

**EVALUATION OF MONEYSENSE-SINGAPORE POLYTECHNIC INSTITUTE
FOR FINANCIAL LITERACY'S (IFL) PROGRAM**

Final Report

17 Nov 2016

Sumit Agarwal

Zoe Yang

National University of Singapore

Table of Contents

1. Introduction	4
2. Description of IFL’s Program.....	5
2.1 Audience of the Program.....	5
2.2 Organisation and Presentation of Content in Modules.....	7
2.3 Mode of Delivery.....	7
2.4 Venues used to Deliver Financial Education.....	8
2.5 The IFL’s Current Evaluation Approach: Feedback Forms and Online Surveys.....	8
3. Conduct of Evaluation Study.....	10
3.1 The Use and Challenges of Randomization Control Trials (RCTs).....	10
3.2 Self-selection Bias: Voluntary Group vs. Compulsory Group.....	10
3.3 Longitudinal Study	12
4. Questionnaire Design	12
4.1 Part 1: Issues in designing Part 1 of the survey.....	13
4.2 Part 2: Participant Feedback and Satisfaction with Program	14
4.3 Part 3: Financial Knowledge Assessment	14
4.4 Part 4: Financial Situation and Behaviors	15
4.5 Other Surveys Conducted: 1). Facilitator Interaction Survey	16
4.6 Other Surveys Conducted: 2). Pilot Survey and Data Collection.....	17
5. Baseline Financial Literacy Survey and Data Collection.....	19
6. Description Statistics and Survey Result Analysis.....	21
6.1 Part 1: Biography.....	21
· Basic Demographic Information.....	21
· Income and Employment Status	22
· Housing.....	23
· Education	25
6.2 Part 2: Program Evaluation – Participant Satisfaction and Feedback	30
6.3 Part 3: Financial Literacy Evaluation Findings	35
· Basic Financial Literacy Questions	35
· Module Specific Financial Literacy Questions.....	39
6.4 Part 4: Financial Situation/Behavior	47
7. Econometric Model on Financial Literacy and Consumer Behavior	51
8. Two-Group Comparison and Behavior Change Analysis	53
9. Discussion and Concluding Remarks.....	56
9.1 Administrative work.....	57
9.2 Learning Modules.....	57
9.3 Post-learning.....	58
9.4 Periodic Evaluation and Review of the Program	58
Reference.....	63
Appendix A: Facilitator Interaction Survey in July 2015.....	65

Executive Summary

This report provides an analysis of whether the financial education program conducted by the Institute for Financial Literacy (IFL) meets its set objectives and leads its participants to enhance their financial knowledge and to change their financial behaviors.

The report first examines the services provided by the IFL based on the target audience, study material, delivery mode, program venue, and pre and post surveys currently used by the IFL. Using a proposed evaluation framework, the study conducts face-to-face interviews with module instructors to understand how the content is being delivered from the instructors' perspective. We design a structural questionnaire to collect comprehensive information on participants' personal characteristics, financial knowledge, financial behaviors, and opinions and perceptions towards the program.

The study takes advantage of the opportunities to partner with various participating organizations to implement a longitudinal analysis. Survey data is collected once after the workshop (baseline survey) and once more three months later (follow-up survey) to assess the program effectiveness.

We collected four different samples:

1. *The Baseline Survey*

The study surveys program participants from nine randomly chosen modules between March 2016 and July 2016. Participants took the baseline survey immediately after class. 381 respondents completed the questionnaire, and a total of 629 survey questionnaires were collected to evaluate participants' learning outcomes and understand the key determinants of financial literacy. The detailed summary statistics are provided in Section 5 of the report.

2. *The Pilot Survey*

A pilot survey was conducted in January 2016 to test the study procedure and address the potential self-selection bias as most participants in the baseline survey would be from the compulsory group. The pilot survey collects the comparative number of samples (110 responses) from both the compulsory group and voluntary group and provides evidence that the self-selection issue would not lead to a biased evaluation in the study. The findings from the baseline survey are representative and can be generalized to the wider population of IFL's audience.

3. *The Control Group Survey*

The study also collects 34 copies of questionnaires completed by individuals who did not receive financial education at the time of being surveyed. Statistical techniques, such as propensity score matching, are used in the analysis to minimize the differences in socio-demographic characteristics between the control group and the treatment group. The results show that the basic knowledge score, program-specific knowledge score, and confidence

level increased after participation.

4. The Follow-up Survey

To identify any changes in participants' financial knowledge and behaviors, we sent an email with a web link to participants who had provided their contact information and received feedback from 23 of the 245 participants. The results do not show a significant drop in financial knowledge due to memory decay and indicate significant positive changes in the participants' financial behaviors, such as reduced debts, new financial goals, and better financial investments.

An econometric model is developed to assess the factors that contribute to the success of the program. The cross-sectional analysis reveals a significant positive relationship between financial education and cognitive ability. The regression analysis also shows that income, education attainment, ethnicity, financial sophistication, and habits are important factors that affect financial literacy.

The final part of the report offers specific advice on how future evaluation can be conducted and improved. A suggested evaluation framework with the key components is demonstrated at the end of the report. We include issues that are not covered in the current assessment framework due to logistic or administrative constraints. In short, we suggest the following improvements:

- Narrow the scope of individual modules to focus on critical concepts, policy updates, and recommended practices, rather than present too much information at once.
- Emphasize the importance of adopting best practice financial behaviors and well-established attitudes and reduce the length of lectures on topics related to mathematics and calculations.
- Provide program participants with reliable online resources or mobile applications to help them with financial budgeting and planning and the selection of financial products.
- Offer financial advice after the workshop through various channels, such as email, phone, and online chat, and adopt more real-time responses.
- Introduce a web-based form and online registration system to facilitate the booking of appointments for the purpose of future evaluation.
- Review the program regularly and obtain sufficient funding for program improvement and development.

Evaluation of MoneySENSE-Singapore Polytechnic Institute for Financial Literacy's (IFL) Program

1. Introduction

Financial literacy has become a widely discussed topic among researchers, policymakers, and the general public. Financial literacy can be defined in a number of ways (Dawes, 2014; Fox, Bartholomae & Lee, 2005; Hung, Parker & Yoong, 2009; Huston, 2010; Lusardi & Mitchell, 2014; Vitt et al., 2000). Fox and Bartholomae (2008) define financial literacy as an individual's understanding and knowledge of financial concepts and services, which are critical to effective financial decision-making. Burdensome consumer debt, low saving rates, and records of bankruptcy are commonly considered as the result of low financial literacy levels (Fox and Bartholomae, 2008). Studies have shown that unsophisticated investors rarely make smart financial decisions regarding choosing retirement plans (Lusardi and Mitchell, 2007b), mortgages (Moore, 2003) and debt management (Lusardi and Tufano, 2011).

