjective measurement of Saving and Expense Management

		Strongly disagree		Disagree		Undecided		Agree		Strongly Agree	
		Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment
Student perception on saving and expense management	**Saving balance account is important**	0%	0%	14%	8%	15%	0%	29%	29%	42%	63%
	Applied frugal living is important	14%	0%	20%	0%	29%	6%	31%	49%	7%	45%
	Having emergency funds is important	13%	0%	16%	0%	24%	0%	47%	8%	0%	92%
	Spending on essential goods is important	0%	0%	16%	0%	25%	0%	36%	30%	24%	70%
Student intention on saving and expense management	**I will save more money in the future**	18%	0%	11%	0%	29%	1%	27%	13%	16%	86%
	I will apply frugal living	13%	0%	27%	0%	43%	2%	16%	40%	0%	58%
	I will start collecting money into emergency funds	5%	0%	12%	0%	49%	0%	34%	9%	0%	91%
	I will differentiate consumptive spending and productive spending	0%	0%	5%	5%	49%	13%	41%	33%	5%	49%

Source: Author's calculation (2021)

4.4.3. The impact of investment course to student knowledge on investment

The third topic of customized financial education is about investment. Objective measurements were used to measure participant investment knowledge. The students were asked to answer ten questions to assess their investment knowledge. Students got a score based on their correct answer; each correct answer was worth 10 points, then a total of 100 points could be collected in this stage.

The total number of participants in this session is 412 for the treatment group and 406 for the control group. This research compares the pre-post-test treatment groups' results and compares the post-test treatment group and post-test control group to understand the impact of customized financial education compared to conventional financial education. Table 26 shows the summary of descriptive statistics and result of paired sample t-test for treatment and control group.

Table 26. Summary of the result on investment class and control class

Statistics Descriptive	Pre-test treatment group	Post-test treatment group	Pre-test control group	Post-test control group
Mean	47,07	60,25	48,38	48,80
Mean Difference		13.1725		0.4197
Standard Deviation	15,06	16,56	13,84	15,19
N	412	412	406	406
Variance	226,67	274,25	191,55	230,67
t-test paired sample p-value one tail		0.000		0.322
t-test paired sample p-value two-tail		0.000		0.645

Source: Author's calculation (2021)

Based on Table 26, the mean difference of the treatment group is higher than the control groups. The treatment group's score increased from pre-test (47,075) to post-test (60,247). Compared to the control group, the mean increased from pre-test (48,382) to post-test (48,801). An increased value was found between pre-test and post-test for both groups. A t-test paired sample was examined to determine the difference between pre-test and post-test on each session. The result of the t-test paired sample is that the treatment group had a statistically significant score and the control group found to be not statistically significant. To show the robustness of the test, a comparison between the post-test treatment group and the post-test control group has been made. T-test independent sample has been done to find out that comparison. Table 27 shows the t-test independent sample results to compare the post-test treatment group and post-test control group.

Table 27. T-test independent sample between investment and control group

T-test independent sample	Post-test treatment group	Post-test control group
Mean	60,24	48,80
Variance	274,25	230,67
Observation	412	406
P(t<=t) one-tail	0,000	
P(t<=t) two-tail	0,000	

Source: Author's calculation (2021)

The result of t-test independent sample on the post-test between treatment and control group was found statistically significant, which means the two-group were found have a different score. The mean score in table 27 shows that the treatment group (60,247) has a higher score than the control group (48,801).

Based on table 26 and 27, it shows that the customized financial education which is investment topic found have more impact to the student compare to the conventional financial education.

4.4.4. The impact of debt management course to student debt knowledge

The last topic to evaluate the impact of customized financial education is the debt management course. Ten objective measurements were applied to measure students' knowledge about personal debt. Each student should answer all ten questions correctly to get the highest score of 100 points.

In this session, 385 students participated in the treatment group and 368 valid students from the control group. To examine the impact, a t-test paired sample and t-test independent was used. Table 28 summarizes the results of the t-test.

Table 28. Summary result of debt class and control class

Statistics Descriptive	Pre-test treatment Group	Post-test treatment Group	Pre-test control group	Post-test control group
Mean	66,52	73,82	57,67	59,84
Mean Difference		7,30		2,17
Standard Deviation	21,01	20,15	20,06	18,31
N	385	385	368	368
Variance	441,50	405,96	402,19	335,15
t-test paired sample p-value one tail		0,000		0,053
t-test paired sample p-value two-tail		0,000		0.105
t-test independent sample (p-value one tail)				0,000

Source: Author's calculation (2021)

Table 28 shows that the increasing mean between pre-test and post-test is higher on the treatment group (7,2987) compared to the control group (2,1742). The second requirement is the paired sample t-test on the treatment group in this research found statistically significant. The last requirement is that the independent sample t-test on the post-test treatment group should be higher and statistically significant compared to the post-test control group. The independent sample t-test shows that the difference between the two groups is found to be statistically significant. The mean of the post-test treatment group is higher (73,8181) than the post-test control group (59,8402) then all the requirements are accepted. The result shows that students who join customized financial education have statistically higher score in debt knowledge compared to student who join conventional financial education.

