THESIS OF THE DOCTORAL (Ph.D.) DISSERTATION

THE IMPACT OF CUSTOMIZING FINANCIAL EDUCATION ON UNIVERSITY STUDENTS' FINANCIAL KNOWLEDGE AND FINANCIAL BEHAVIOUR

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1. INTRODUCTION OF THE TOPIC AND OBJECTIVES

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.

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).

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.

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.

Main objectives

This research aims to develop and test a customized financial education material. 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.

2. MATERIAL AND METHODS

2.1. First stage

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 the circle of independent financial advisors to confirm the adult financial problems which 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 was spread through online and paper questionnaires. The online questionnaire was shared via 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 needed 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 the first stage of this research, but only 844 were valid for the analysis as they filled all the questionnaires. There were 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. 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.

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 problems. As financial advisors, they face many financial problems coming from their clients. The aim of involving independent financial advisors was 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 answers 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.

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. 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. 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 1 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.

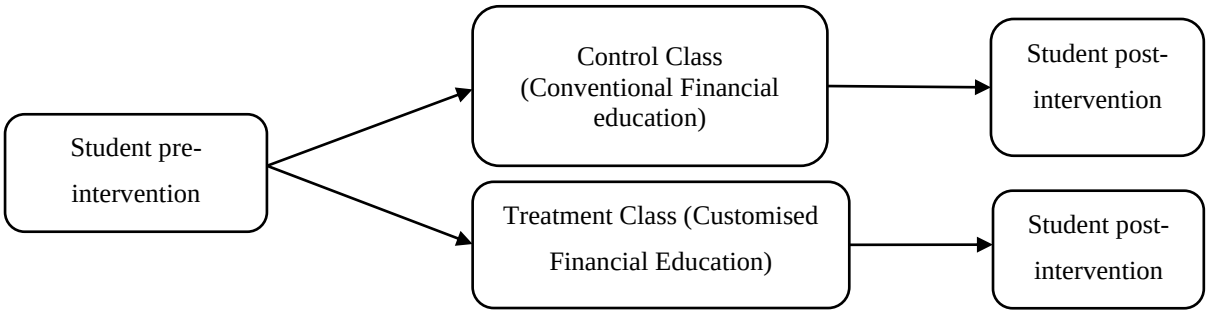

Figure 1. Experimental design

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 1 contains the list of the manipulation check that was part of the measurement instrument of the research.

Table 1. 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)

Table 2 shows the summary on each stages. Each stage has different aim and data collections. Extensive and different methodology is mandatory as it is the most suitable method to reach the aim of each stage.

Table 2. Summary of research stages

Stage of research	Aim	Method
First stage	Identify the most critical topic 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 material	Literature review and secondary data
Fourth stage	Examine the customized financial education	Experimental

Source: Author's own compilation (2020)

3.2.2. Outcome measurement

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 nominal values between 0-100. Financial planning has two stages measurement: the first stage is when students do a financial

review, which consists of a personal balance sheet and annual income statement. The second is when the students do financial planning, which consists of the forecast of annual income in the next two years and a quarterly action plan on obtaining the income. They will get the score based on Table 3.

Table 3. Financial planning measurement

No	Student financial planning Measurement	Score
1	The student creates a financial review	
	a) Students make a personal balance sheet	25
	b) Students make personal income statement	25
2	Students create a personal financial plan	
	a) Forecast of the annual income statement	25
	b) Reasonable quarterly action plan on how to obtain the income	25

Source: Author's design (2020)

If the students have completed four parts of financial planning, then they receive 100 points on financial planning score. To answer the hypotheses, 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. To reduce the effect of time in the outcome measurement, 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. There are four questions that participants should answer just in time after the class ended: 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. Each question has been answered using 5 Likert scale (Yes absolutely, might be yes, I am not sure, I don't think it will be useful, not useful at all). Participants were asked to score their perception of each statement.

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 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 student before the class started and four months after the class finished. The subjective measurement in this part measured students' perception in the importance of 1) having enough balance checking account is important for my life, 2) applying frugal living is important, 3) having an emergency fund is important, 4) spending on essential goods is important. Beside measure perception the importance of some topics in saving and expense management, this research also measures student intention in the saving and expense management, here are some statements to measure student intention: 1) I will save more money in the future, 2) I will apply frugal living, 3) I will start collecting money into emergency funds, 4) I will differentiate consumptive spending and productive spending. The subjective measurement has been assessed before the class and right after the class ended.

Students were asked several questions to assess the investment knowledge, there are: 1) benefit of investment, 2) risk without investment, 3) risk preference, 4) rill hedge instrument, 5) principle of investment, 6) return of bond and deposit, 7) return of property investment, 8) return of farm investment, 9) return of agriculture investment, 10) identify investment fraud. On the other hand, measurement for the debt management topic, student has been assessing the knowledge about 1) risk of debt, 2) productive debt, 3) consumptive debt, 4) mortgage decision, 5) vehicle loans, 6) how to avoid the debt, 7) conventional and sharia/Islamic debt, 8) frugal living, 9) benefit of being debt-free, 10) sticky cost of debt.

3. MAIN FINDINGS OF THE DISSERTATION

3.1. First stage findings

This study summarized the findings into two stages. First stages aim to find out the most critical topics to learn personal finance for university student. In this stage, the summary of the findings is shown in Table 4 below.