Various financial literacy programs are available to provide individuals with the knowledge and skill set needed to select suitable financial services and manage their finances effectively. However, the advantages and disadvantages of these programs have yet to be examined closely. While there is evidence that some programs have a general positive effect on financial behavior, it remains unclear which programs and teaching methods work best for specific audiences. Thus, a critical assessment of financial literacy programs is needed.

MoneySENSE is a national financial education program launched in Singapore by then Deputy Prime Minister Lee Hsien Loong who was concurrently Chairman, Monetary Authority of Singapore (MAS) on October 16, 2003. The program aims to provide free and unbiased financial education to the general public to help them enhance their understanding of basic financial investment, management, and planning. In 2012, MoneySENSE collaborated with Singapore Polytechnic to launch the MoneySENSE-Singapore Polytechnic Institute for Financial Literacy (IFL).

This report strives to establish an effective framework for evaluating financial education programs. The purpose of the evaluation is to assess whether the financial education program conducted by IFL leads participants to enhance their financial knowledge and change their financial behaviors. By using a robust evaluation method, the report seeks to determine whether and how the program meets the set objectives, and the impact the program has on participants' financial behaviors.

The report proceeds as follows:

Section 2 introduces the program offered by IFL and analyzes the program qualitatively in terms of its target audience, study material, delivery mode, venue of the programs, and feedback from facilitators.

Section 3 introduces the empirical approach and use of RCTs.

Section 4 provides a detailed description of the structured questionnaire designed for the evaluation.

Section 5 discusses the empirical evaluation of the financial literacy program provided by the IFL. Conducted from March to July 2016, the baseline survey and follow-up study help to understand the impact of financial education on consumer behavior and assess the contents and structure of the program based on unbiased feedback from program participants. To capture the heterogeneity in demographics and socio-economics of the program participants, as well as the various topics designed in the financial literacy survey, the report first describes the survey procedures used and provides a detailed analysis of the survey results. In addition, the study uses econometric analysis to study the program effects and examine the relationship between financial knowledge and financial behavior.

Lastly, the report offers specific and practical advice on how financial knowledge can be more effectively translated into action.

2. Description of IFL's Program

IFL's financial education efforts are varied to suit audience and subject matter. To enhance the basic financial knowledge of consumers, IFL offers 21 regular modules covering a wide range of topics including financial budgeting, debt management, insurance and retirement planning, investing and consumer protection, targeting varying age groups, from 16 years to 60 years.

2.1 Audience of the Program

Based on IFL's status report in May 2016, the total number of organizations trained by IFL was 475, of which 67 were new organizations that had participated in its financial education program in the period between 17 November 2015 and 16 May 2016. Each program is conducted by a trainer/facilitator giving either a talk or workshop lasting from 1 to 1.5 hours and 2 to 4 hours respectively, and attended by approximately 20 to 150 participants. As shown in Table 1, IFL's financial literacy program reached its 5-year target by the third year and this is a strong indication of a huge demand for financial education in Singapore.

Based on a sample of 10,496 PME survey respondents from workshops and talks conducted between 17 November 2015 and 16 May 2016 (Institute of Financial Literacy, 2014), 49.5%

of these respondents attended workshops. With regard to demographic characteristics, 41.7% of the respondents were female, 54.3% were male; Chinese, Malays, and Indian contributed 60.0%, 17.6%, and 6.7% respectively; Singapore citizens, Singapore Permanent Residents, and foreigners were 71.4%, 4.8%, and 1.6%, respectively; About 54.7% of the respondents were in the age range of 21 to 40 years old; 32.4% of them were married with dependents and 23.4% were single without dependents; Approximately 53.8% of them held either an ‘A’ Level certificate, Diploma or a Bachelor Degree; 28.2% of them had an annual household income range (before taxes) of \$30,001 to \$60,000.

Table 1: Number of Classes Conducted and the Five-Year Target

	May 2012 to June 2017	Completed by 16 May 2016
Classes	990	2,595
Participants	45,540	82,113

While some modules focus on educating audiences with a similar background, such as officers aged 18 to 25 from the Ministry of Home Affairs; Year 1 to Year 3 students from Republic Polytechnic, and low wage worker, other modules serve an audience of various age groups from the same organization, such as staff members in their mid-20s to mid-50s from Immigration & Checkpoints Authority (ICA). In Singapore’s multicultural environment, the financial literacy program also meets the needs of non-English speaking groups by offering popular modules in Mandarin Chinese and Malay. There has been no or little demand for modules to be conducted in Tamil.

There are two types of participants: voluntary participants and compelled participants. In a typical case, a prospective participant or organization can directly contact the IFL or fills out an online application via IFL’s website. Individuals who participate in the program voluntarily may focus on the course more so than compelled participants. More specifically, the in-class observations showed that, on average, voluntary participants asked more questions, communicated more with instructors, and take more notes than compulsory participants. Compulsory participants usually come from government departments, such as the Ministry of Home Affairs, which required employees to complete several modules in a set period. The sample in the baseline survey primarily consists of compulsory participants who come from the Ministry of Home Affairs, which may lead to selection bias to some degree, a pilot survey was conducted before the baseline survey, to study the difference between compulsory and voluntary groups and eliminate potential selection bias. Analysis in Section 3.2 shows that although the voluntary group and compulsory group may have different motives for participating in the program, the evaluation outcomes suggest no statistical differences in learning outcomes, as measured by knowledge, attitude, confidence, and intention scores, between two groups.

2.2 Organisation and Presentation of Content in Modules

IFL's modules are comprehensive in depth and breadth, cater to different needs and enable participants to achieve broad understanding of concepts in the particular topic. Most talks and workshops provide course materials in booklets. The same contents are also presented in PowerPoint slides. A module usually contains six parts: course and concept description, case study, practical examples, calculation-related practices, graphical presentation, and experience sharing.

The study materials are information-heavy and well-organized with the more popular IFL modules being: investment planning, retirement planning, and money management. For instance, Making Sense of Your Money is the most frequently conducted module, which provides participants with a 36-page booklet. The module starts with an introduction of financial planning and financial goals. The facilitator first explains some hypothesized scenarios and then follows up with group discussions in which participants set financial goals. The module then walks participants through the procedures of financial budgeting and then supplements with five in-class activities. The last part of the module is about debt management and the concept of compounding.

In addition to an in-class activity that encourages group members to calculate the total cost of paying by installments for a purchase, the module includes a quiz game and a case study about the computation of credit card interest rates. In addition, good, localized real-life examples for the modules are injected into the module to help participants to better understand financial concepts, introduction of new policies, and consequences of bad financial management. The booklet also provides insightful suggestions and useful guidelines to help participants improve their financial decision-making.