5. CONCLUSIONS, LIMITATIONS, AND IMPLICATIONS

5.1. Conclusions

This research aimed to identify the way to increase the effectiveness of financial education. To examine how to increase the effectiveness of financial education, this research focused in developing materials of financial education. Three research questions were addressed to reach the aim of this research. The first question is what is the most critical topic for university students to learn about financial education? The second question is what are the important factors in developing financial education material? The last question is, does this customized financial education material have more impact than the conventional financial education material?

1. As a result of this research the five most important topics were identified for university students to learn personal finance: financial planning, saving, cost management, investment, and debt. This finding is similar to a previous research having examined university students' desire to learn personal finance in Malaysia. They found that budgeting, saving, investment, spending, credit management, and increasing income are the first five topics students desired to learn (JARIAH et al., 2004).
2. The second question in this research dealt with the essential factors in developing financial education materials. Based on the literature review, it was found that there were three critical factors to develop financial education materials: 1) tailored for certain participants, 2) motivate the participants to change their behaviour and 3) teach them a bias in financial decisions.
3. The last question in this research has been answered by comparing conventional financial education and customised financial education that developed in this research. Conventional financial education teaches about risk, interest, inflation, future value, present value, and bank service. The customised financial education teaches financial planning, expense management, saving, investment, and debt. The results found that the customised financial education has more impact than conventional financial education. This research developed the financial education materials using previous research suggestions and self-determination theory. The impact of customising financial education has been measured using objective and subjective measurement and tested on university students.

Previous research in financial planning focusing the planning on retirement in several countries such as the US (LUSARDI and MITCHELL, 2011), Japan (SEKITA, 2011), Italy (FORNERO and MONTICONE, 2011), Canada (BOISCLAIR et al., 2015), Germany (BUCHER-KOENEN and LUSARDI, 2011), the Netherlands (BOISCLAIR et al., 2015), and Chile (MOURE, 2016). They examined the relationship between basic financial literacy using three big questions with participant intention, behaviour, and attitude towards retirement planning. To the best of the author's knowledge, research in financial planning mainly focuses on retirement planning behaviour. This research contributes to the literature on developing financial planning materials for university students. The material is different from retirement planning as we teach participants to understand their potential assets and how to monetise their potential to become their future source of income, which is different from retirement planning education.

Previous research is also related to retirement planning with saving behaviour (BROWN and PREVITERO, 2014; MOORE and MITCHELL, 2000; OEHLER and WERNER, 2008). The belief is that people with good saving behaviour positively impacts the accumulation of the asset during their retirement period (SUI et al., 2021). On the other hand, many previous researchers examine the determinant of saving behaviour such as financial literacy level (ARIFFIN et al., 2017; JONUBI and ABAD, 2013; MURENDO and MUTSONZIWA, 2017; PURSTY, 2011), sociodemographic characteristics of people (AMARI et al., 2020), previous access to financial education (DOUGLAS et al., 2003). While it still lacks literature that develops their own financial education and test their financial education material to examine the impact of that material.

Research in saving education has been examined using an experimental method previously by comparing the existing financial education curriculum developed by Alfatoun and Honest money box that followed by padlock saving box by the school (BERRY et al., 2015) and goal-setting that followed after the course (COLE et al., 2017). They both found that the additional program after financial education could increase the probability of participants to change their behaviour. While financial education itself already costly to implement by the policymakers, if they put additional program to increase the impact to participant behaviour, it would cost more for the organisation. This research contributes by developing materials in financial education to increase their impact on the participants. Then we do not need to spend money on another additional programs. This contribution is more cost-effective for the organisation.

However, previous research found that financial education seminar only works best with poor people with low education (LUSARDI, 2007), this research found the opposite. A university student who has a high educational level and does not fall into a poor society has a beneficial impact from saving education. They could increase the saving amount four months after the class finished.

After finishing the investment course, they understand some basic knowledge of investment such as the principal of investment, risk preference in investment, where to search information before investing the money, fake investment, understand active and passive income, understand financial and rill investment, etc. This topic would be interesting if we could measure actual investment behaviour. Unfortunately, students rarely make their investment, as very few of them have an active income. Some students already become an investor, because their parents gave financial support for them to start investing in stocks, mutual funds, and bonds. But it was less than 1% of the total participants in this research.