Table 4. Keywords that are used to classify the adult financial problems

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)

3.2. Second stage findings

The aim of the second stage was to identify the critical factors to develop financial education material. These findings were the syntheses of previous research in financial education, theory that related to the financial decision, learning style of targeted participants and existing financial education curricula. Table 5 shows the summary findings of the second stage.

Table 5. Summary of second stage findings

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)

3.3. Third stage findings

The aim of the third stage was to develop financial education material for university student. The process of development was start from the preference topics for university student as the result from the first stage. Then develop the material using three key factors as a framework from the second stage. Table 6 shows the summary of financial education materials. On each topics we can see what material is used to induce the key factors, there were also maximum minutes that can be used to explain the material.

Table 6. 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 minutes practice and discussion)	Tailored for university students: - Teach the practical way to save your money (5 minutes) - 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)

3.2. Fourth stage findings

Students come from both economics and non-economics faculties to make the sample more heterogeneous. Heterogeneity of student background is essential, as it will increase the probability of this result to generalise into the more significant sample in Indonesian. 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 7 explains the sample's demographics.

Table 6. 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 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 of the participants was required to join the four-week-class in each group (treatment and control). Each online class took 1,5-2 hours. There were 20 classes in total which is 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.

3.2.1. The impact of financial planning course on student behaviour

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.

Table 8 describes the summary of descriptive statistics from three groups (pre-test, post-test financial planning session and pre-test, post-test control variable).

Table 7. 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	35.91	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
T-test paired sample P(t<=t) one-tail		0,000		
T-test independent sample P(t<=t) one-tail				0,000

Source: Author's calculation (2021)

Table 8 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 8, 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 8.

The difference variance between the control and treatment groups requires a t-test independent sample with unequal variance. It was 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. 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 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 9 shows the summary of the results.

Table 8. Subjective assesment 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 9, it can be seen 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%.

3.2.2. 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 10 presents the summary of descriptive statistics and paired sample t-test of the checking account on the participants.

Table 9. Summary of the result 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	16.257.49	17.392.39	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
t-test independent sample two-tail				0.007

Source: Author's calculation (2021)

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.

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. It was also found 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.

3.2.3. 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 11 shows the summary of descriptive statistics and result of paired sample t-test for treatment and control group.

Table 10. 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	47,08	60,25	48,38	48,80
Mean Difference		13.17		0.42
Standard Deviation	15,05	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
t-test independent sample p-value				0,00

Source: Author's calculation (2021)

Based on Table 11, 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.

The result of t-test independent sample between treatment and control group was found statistically significant, which means the two-group were found to have a different score. The mean score in Table 11 shows that the treatment group (60,247) has a higher score than the control group (48,801).

It can be concluded that participants who joined the customized financial education especially in the investment course have higher investment knowledge compared to participants who joined the conventional financial education.

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

Ten objective measurements were applied to measure student 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. There are several requirements to state the debt management class had better impact on the participants compared to the conventional financial education class:

1. the increasing score between pre and post-test on treatment group should be higher than the control group,
2. the difference test should be statistically significant in the pre and post-test on the treatment group, and
3. the score on post-test treatment group should be statistically higher than the score on the post-test control group.

To examine that stage, a t-test paired sample and t-test independent was used. Table 12 summarizes the results of the t-test.

Table 11. 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	20,05	18,30
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 12 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.

4. NEW AND NOVEL RESULTS OF THE DISSERTATION

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 synthetizing 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.

5. PRACTICAL APPLICABILITY OF THE RESULTS

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.

List of Publications

Ascaryan Rafinda

Publications related to the dissertation:

1. **Rafinda, A**. – Gal, T. (2022): Covid-19 Pandemic and Its Impact on Household Financial Behavior in Indonesia. Oradea Journal of Business and Economics (OJBE), July Vol 7. (Letter of Acceptance).
2. Suroso, A. - **Rafinda, A**. (2021): Motivation of SME adopt digital marketing. *International Journal of Innovation, Creativity and Change*, 15(9). pp. 696-710.
3. **Rafinda, A.** - Gal, T. (2020): Financial Literacy of Economics and Non-Economics Students. *International Review of Management and Marketing*, 10: 3, pp. 35-38.
4. **Rafinda, A**. - Suroso, A. - Gal, T. (2020): Predictive Power of Situational Factor and Individual Factor in Misreporting Behavior. *International Review of Management and Marketing*, 10: 1, pp. 84-90.
5. Suroso, A. - **Rafinda, A.** (2020): The Evaluation of Entrepreneur Incubation Program at Higher Education. *International Journal of Entrepreneurial Knowledge*, 8(2), pp. 14-26.
6. **Rafinda, A**. - Gal, T. - Purwaningtyas, P. (2019): Business Ethics Course Is Student Moral Reasoning. *Oradea Journal of Business and Economics*, 4: Special Issue, pp. 60-73.
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8. **Rafinda, A**. - Gal, T. - Rafinda, A. - Suroso, A. - Purwaningtyas, P. (2018): Procedural Justice of Government Agencies in Banyumas Regency. *Journal of Applied Economic Sciences*, 13: 6 (60), pp. 1782-1790.

Other publications:

9. **Rafinda, A.**, Gal, T., Rafinda, A., Purwaningtyas, P: The effect of financial incentives on task attractiveness and individual performance. Performance: Jurnal Personalia, Financial, Operasional, Marketing dan Sistem Informasi. 28 (1), 54-66, 2021.
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List of publications related to the dissertation

Articles, studies (8)

1. **Rafinda, A.**, Gál, T.: COVID-19 pandemic and its impact on household financial behavior in Indonesia.
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