2.3 Mode of Delivery

The common delivery methods used in financial education programs worldwide include in-person groups, telephone groups, one-on-one education, the Internet, educational materials, and mass media. The most common delivery approach used by the IFL is in-person workshops and talks, which allow educational providers to have direct contact with participants and receive immediate feedback. In-class activities and games also help participants to benefit from interesting and interactive learning. Participants engage in teamwork, which provides opportunities for them to share personal experiences and stories. In addition, in-class observations show that participants may be reluctant to share personal financial plans or debt situations in their assigned groups. The study focuses on evaluating the teaching outcomes of workshops.

In addition, IFL offers e-learning modules, e-books, mobile applications, road shows and networking events to supplement talks and seminars. For the period between 1 Jan 2015 to 6 Oct 2016, out of 40,706 users accessing and using IFL's E-Learning modules, about 17%

come from Singapore. Based on Google Analytics for IFL's website (finlit.sg), in the period between 01 January 2015 and 06 October 2016, the most popular page was IFL's home page followed by its public events page and programmes page.

2.4 Venues used to Deliver Financial Education

Talks and workshops are usually demand driven, so modules are arranged to be conducted at times and places convenient to the organizations requesting them. For instance, colleges and universities, such as Singapore Polytechnic and the National University of Singapore, public and regional libraries, local community centers, and workplaces of companies participating in the program. Discussing the effectiveness of financial education in the workplace and in schools, Agarwal et al. (2011) point out that workplace seminars increase financial literacy by increasing peer effects. In-class observations and feedback from facilitators indicate that talks and workshops held at small venues are more effective than large venues, such as lecture halls. First, it is difficult for facilitators to pay close attention to and interact with participants in classes with more than 25 students, which is the effective class size that education literatures suggest. Second, participants who sit at the back of a large classroom may not be able to hear the facilitator very clearly and may be less engaged. Last but not least, large classrooms make discussion and group work difficult. Thus, experience sharing and case studies are less likely to be chosen by facilitators leading more than 100 participants.

2.5 The IFL's Current Evaluation Approach: Feedback Forms and Online Surveys

Currently, the IFL conducts evaluations for talks and workshops. Data is collected through feedback forms and web-based technology. Pre-evaluations and post-evaluations are conducted for workshops. Pre-evaluation examines participants' financial knowledge and confidence. Post-evaluation examines participants' financial knowledge, confidence, and intention. For talks, surveys are conducted once at the end of the session. Participants are encouraged to complete a self-reported survey or use their mobile device to go to a specified website to answer the survey questions. Identical items measuring financial knowledge and confidence are used in the pre-evaluations and post-evaluations to compare participants' scores before and after the module. The current evaluation collects cross-sectional data, which can compare different population groups at single point in time, however, cross-sectional survey results cannot be used to assess the causal impact of the financial program and analyze participants' behavior change.

According to IFL's status report in May 2016, the response rate was 62.2%. Out of 5, the participants' average ratings ranging between 4.16 and 4.37 on items measuring their satisfaction with course content and delivery; indicate a high level of satisfaction.

To measure incremental changes in financial knowledge, IFL survey includes five questions relevant to the topic. As shown in Table 2, the results in May 2016 indicate that the program has significantly increased the level of financial literacy and confidence. Since the questions were straightforward and purely based on the study materials, participants will get a high mark as long as they were involved in class, which may lead to upward biased evaluation results and overestimate the impact of financial education program. In particular, the effectiveness of a financial education program should be determined by its long-term impact on participants' behavior, instead of a superficial victory caused by short-term memory.

Table 2: Survey Results in May 2016

	Pre-test	Post-test
Level of financial literacy	2.02 out of 5	3.11 out of 5
Level of confidence	11.86 of 20	14.50 out of 20

Online surveys simplify the data collection process and can prevent the survey results from being manipulated by individuals other than the participants. Data collected through online surveys are less likely to be affected by reporting biases than data collected through paper-based survey and telephone interviews (Chang and Krosnick, 2009). However, results from web-based surveys rely on participants who have access to the Internet when attending the program. This means that participants who do not have a mobile device, Internet access, or experience with online surveys, such as low-income individuals or seniors, may be unable to complete the survey. The attrition problem can be solved easily if the program organizer can provide conventional survey forms to those who are unable to conduct the online survey. It should be noted that both feedback forms and online surveys are based on self-assessment, which relies on subjective opinion and qualitative data. This means that they lack the objective measures needed for effective, unbiased program evaluation. Moreover, participants may be reluctant to report data on personal savings or debts (OECD, 2013).

Many financial regulators and financial education providers around the world gather feedback through phone surveys. The Financial Service Authority (FSA) in the U.K.¹ and the Ontario Securities Commission in Canada use follow-up phone calls to collect feedback from participants 3 and 6 months after workshops. IFL does not conduct follow-up phone calls to assess changes in behavior and intention. Conducting follow-up phone calls may be costly and difficult due to low response rates in Singapore (attrition and selective bias). For instance, in a randomly chosen module, 5 out of 25 participants were willing to participate in a follow-up study about the program's effectiveness, and only 2 of the 5 participants were willing to leave their phone numbers, which poses challenges in collecting longitudinal data. Though combining cross sectional survey and follow-up study is

¹ The capital market regulator in the UK, FSA, works with private sector partners to increase financial capability in the UK. See http://www.fsa.gov.uk/pubs/other/financial_capability_uk.pdf and <http://www.fsa.gov.uk/pubs/consumer-research/crpr69.pdf> for detail.

essential for program evaluation, longitudinal study can measure knowledge retained by individuals long after participation, and identify behavior changes over time and the extent to which such changes are long-lasting.

3. Conduct of Evaluation Study

3.1 The Use and Challenges of Randomization Control Trials (RCTs)

With the RCTs design, participants will be randomly selected from the population and assigned to one of two groups: treatment (experimental) group and control (comparison) group. The financial literacy and behaviors of the randomly selected participants will be evaluated using a structured questionnaire that will be administered immediately after the module and then three and six months afterwards.

A well-conducted randomization process ensures that all participants have the same chance of being assigned to either the treatment group or the control group, making the groups statistically equivalent in motivation and socioeconomic and demographic characteristics at the beginning of the study. Randomized trials ensure that outcomes of the control group capture the counterfactual for the treatment group, indicating what would have happened to the participants had they not attended the program. The differences in outcomes between the treatment and control groups can be attributed to the causal effects of the financial education program.

A challenge facing RCTs is the need for a large sample size to measure program effects with statistical precision. Researchers are bound by a code of ethics that requires them to obtain voluntary informed consent; subjects have the right to decline participation in research and withdraw at any stage. Thus, researchers may have difficulty attracting a large number of voluntary participants to achieve the target sample size.

Volunteer bias is another challenge in the design and execution process of RCTs. Central to research ethics is the concept that participation must be voluntary. However, volunteers do not have the same characteristics as the general population (Moore, Rosenthal and Rosnow, 1976). This may mean a reduction in the homogeneity of the characteristics between the sample and the general population in Singapore, affecting the representativeness of the sample and threatening the external validity of the study.