The previous research that focused on investment financial education, they teach financial education for high school students (BECCHETTI et al., 2013). They examined student perception of investment choice between saving money in cash or putting the money in the investment instrument, such as government bonds, private bonds, and stocks (BECCHETTI et al., 2013). The result is remarkable, as students shifted their intention to put the money in the investment instrument. However, this choice is still having a risk of students' answer with social desirability bias. That risk is in line with other previous research findings that participants who filled in self-assessed financial literacy found a higher score than their objective financial literacy (BRUGIAVINI et al., 2015). This finding implies that objective financial assessment from financial education is important for research to reduce the possibilities of bias in their answer.

The fourth class is about debt management. After finishing this class, students understood the nature of the debt, the risk, and opportunities of debt, how to avoid debt in vehicle and housing, shariah debt value, frugal living as a way of life, productive debt, and consumptive debt.

5.2. Relation of the research results with previous literature

Previous research recommends just in time training as one of the effective way to deliver financial education (FERNANDES et al., 2014; HASTINGS et al., 2013). Just in time training is the training that delivers material at the right time to the right people, it found could increase the effectiveness financial education because participants could apply the knowledge immediately after learning (FERNANDES et al., 2014; THOMPSON et al., 2000). This research defines just in time training by developing material that tailored for certain participants and gave examples that are easy to replicate. Both factors are important in developing financial education material to increase the probability of student to change their behaviour.

The financial education that delivers material on saving and management expenses found that participants increased their saving account four months after the class ended. This finding is similar to previous research that examined the impact of saving education in migrant workers in Indonesia, they also found that the impact is significant (DOI et al., 2014). There are some similarities with this study. This study delivers material that is easy to apply, up-to-date, practical, discusses about financial decisions and teaches participants the advantage of certain behaviour. They also customised the material that fits with immigrants, which is discussed a lot about remittance and financial exchange rate. So, delivering one-fit-for-all financial knowledge such as interest, loan calculation, inflation, risk diversification concept is far away from what people need in their daily financial decisions.

Another previous research that examined the impact of customised financial education also found a significant impact on participants financial proficiency in high school (BRUHN et al., 2016). They are using RCT and item response theory to examine the impact of financial education. They found that the saving and budgeting behaviour increases for the treatment group and not for the control group. An interesting finding is that students and teachers like the study cases which provide financial education, as it is practical and close to their daily lives (BRUHN et al., 2016). This approach is similar to our research that develops material fit for the participants' daily life. It makes them easy to replicate and easy to execute.

Research that successfully improved the impact of financial education found that personal counselling and short-term goal-setting play a significant role (COLE et al., 2017). They found that personalised counselling and goal setting are critically important to boost the impact of financial education, as it could improve the impact to 26,5% more than the control group (COLE et al., 2017). Personalised counselling on that research means that people are given consultation based on their needs and are given financial advice based on their problems. This research re-confirms that statement because this research using material that develops specifically for university students. The material developed based on real financial problem and asked student what they expect in the financial education. Based on that data, the material develops several study cases inside the material to give student a real story of personal finance problem. Give student financial education that teach them with real story of financial problem is more cost-effective compared to one-on-one personal counselling. Even though the material development cannot fulfil the needs of each student, the material is mostly fit with student needs and expectations. This material is practical-based and deliver examples that are easy to execute for the student. All of them are customised for university students, the fitness of material with the audience is the strong point in this research.

Similar research that examined the impact of financial education was held in Indonesia. They examined the impact of one semester of personal finance education at university on students' financial capabilities (knowledge, attitude, and behaviour). The result found that the class improved financial knowledge but not attitude and behaviour on finance (JOHAN et al., 2020). This research has similar measurements, we also measured the impact on student knowledge and behaviour. The main difference is that in our research objective behavioural measurement was applied while the previous research used only perceived behaviour measurement. The perceived financial behaviour assessment faces a high risk of social desirability bias that participants could answer based on the researcher's expectation.

The previous research found that personal counselling and goal setting could improve participants' knowledge and attitude towards their financial condition. However, the long-term effect on saving, budgeting, and borrowing has still not been examined (CARPENA et al., 2019). They suggest inducing motivation and more personal delivery as a key to improving the long-term effect of financial education. This research addresses that suggestion by delivering material that includes motivation to change the behaviour and custom the material that fit only for university students. The saving and financial planning behaviour was examined only four months ahead. Even the result for the four months later improved significantly, but the effect is still unexplored for longer time.

This research finding re-confirms previous research that identifies financial attitude has a vital role in financial behaviour. They found that people who understand the advantage of saving money will be saving their money (CARPENA and ZIA, 2020). This research also found that the impact of financial education is better when we not only deliver information but also give them motivation. This conclusion is consistent with previous research that suggests perception in financial product play an important role in financial education (CARPENA and ZIA, 2020). Previous research also suggests that non-cognitive is vital in financial education to lead rational financial decision-making (ALSEMGEEST, 2015).

Some previous research was trying to increase the effectiveness of financial education using additional programs or tools such as: one-on-one counselling, pay-per-performance, goal-setting (CARPENA et al., 2015) and honest money box programs (BERRY et al., 2015). In comparison, they are forgot to evaluate and develop financial education itself. This research contributes to the literature on the development of financial education material. This research found several critical factors in developing financial education material to increase their effectiveness.

One of the theories that have been used in this research is the self-determination theory. This theory explains how people are motivated to change their behaviour by external and internal factors. One of the external factors that could motivate people to change their behaviour is understanding the fear of loss and the desire to achieve rewards. This factor has been used in this research to induce motivation for the students to customise financial education. This research gives the story of bad financial decisions and good financial decisions to deliver that sense of fear in bad financial decisions and a sense of achievement when making a good financial decision. Bad stories such as over debt, consumptive debt, overspending, fake investment, etc. have been used to warn participants about bad financial decisions. On the other hand, good stories such as financial planning, return of investment, the benefit of frugal living, etc., motivate participants to change their behaviour to get certain rewards.

5.3. Limitations and future studies

This research delivers financial education using an **online platform**. Online meetings and online conference applications have been used to teach the students in treatment and control groups. This has been done due to a worldwide pandemic. This data collection was limited by the researcher's ability to interact and discuss directly with the students. If this research data collection doing by direct class meeting, some interesting in the field might be found during the research. For example, researcher might could identify which part of the material most interests to the student, and which does not get the students' attention. Future studies should be done to keep improving the material and curriculum of financial education. Direct meetings and interaction could be a future study to find out and evaluate current materials into a better one. The long impact of financial education in this research only examines the saving behaviour as it was examined four months after the education ended. Unfortunately, we could not examine the effect of financial planning, investment, and debt classes after a longer period.

This research is also limited by developing the materials specifically for **university students** in Indonesia, which is suitable for 17-21 years old, but they might be still relevant to people aged 30 years old in Indonesia. However, this material of financial education might not fit with poor societal and retired people. They need different examples, cases and stories to tell to motivate them to change their behaviour. They also have a different problem than middle-class society in Indonesia. Further studies could be executed with a similar approach but develop specified for poor societies to reduce their poverty.

5.4. Implications

The effectiveness of financial education is a complex phenomenon, as **it needs to be developed by locals** as they understand the cultural value of the targeted participants. As no one-size-fits-for-all financial education material could effectively improve participants' behaviour, each country needs to develop their financial education material and curriculum based on their values. This research found that several factors are essential for the financial educator to develop their current curriculum. They must be aware that the material should be customised based on the participants' needs, induce motivation to change behaviour and teach them common financial decision bias could increase their effectiveness.

Based on this research's conclusion, financial educators and policymakers should consider **evaluating and developing current financial education to increase its effectiveness.** To change people's behaviour, they need more than information. For example, people know that saving is essential, but why do many people have no savings account? They need an explanation of the risk of having no saving account, they also need to understand the benefit of having a saving account. They need motivation and reasoning to understand that issue. Motivation and reasoning will make the financial education material easier to remember than a conventional education that delivers only information to the students. Teaching using practical cases, problem-solving, and the authentic story could help students to imagine what will happen to them soon if they make a terrible and if they make a good financial decision right now. Giving the students an easy example to replicate also helps them shift their new knowledge into actual behaviour. All these factors are essential to increase the beneficial impact of financial education to the participants.

Each profession might need a different approach and example in the material of financial education. For example, a government employee with fixed, regular income and a pension in their retirement age needs a different example and story compared with a seasonal farmer or sailor who has a huge income in a certain period and loses their income in a low season/holiday period. If we need to teach them finances, we cannot use these materials which were developed specifically for university students, we should ask them, discuss with them, and develop together with them to make us feel how their finances are, what is their main problem financially. Then we could develop materials that could motivate them to change, materials that fit with their life.

6. NOVEL FINDINGS OF THIS RESEARCH

Here is a summary of the novelties of this research. This research provides three novelties to the financial education and financial literacy literature.