3.2 Self-selection Bias: Voluntary Group vs. Compulsory Group

To deal with potential self-selection bias, RCTs was carried out in the study and voluntary program participants, compulsory program participants, and non-participants were surveyed. It is worth noting that participation in the survey is purely voluntary. The IFL will circulate the survey questionnaire after the module and ask participants to take part voluntarily. Therefore, the voluntary program participants will consist of individuals who are

voluntarily registered in the program, while the compelled program participants will consist of individuals belonging to organizations using the financial literacy program as part of their employee training plan.

Table 3: Participation of Subsamples

Survey Participation	Financial Literacy Program Participation	
	Voluntary	Compulsory
Voluntary	Group 1: Collectable	Group 2: Collectable
Compulsory	Group 3: Not Collectable	Group 4: Collectable

Two types of survey participants, referred to as “volunteers among volunteering” and “volunteers among compelling”, will be used in this study (see Table 3). The former group will consist of participants who voluntarily joined the program and voluntarily participate in the survey. Agarwal et al. (2011) found that the exposure to treatment may be correlated with unobserved traits that affect outcomes when participation is voluntary. Research has shown that individuals who seek financial advice and education tend to be of higher socioeconomic status (Agarwal et al., 2015) and to show a greater interest in or concern for effective financial decision-making. Compared to the general population, these individuals may be more motivated to address their financial behaviors. As a result, the outcomes of this group may not be representative of the general public. Nevertheless, from a policy perspective, it is useful to look at financial literacy among sub-groups to identify those with lower levels of knowledge, who may be more financially vulnerable.

Therefore, the analysis will be supplemented by the latter group, “volunteers among compelling”, which will consist of participants from particular organizations, such as PSA Corporation Ltd. and the Ministry of Home Affairs. The organizations have voluntarily joined the study and are interested in the impacts of the program on employee development. It is compulsory for employees from these organizations to attend financial literacy classes as part of their training, and they will be asked to voluntarily participate in the survey circulated after the classes. Therefore, this group is not expected to suffer from volunteer bias.

Agarwal et al. (2014) explored the effects of mandatory mortgage counseling and concluded that mandatory counseling did not materially change consumers’ mortgage choice. Another study by Agarwal et al. (2015) dealt with a diametrically opposite approach to financial education, a long-term voluntary participation program for prospective homebuyers. The study found a positive relationship between voluntary financial counseling and financial decision making, pointed out that the effects of counseling tend to persist over time. In this study, we construct two samples and compare the behaviors of volunteers and compelled participants, which helps to address the potential self-selection issue in the financial literacy study. The survey results suggest no significant differences between the two groups of participants.

Understanding the behavior of volunteers is important in the sense that the potential audience of financial education programs will most likely be participants who would voluntarily attend the classes. The compelled participants will allow us to draw broad conclusions from this survey, study the program impacts on the general public, and provide valuable information on the development of similar programs in other countries or in different contexts.

3.3 Longitudinal Study

While cross-sectional studies compare different individuals who share the same characteristics, longitudinal studies track the same person over a longer period of time and allow for more accurate observations because differences in the outcomes are less likely to be the result of socioeconomic and demographic differences. More importantly, longitudinal studies allow for the identification of longer-term effects.

In this study, a follow-up survey was conducted three months after attendance at the program to measure the amount of financial knowledge retained by the program participants and compare the changes in behavior outcomes that are attributed to program effects.

Follow-up surveys required the participants to fill out an online questionnaire. The same questions used in the first survey, which assesses the respondents' financial knowledge and financial behaviors, were used again in the follow-up surveys to compare changes in the participants' financial knowledge, attitude, intention, confidence, and behaviors.

Evaluations of financial programs in many other countries lack the resources needed for longitudinal studies. Vitt et al. (2000) reported that only 58 of 90 programs in the US use follow-up measures to assess how participants have applied what they learned in the program. This study takes advantage of the opportunity to partner with various participating organizations, companies, and individuals, to evaluate the persistency of financial behaviors and provide valuable insight into the long-term effects of financial programs on participants' financial well-being.

4. Questionnaire Design

A structured questionnaire was designed to collect comprehensive information on participants' personal information, financial situation, and financial knowledge. The questionnaire would help us to understand the issues and challenges facing the program participants, measure the amount of financial knowledge retained by the participants, and assess the changes in participant behavior and attitude after the program.

The IFL currently offers 21 regular modules covering a wide range of topics, including financial budgeting, debt management, retirement planning, and investment and consumer protection. Therefore, a comprehensive survey questionnaire was designed to better evaluate the financial education program in Singapore. Each questionnaire sets out both baseline and follow-up components, which incorporate questions from IFL's existing evaluation template. Data is collected after the workshop (baseline) and then three months later to study the effectiveness of the program.

The questionnaire was designed to take approximately 12 to 15 minutes to complete and comprised four parts: respondent's basic information and demographics, program evaluation, assessment of financial situation, and financial knowledge. The questionnaires were paper and website-based, and participation in the survey was voluntary.

4.1 Part 1: Issues in designing Part 1 of the survey

Part 1 consists of questions asking respondents to identify their personal and family circumstances, income and employment status, and housing situation and educational level. Van Rooij et al. (2011) found that the proportion of correct answers varies depending on the wording of the questions and provided evidence indicating that respondents often guess the answers, which create noise in the measurement of financial literacy. The last two questions in Part 1 ask participants to self-assess their English language skills and indicate whether English is their first language.

Previous research has shown that "do not know" answers identified respondents with very low levels of financial knowledge (Lusardi and Mitchell 2006, 2007a; Lusardi and Tufano 2009; van Rooij, Lusardi, and Alessie 2007). Thus, the survey respondents in this study are provided with options, such as "do not know" and "refuse to answer", which help to understand whether the respondents truly know the correct answer to the financial literacy questions and decrease the measurement bias of financial literacy measures.

Research has shown that consulting with friends and colleagues takes an important role in financial decision-making (Lusardi and Mitchell, 2006; van Rooij, Lusardi, and Alessie, 2007; Agarwal et al., 2015). Moreover, Jorgensen and Savla (2010) surveyed 420 college students in the US and found that perceived parental influence had a direct and moderately significant influence on financial attitude and financial knowledge. They concluded that parents influence financial behavior through their financial attitude. Thus, our survey allows for the measurement of exposure to financial knowledge via family and peers. The questionnaire includes questions about the educational background of the participants' parents as well as their peers to investigate the impact of both effects. In light of the work by Agarwal et al. (2015), one question uses the percentage of peers who graduated from college as a proxy for peer education attainment.

4.2 Part 2: Participant Feedback and Satisfaction with Program

Part 2 is a set of statements requesting respondents to indicate their satisfaction level and provide feedback on the program. Some questions were used in the Facilitator Interaction Survey, which was conducted in July 2015. For instance, questions about the respondents' understanding of the study materials, the difficulty level, and the perceived relevance of the information were used in both surveys. These questions allow us to compare answers provided by program facilitators with those provided by program participants.