1. First, this research developed a framework that can be used by anyone to develop financial education materials. The framework was discovered by synthetising previous literature review in financial education, using behavioural theory framework, assess existing financial education curricula and learning style. This research found three critical factors to develop more impactful materials in financial education:
   1. tailoring for certain participants,
   2. delivering motivation to change the participants' current behaviour and
   3. teaching participants bias in financial decision.
2. Second, this research developed customized financial education materials using these three critical factors. The process of development in the material of financial education is part of the novelty of this research, because this is among the first research that developed their own financial education materials. To develop the materials, first this research set specific target participants who were university students in this research. To make it tailored for university students, this research collected data from several points of view (students, adults, and financial advisors). To induce motivation to change behaviour, this research synthetized several behavioural changing theories to understand how people change and using first data collection to develop material that could induce motivation. The process of understanding bias in financial decision comes from several resources: 1) behavioural research paper and 2) common belief that locally exists in Indonesia. Then the easiest solution of those bias was found to be taught to the participants. This process produces financial education materials which are customized and fitted specifically for university students in Indonesia.
3. Third, this research is among the first research in financial education without additional program that could increase participants' balance in their checking account. This research was focusing in developing material that could give more impact to the participants. In the expense management and saving course this research gives student the cost-benefit of having emergency funds, rich mind-set in expense management, differentiate between productive and consumptive spending, benefit of frugal living, real cases of people without emergency funds, real cases of people who overspending,

etc. That material could trigger participants' willingness to reduce their spending and start to save more money in their checking account.

7. SUMMARY

From 2016 to 2019, Indonesia's financial literacy index grew. According to a nationwide poll on Indonesian financial literacy, Indonesians had a financial literacy index of 29,6 percent in 2016, which has increased to 38,03 percent by 2019 (OTORITAS JASA KEUANGAN, 2019). With a population of 269,6 million people, only about 102 million individuals in Indonesia are literate. In Indonesia, this means that only three individuals out of ten are literate. As a result, boosting financial literacy has become one of Indonesia's national strategic challenges.

Previous research found that financial literacy level has a relation with the quality of financial decisions. Low financial literacy could trigger bad financial decisions and vice versa. Family, friends, and environment could influence financial literacy levels. However, it is not easy to control all those factors. So financial education could help us to solve that problem. Financial education as a tool to solve the lack of financial literacy itself has a problem. The effectiveness of financial education has been an issue that should be solved.

Effective financial education is a critical problem worldwide and even more critical in developing countries (FRĄCZEK et al., 2017). This research aimed to find an effective way to deliver financial education for university students in Indonesia. University students were chosen because they were in the last gate of formal education before officially becoming independent from their guardian.

Previous research found mixed results in the impact of financial education. Some of them found positive and significant impact, while the others found the opposite. Some previous research was also trying to add another program that followed financial education to increase the impact, but they forgot to improve their financial education. This research aims to identify how to increase the impact of financial education. To reach this aim, this research is divided into three stages.

The first stage aimed to identify the essential topics of financial education for a university student in Indonesia. To answer this question, mixed-method data collection was applied from three points of view to make it more comprehensive. We collected from an adult point of view, university student expectations, and financial advisors. Five main topics were identified to be critical for university students in Indonesia: financial planning, expense management, saving, debt, and investment.

The second stage of this research was to identify an essential factor in improving financial education's effectiveness. This research focused on developing financial education material. To identify an important factor in developing financial education material, literature review of previous studies was done focusing on evaluating the effectiveness of financial education. There were three critical factors to develop financial education materials. If we followed these three steps to develop financial education material, we could increase the impact of financial education. The three essential points in developing financial education materials are:

1. The material should be tailored for specific participants. We should choose proper materials for specific audience, and we should use an example that is close to their life to make them easier to relate.
2. The material should motivate participants to change their behaviour. In this part we use a lot of bad and good stories of bad financial decisions and good financial decisions. We also induce them the urgency of changing their behaviour. To increase their motivation to change their behaviour, we should give an example that is easy for them to imitate.
3. The material should teach bias financial education. As the last part, after students understand which is a good financial decision and which is a bad financial decision. We should teach them a common bias in financial decision. We also teach them some common misconceptions about money and teach them some marketing tricks that make people to be impulse buyers.

After the most critical factors were found to develop financial education materials, this research developed customised financial education as the third stage. The material is customised for university students in Indonesia. The customised financial education separated into four courses. Each meeting discusses specific financial topics: 1) financial planning, 2) expense management and saving, 3) investment, and 4) debt. Each meeting was two hours of lectures and discussions.

To examine the customized financial education, this research tested the materials for university students in Indonesia as the last stage. 862 students participated in the four-week online course. At each meeting students discussed and learned financial education for 120 minutes. This research found that students who joined the customized financial education course that we developed had better financial planning and saving behaviour. They also found that they have higher investment and debt knowledge than the students who were in the control group who got conventional financial education.

The effectiveness of financial education is a complex phenomenon, as it needs to be developed by locals as they understand the cultural value of the participants. As no one-size-fits-all financial education material could effectively improve participant behaviour, each country needs to develop its financial education material and curriculum based on its value. This research found that several factors are essential for the financial educator to develop their current curriculum. They must be aware that the material should be customized based on the participants' needs, induce motivation to change behaviour, and teach them common financial decision bias could increase their effectiveness.

Based on this research's conclusion, financial educators and policymakers should consider evaluating and developing current financial education to increase its effectiveness. To change people's behaviour, they need more than information. For example, people know that saving is essential, but why do many people have no savings account? They need an explanation of the risk of have not saved an account, they also need to understand the benefit of having a saving account. They need motivation and reasoning to understand that issue. Motivation and reasoning will make the material stick to students' memory longer than a conventional education that delivers only information to the students. Teaching practical cases, problem-solving, and honest stories could help students imagine what will happen to them soon if they make a bad and good financial decision. Giving students an easy example to replicate also helps them to shift their new knowledge into actual behaviour. All these factors are essential to increase the beneficial impact of financial education to the participants.

Each profession might need a different approach and example in the material of financial education. For example, a government employee with fixed, regular income and a pension in their retirement age needs a different example and story with a seasonal farmer or sailor who has huge income in a certain period and loses their income in a low season/holiday period. If we need to teach them financial education, we cannot use one-size for all financial education, we should ask them, discuss with them, and develop together with them to make us feel how was their finances live, what is their main problem financially. Then we could develop material that could motivate them to change, materials fitting with their life.

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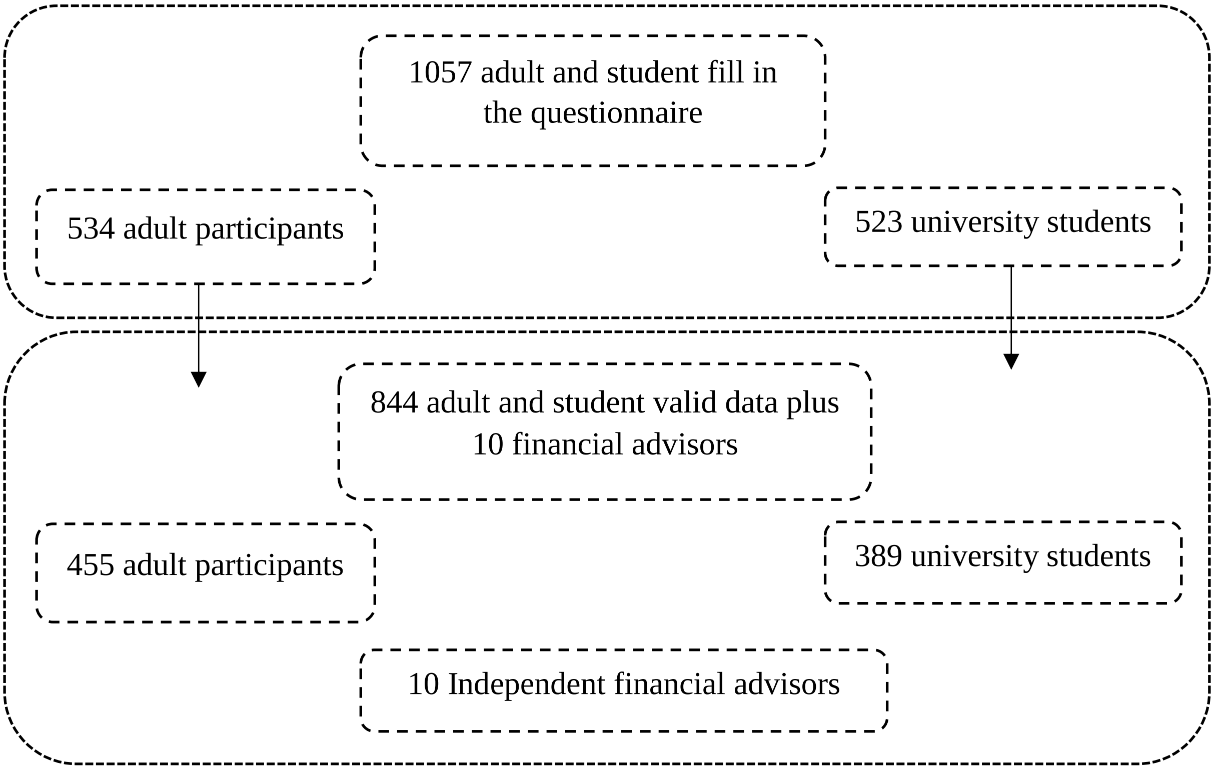
APPENDIX