In addition to the questions about the contents and effectiveness of the module, the questionnaire will ask respondents whether their participation in the module was compulsory and why they decided to participate in the survey, thereby identifying the volunteers in the sample and highlighting the extent to which volunteer bias could have reduced the external validity of the findings.

4.3 Part 3: Financial Knowledge Assessment

Part 3 is comprised of two parts, the basic financial literacy questions and the module specific questions. The first question in Part 3 will ask respondents to assess their personal financial knowledge using a seven-point scale. This question can help to identify any mismatches between perceived and actual knowledge (Lusardi and Mitchell, 2011). A study by Lusardi and Mitchell (2011) found that approximately 70% of the respondents overestimate their financial literacy, indicating that the perceived financial literacy level is generally higher than the actual financial literacy level.

The first three basic financial literacy questions were designed by Lusardi and Mitchell (2006) and the latter two questions were designed by Van Rooij et al. (2011) to examine participants' fundamental understanding of compounding interest rate, inflation, risk diversification, time value of money, and money illusion. These questions have been widely used as the benchmark in financial literacy research to evaluate financial literacy level and differentiate between naïve and sophisticated respondents.

Many financial education programs evaluate program successfulness based on outcomes such as obtaining a bank account/mortgage/insurance, buying a home, and managing a debt. This approach tends to be one-sided as financial well-being includes not only the dollar amount of net worth, but also a sense of security, level of satisfaction, and confidence in financial decision-making. Therefore, the module specific questions survey respondents' financial knowledge, attitude, intention, and confidence level.

To enhance the accuracy of measuring financial knowledge, with the exception of the five questions that measure basic financial knowledge, participants answer a set of questions designed specifically for each module. The questionnaire was adopted from surveys used in previous financial literacy studies and the IFL's current evaluation survey. The IFL currently offers 21 modules on different topics. Thus, compared with survey questions used

by other studies, this questionnaire covers more topics, such as home financing, insurance, and estate planning, and allows for a comprehensive analysis of the effects of financial education on every aspect of life.

Designing questions specific to each module has several advantages. Some participants who are keen on increasing their financial literacy will attend multiple modules. Administering a different questionnaire for each module will help to capture the effects of attending a specific module and increase the accuracy in measuring participants' financial knowledge. In addition, their outcomes are expected to be more favorable than those who attend only one module. Specially designed questions can deal with this problem by estimating the impact of each module more accurately. The questions also allow for the comparison of participants who attend multiple modules with those who attend a single module. Therefore, the use of different questionnaires provides valuable opportunity for assessing the relationship between financial literacy and specific behaviors, such as home purchasing, insurance choosing, and retirement planning.

4.4 Part 4: Financial Situation and Behaviors

Part 4 is a set of questions asking respondents to rate their perceived financial situations to study changes on financial standing and behavior in the longitudinal study. Respondents answer questions related to their financial situations, such as information about financial products, banking services, bank card, financial assistance, insurance, and debt status. Since expected changes in financial behavior outcomes are small and the access to administrative data is difficult, the survey questionnaire will aim to detect changes in behavior or decisions that can affect long-term financial outcomes and behaviors. In this section, we include several yes-or-no questions to study these behaviors.

The wording of survey questions may be one of the most important and least understood areas of questionnaire research. To avoid any confusion or leading questions, we studied previous national surveys and carefully reviewed our survey questions. For example, the sixth question² in Part 4 is used to measure retirement planning behavior, with wording similar to the question in the 2004 Health and Retirement Study (HRS). We also selected some questions from the Household Surveys of Financial Literacy of the World Bank to gather information on the use of financial services and behaviors regarding household budgeting and investment.

The questions were also designed to deal with potential bias. For instance, it is important to identify peer effects, which refer to a possible endogeneity in the network. Individuals with similar values are more likely to form a link. According to a study by Hong, Kubik, and Stein (2004) and Agarwal et al. (2015), churchgoers are more likely to invest in stocks and,

² "Have you and your partner ever tried to find out how much you would have to save today to reach a certain standard of living at old-age? [] Yes [] No"

therefore, the frequency of attending church can be used as a proxy of social interaction. However, participants with no religion rarely go to church, a question measuring the frequency of communication with friends about financial topics was included, to control for peer effects that are correlated with the outcomes and to supplement the measurement of peer social interaction.

4.5 Other Surveys Conducted: 1). Facilitator Interaction Survey

An in-person interview with facilitators from the IFL was conducted as part of the program evaluation process. A sample of the Facilitator Interaction Survey is presented in Appendix A. The survey was set out to measure interactions between facilitators and participants and determines how well the course material was being received from the facilitator's perspective. Six out of eight full-time facilitators completed the survey.

The survey asked questions about the perceived frequency in which facilitators actively (Q3) and passively (Q4) interacted with participants. The results indicated that facilitators found workshops to be more interactive than talks and suggested that participants engaged facilitators less frequently than facilitators did with participants. In addition, facilitators felt that participants were involved in the module(s) and showed interest in the topics (Q5). One of the facilitators indicated that participants were not very involved in modules when conducted in the form of a talk.

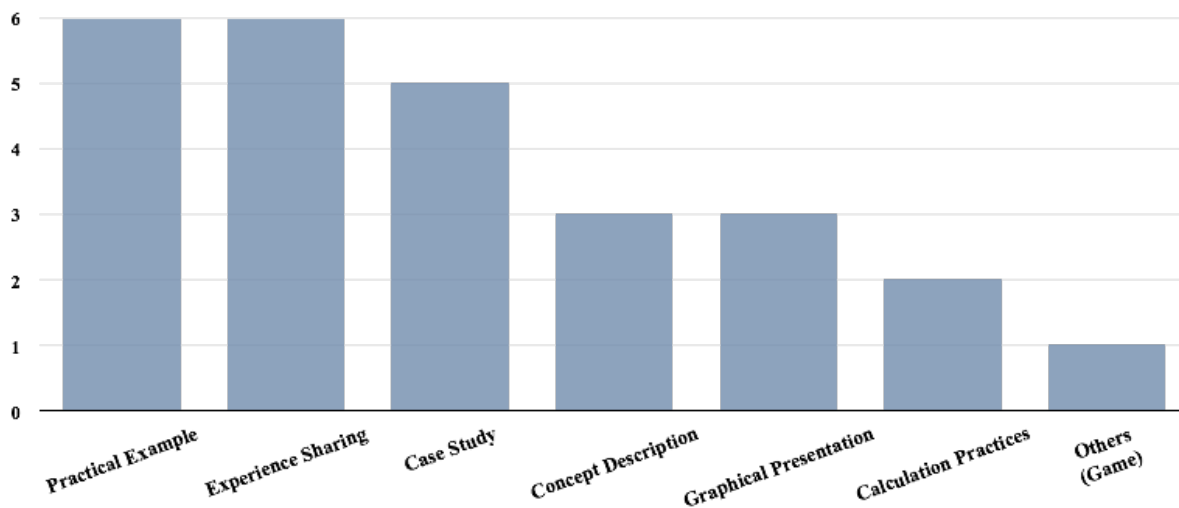
With regard to the contents of the study materials (Q7 and Q8), only one facilitator indicated that the contents were somewhat difficult; three facilitators believed that audiences could understand 70% to 90% of the course materials, while the other three thought that audiences was able to understand only 50% to 70% of the course materials. The conclusions were based on the general perceptions of all modules conducted by a facilitator, while the perceived difficulty level would be different across modules. Program participants were asked to answer the same questions in the baseline survey and the results are consistent with the facilitators' perception. Moreover, the facilitators asserted that terminology and technical jargons, regulations, and calculations were the most difficult to understand. All the facilitators believed that the study materials were important and relevant to the participants' future financial decision-making. However, two facilitators pointed out that some topics may not be have an immediate relevance for the participants depending on their current life stage (Q9 and Q10). Survey questions also asked for the facilitator's opinions on study materials that most effectively helped them to reach their teaching objectives. As shown in Figure 1, the results revealed that practical examples and experience sharing were considered the most effective teaching methods by the facilitators. Due to push back from program participants in some modules (for instance, "Buying a Home within Your Means"), calculation-related practices were considered the least effective teaching method, which is consistent with the participants' feedback in the baseline survey.