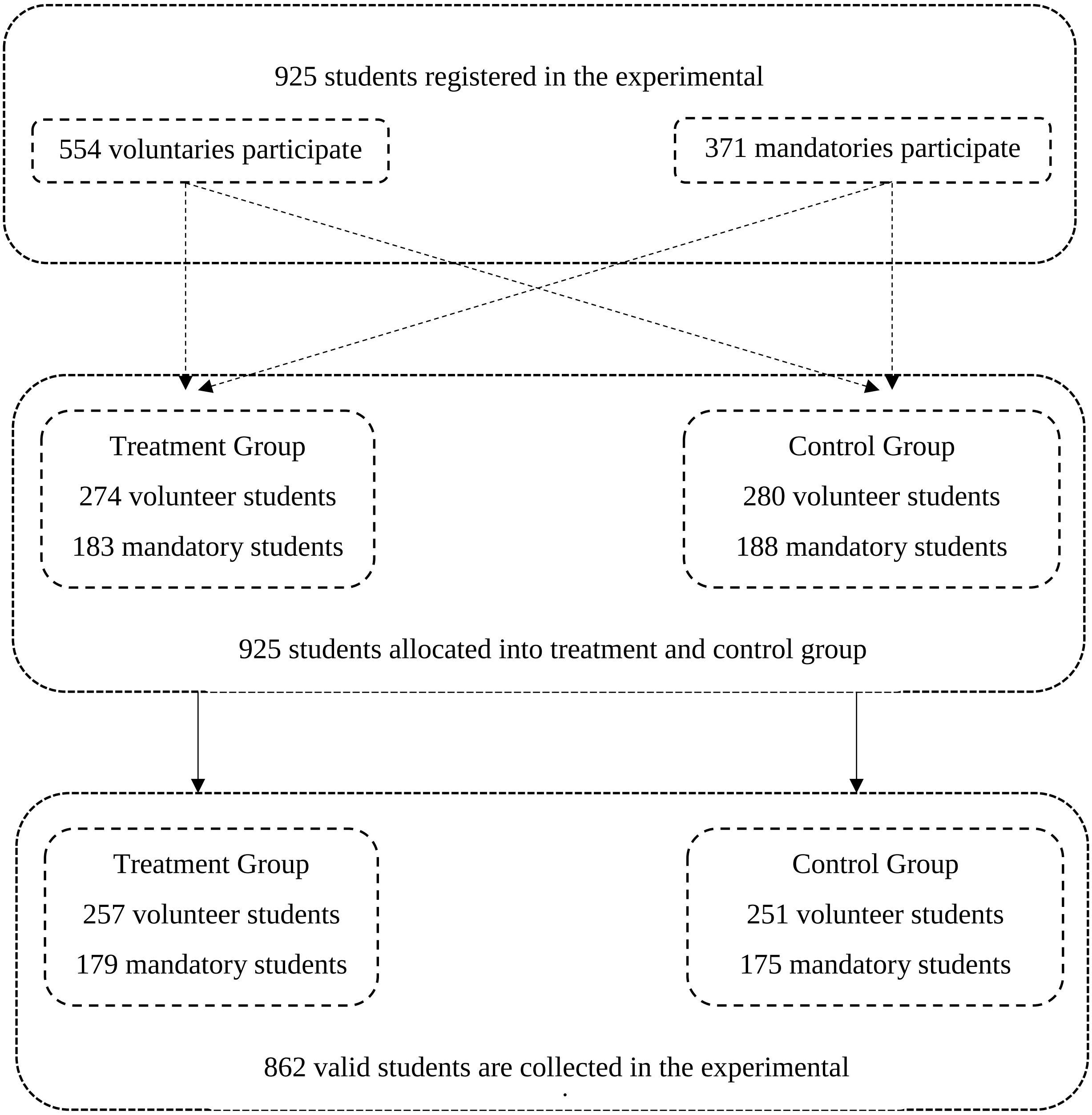
Appendix 1

FIRST DATA COLLECTION PARTICIPANTS



Appendix 2

EXPERIMENTAL DATA COLLECTION PARTICIPANTS



Appendix 3

QUESTIONNAIRE

1. Financial planning behaviour
   - Objective measurement Pre-test and post-test: (100 point):
     A financial review consists of the personal balance sheet (25 points) and personal income statement (25 points). Financial planning consists of a forecast annual income statement (25 points) and an action plan to obtain the income (25 points).
   - Subjective measurement (JIT Measurement, 5 Likert scale)
     a. Financial planning is important for my future
     b. Financial review is important for my life
     c. I will make financial review soon
     d. I will make financial planning soon
2. Expense management and saving behaviour
   - Objective measurement Pre-test and post-test 4 months after the course (monetary unit, Indonesian Rupiah):
     a. How much the checking account that you have right now?
   - Subjective measurement (Perception and intention, 5 Likert scale)
     a. Perception questions:
        a. Saving balance account is important
        b. Applied frugal living is important
        c. Have an emergency funds are important
        d. Spending in essential goods is important
     b. Intention questions:
        a. I will save more money in the future
        b. I will be applied frugal living
        c. I will start collecting money into emergency funds
        d. I will differentiate between consumptive spending and productive spending
3. Investment Knowledge (objective measurement)
   a. What is the benefit of investment?
      a) Have another source of income
      b) First stage of financial freedom
      c) Preparing potential cashflow in the future
      d) All choice above is true
   b. What is the risk of people without investment?
      a) Easy to fall into poverty if lose their job
      b) Risk of Bankruptcy because they depend on one source of income

c) Must work continuously to cover their daily expenses

d) All the choice above is true

c. Which one of these are not the risk preferences?

a) Risk Averse

b) Risk Taker

c) Risk Average

d) All the choice above is true

d. Which one is the hedging instrument?

a) Deposit

b) Gold

c) Saving account

d) Mutual funds

e) All the choice above is true

e. Which is the principal of investment?

a) Check the financial statement

b) Calculation over the intuition

c) Check the business legality

d) All the choice above is true

f. How much in average annual return of deposit and bonds?

a) 20%

b) 10%

c) 7%

d) 50%

g. How much in average annual return of property investment?

a) 10-20 %

b) 5 – 10 %

c) 30 – 40 %

d) 50 – 60 %

h. What are the characteristics of fraud investment?

a) Above average return

b) The scheme like money game

c) The Business model unclear

d) All the choice above is true

i. How much in average annual return of agriculture investment?