As mentioned by the facilitators, some participating organizations prefer to learn financial concepts through games. Studies have provided clear evidence on the effectiveness of games-based learning (Sitzmann, 2011; Dobrescu et.al, 2015). The IFL is designing and planning to introduce more games to create a fun and light-hearted interactive learning environment.

The last two multiple-choice survey questions (Q12 and Q13) asked about the consultation, which takes place after the module has ended. Only two facilitators were involved in no more than three out-of-class consultations in the last six months. However, since the baseline survey reports rising demand for after-module consultation, IFL should provide online financial consultancy after attending the module to cater participants' need.

The last part of the facilitator interaction survey contained 11 self-reporting questions designed to assess facilitator behavior during class. This part is based on the Questionnaire on Teacher Interaction (Lourdusamy & Khine, 2001), which uses a Five Point Likert Scale. The survey results showed that facilitators were satisfied with their teaching methods and interactions with the participants. The baseline survey was conducted and cross-studied to understand participants and facilitators' different perceptions from the module, and study the participants' behavior before and after learning.

Figure 1: Voting Results for the Most Effective Teaching Methods



4.6 Other Surveys Conducted: 2). Pilot Survey and Data Collection

A pilot study³ was conducted to evaluate the planned statistical and analytical procedures, including testing the survey procedure and questionnaire. Another objective of the pilot

³ The pilot study is the pre-study of the baseline survey, a miniature version of the project. The pilot survey helps to identify some of the procedural bugs and permits preliminary evaluation of the program effectiveness. Moreover, the major task of the pilot survey was to compare the learning outcomes of voluntary group and compulsory group, conditional on participants' personal characteristics.

survey is to deal with the potential self-selection bias due to the presence of voluntary program participants. The questionnaire was field tested over a 10-day period in January 2016. The survey respondents are from nine randomly selected IFL modules. A total of 88 responses were gathered, with 22 of the respondents attended more than one module. The average response rate was 40.6% (110 out of 271 questionnaires distributed).

The pilot survey acquired direct feedback from respondents about the perceived difficulty of the questions and time-cost of answering the questionnaire, and enabled refinements to be made to the survey questionnaire.

At the beginning of each selected module, the surveyor distributed a hardcopy of the questionnaire and explained the purpose of the survey, method and other details. The completed forms were collected at the end of each class. The online survey link was also provided for those who preferred taking the online survey. However, only 2 of the 110 completed surveys were taken online; the rest were completed in class using the hardcopy.

Table 4 presents the survey date, location and response rate for each selected module. While class participants from the first six modules joined the financial literacy program voluntarily, the latter three modules were held at PSA Corporation Ltd., where employees are required to attend the financial literacy program and take the survey. Therefore, the 68 surveys out of 110 completed in the last three modules were part of a mandatory work activity.

Table 4: Pilot Survey Schedule and Respond Rates

Name of company	Type of session (Talk or Workshop)	Survey Date	Class Participants	Survey Participants	Response Rate
1 Singapore Customs	Talk (Building Your Nest Egg)	Thu, 14 Jan	35	7	20.0%
2 Council for Third Age	Talk (Understanding Basic Health Insurance)	Fri, 15 Jan	16	8	50.0%
Kia-Tencor 3 Singapore Pte Ltd	Workshop (Understanding Basic Health Insurance)	Fri, 15 Jan	40	3	7.5%
4 Tabernacle Of Christ	Workshop (Understanding Basic Health Insurance)	Sat, 16 Jan	50	16	32.0%
Singapore Civil 5 Defence Force	Workshop (Managing CPF Money For Your Retirement)	Thu, 21 Jan	30	6	20.0%
Singapore Civil 6 Defence Force	Workshop (Introduction to Estate Planning)	Thu, 21 Jan	30	2	6.7%
7 PSA Corporation Ltd	Talk (Making Sense Of Your Money)	Fri, 22 Jan	23	23	100.0%
8 PSA Corporation Ltd	Workshop (Are You Borrowing Too Much)	Fri, 22 Jan	23	22	95.7%
9 PSA Corporation Ltd	Talk (Understanding Basic Health Insurance)	Mon, 25 Jan	24	23	95.8%
Total			271	110	40.6%

The survey results were reported in progress report 2. Based on the results of the pilot survey and the feedback from the Financial Education Steering Committee, several amendments were made to the questionnaire. In particular, questions designed to get feedback on various aspects of the program were added to the survey. The pilot survey

results indicate that the differences in scores of attitude, confidence, and intention are statistically insignificant between the compulsory group and the voluntary group. Therefore, although it is possible that voluntary participants are self-selected into the study, self-selection bias is not a concern in this study.

5. Baseline Financial Literacy Survey and Data Collection

During the survey period of March to July 2016, 381 respondents completed the questionnaire, and a total of 629 survey questionnaires were collected⁴. At the beginning of each selected module, the surveyor distributed a hardcopy of the questionnaire and explained the purpose of the survey, method and other details. In addition, although the program was mandatory for most of the participants, the surveyor emphasized that participation in the survey is voluntary and that participants who choose to leave their contact information for the follow-up study will be contacted by email or phone. The completed questionnaires were collected at the end of each class.