a) 5 – 10%

b) 7 – 20%

c) 10 – 30%

d) 30 – 100%

j. How much in average annual return of the livestock investment?

a) 20%

b) 15%

c) 50%

d) 80%

4. Debt management knowledge (objective measurement)
    a. What is the risk of debt?
        a) Deadline each month to pay the bills
        b) Have a monthly bill that should get paid
        c) The source of income should not stop to pay the bills
        d) All the choice above is true
    b. Rico is a content creator, currently his business has started to grow, and his assets are starting to increase slowly. He processes all the content created using the computer that he uses to write the thesis. Computer with standard graphics card and small RAM. The process of editing content that he creates requires a computer with a larger RAM capacity and better graphics card quality. But at the same time, he also wants to upgrade his cell phone because currently the latest iPhone 11 is release and he is curious about the features of this cell phone. Which is the most rational choice below for that condition?
        e. Buy brand new iPhone 11
        f. Buy brand new desktop PC
        g. Upgrade RAM and Graphics Card for the old desktop
        h. All the choice above is true
    c. In the case of Rico above, if Rico has to make a credit transaction, which one is consumptive credit decision?
        a) Buy brand new iPhone 11
        b) Buy brand new desktop PC
        c) Upgrade RAM and Graphics Card for the old desktop
        d) All the choice above is true
    d. What should be considered the important things before deciding to buy a house?
        a) Location
        b) Neighbourhood
        c) Financial condition

d) All the choice above is true

e. What should be considered before deciding to buy a car?

a) Functions above the brands

b) Calculate the Sticky cost

c) Financial condition

d) All the choice above is true

f. What must be considered to avoid debt?

a) Applied Frugal Living

b) Identify the essential and non-essential spending

c) Understand personal financial condition

d) All the choice above is true

g. What is the difference between Islamic and conventional debt?

a) Islamic debt without interest, conventional debt with interest

b) Islamic debt without penalty fee, conventional debt with penalty fee

c) Islamic debt is not a business transaction, conventional debt is a business transaction

d) All the choice above is true

h. What does it mean by frugal living?

a) Makes end meet

b) Living below the ability to earn

c) Living above the ability to earn

d) All the choice above is true

i. The benefit of living debt free?

a) We can work independently

b) Have a free time

c) Life calmer and more creative

d) All the choice above is true

j. What is the sticky cost of buying car with credit transactions?

a) Cost of fuel

b) Maintenance cost

c) Insurance and toll fee

d) All the choice above is true

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