Table 5: Survey Responses for Each Module

Module Name	Responses	Percent
Introduction To Personal Investing (Workshop)	147	23.37
Building Your Nest Egg (Workshop)	136	21.62
Understanding Loans and Credit (Talk/Workshop) ⁵	90	14.31
Financial Planning Begins Now (Workshop)	86	13.67
Do I Need Every Type Of Insurance? (Workshop) ⁶	50	7.79
Making Sense Of Your Money (Workshop)	49	7.79
Managing CPF Money For Your Retirement (Workshop)	43	6.84
Buying A Home Within Your Means (Workshop)	17	2.7
Introduction To Estate Planning (Workshop)	11	1.75
Total	629 ⁷	100

The IFL distributed two surveys before and after learning to evaluate program effectiveness and accumulated knowledge. Therefore, we mainly conducted post-learning surveys to

⁴ 381 respondents completed the questionnaire and 629 survey questionnaires were collected. Among the surveys collected, 169 respondents completed questionnaires for one module, and 176 respondents completed questionnaires for two modules; the remaining 36 respondents completed questionnaires for three modules.

⁵ “Understanding Loans and Credit (Workshop)” is offered to MHA as a talk, while for non-MHA participants, the module can be offered either as a talk or as a workshop. The baseline questionnaire for talk and workshop are the same for this module.

⁶ “Do I Need Every Type Of Insurance?” is a workshop that is offered only to MHA participants.

⁷ There were 381 participants who responded and provided 629 responses to survey questionnaires. 169 respondents completed questionnaires for one module, and 176 respondents completed questionnaires for two modules; the remaining 36 respondents completed questionnaires for three modules.

assess the changes in financial behavior and the relationship between financial knowledge and financial behavior. More specifically, we surveyed respondents immediately after classes and three months after classes in order to identify any changes in their financial knowledge and behaviors. In addition, to study the extent to which the participants' knowledge increased after the learning, we collected 34 copies of control group surveys to compare their knowledge before and after the financial literacy classes. The control group were randomly selected from the compulsory program participants, and invited to take the survey before attending any financial education modules. The control group attended financial workshops after they completed the survey they did not receive financial education at the time of taking survey. Propensity score matching technique selects the most similar pairs in the treatment and control group for comparison and thus personal characteristics of the individuals in the control group are similar to those in the treatment group.

For the follow-up survey, we sent an email or text message with a web link of the corresponding online questionnaire to 245 participants (out of the original 381 participants) who had left their contact information for the follow-up survey. We also sent an additional email or text message to remind those participants to complete the online survey. The response rate as of July 25, 2016, for the follow-up survey is relatively low at around 10%. The relatively small number of responses in the follow-up survey does not guarantee the statistical significance, but we find the knowledge increments are economically significant⁸.

Nine popular modules (as shown in Table 5) were selected for evaluation, and the majority of the surveys were collected from modules on investing, estate planning, debt management and financial planning. The average response rate of the baseline survey is 73%.

Table 5 presents the number of responses for each module surveyed. Similar to the results from the pilot survey, the responses rate for compulsory modules participants are higher than voluntary module participants. The variation of the number of responses across different modules depends on the frequency that a module being conducted and surveyed, whether participants attend a module voluntarily, and the encouragement from the facilitator, which could raise the awareness of the participants and make participants more comfortable to respond to the survey. Therefore, the response rate does not reflect participants' comfort level in responding to a survey for a particular topic. Many mandatory program participants attended up to four modules. Although 56% survey participants answered more than one questionnaire, they do not have a heavier weight on the study and the analysis gives an equal weight for each program participant.

To identify and reduce selection biasness, the survey includes a question to distinguish participants who attend the program voluntarily from those who participate to satisfy a

⁸Statistical significance looks at **t-tests** or **p-values** to determine whether or not to reject the null hypothesis at a certain level of significance, while economical significance looks at the **magnitude** and the **sign** of the estimated coefficient.

work requirement. 35 out of the 110 survey respondents indicated that it was compulsory for them to attend the program.

6. Description Statistics and Survey Result Analysis

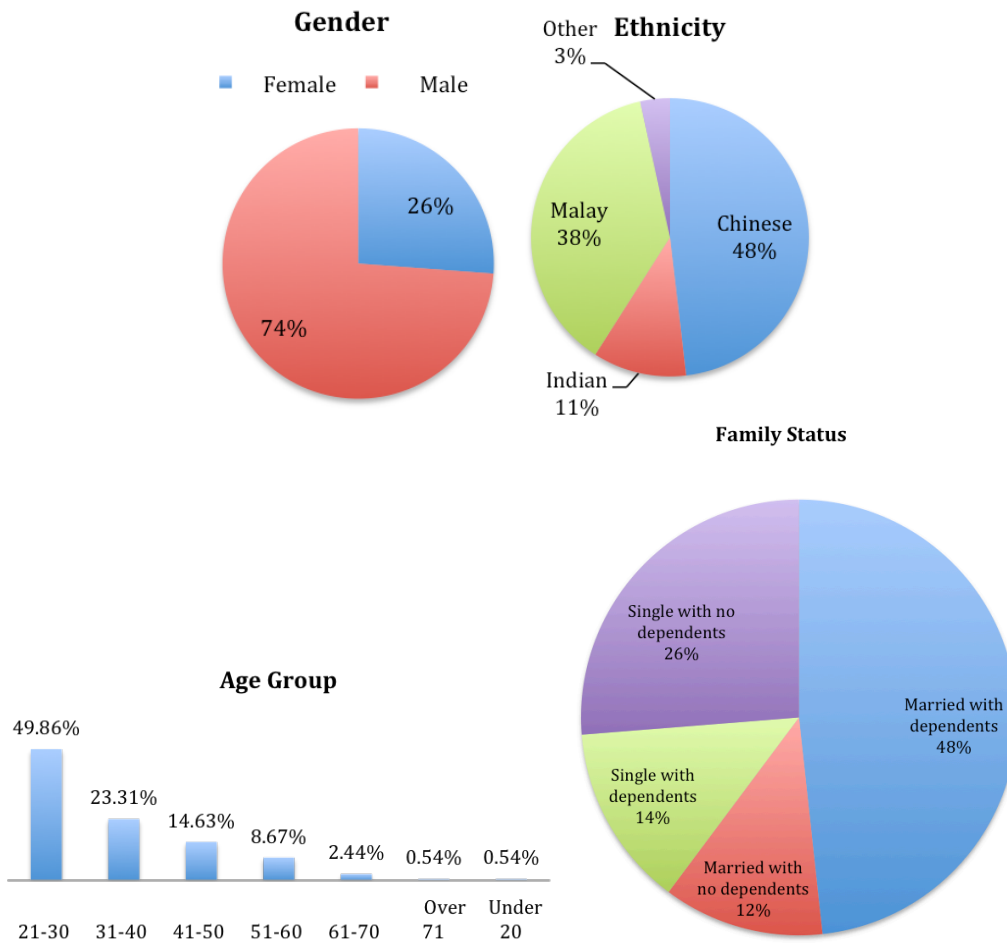
6.1 Part 1: Biography

- **Basic Demographic Information**

Part 1 of the survey consists of questions about the respondents' annual income, employment status, education level, housing situation, and personal and family circumstances. The basic biographic information is presented in Figure 2. Chinese, Malay and Indian respondents make up 48%, 38% and 11% of the sample, respectively. The remaining 3% of the sample is made up of Arab descents, Javanese, Boyanese, Buginese and Sikh respondents. Three respondents did not report their gender, and 74% of the sample is made up of male respondents. Moreover, approximately half of the survey participants are individuals between the ages of 21 and 30, who have just started their career or are in a junior position at work; their main concern is basic financial planning and debt management. Around 38% of the sample is individuals between the ages of 31 and 50, whose major concerns are insurance and financial investment. 12% of the sample is individuals over the age of 51, who have started to consider their retirement plan and estate planning.

Since most of the survey respondents are employees from the public sector, 96% of the respondents are Singapore citizens. As shown in the following figures, the personal characteristics of the public sector respondents vary significantly, creating enough heterogeneity and variation in the sample, so findings can be extrapolated to the general public. Although around 50% of the respondents are below the age of 30, 60% of the sample is married, and only 26% is single without dependents. With regard to religion, 45.7% of the respondents believe in Islam, and 18.28% are Buddhist.

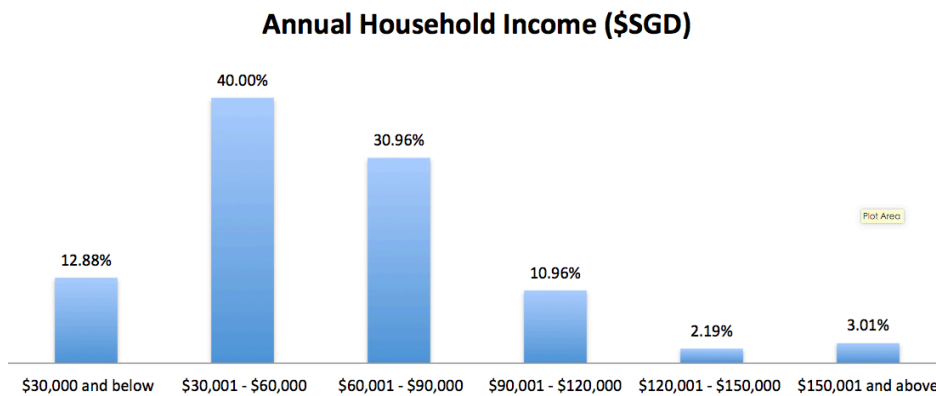
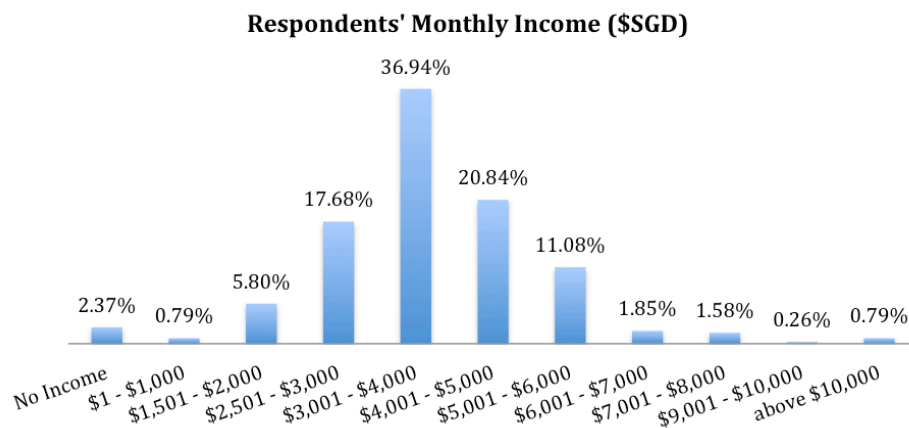
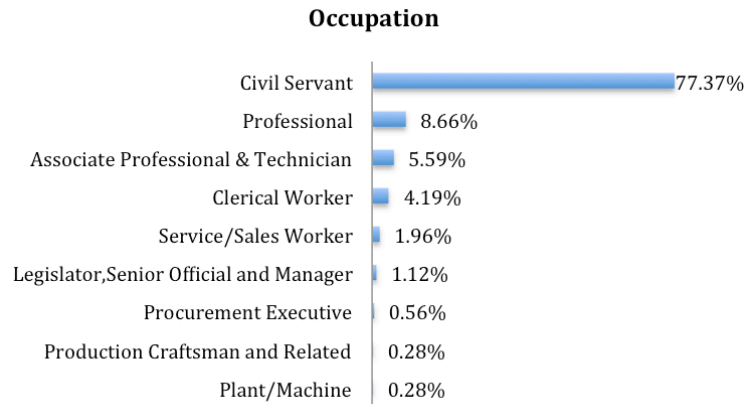
Figure 2: Demographics of Respondents



- **Income and Employment Status**

The first section of the survey also collects information on the respondents' employment status. Civil servants make up approximately 77.37% of the survey participants and represent the absolute majority. The second largest occupational group consists of professionals, who represent 8.66% of the survey participants, followed by associate professionals and technicians, who account for 5.59% of the sample, clerical workers, who account for 4.19% of the sample, service and sales workers, who account for 1.96% of the sample, and legislators and senior officials, who account for 1.12% of the sample. Less than 1% of the survey participants are made up of procurement executives (0.56%), production craftsmen and related workers (0.28%), and plant and machine workers (0.28%). The majority of the respondents (75.46%) earn a monthly income that ranges from \$2501 to \$5000, and approximately 71% of survey participants have an annual household income ranging from \$30,001 to \$90,000.

Figure 3: Occupation & Income

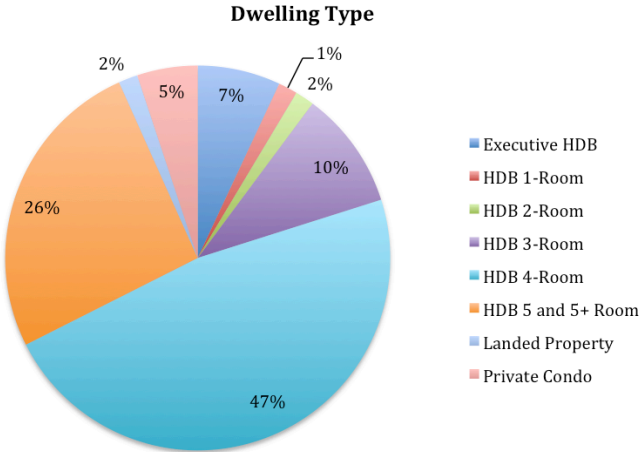
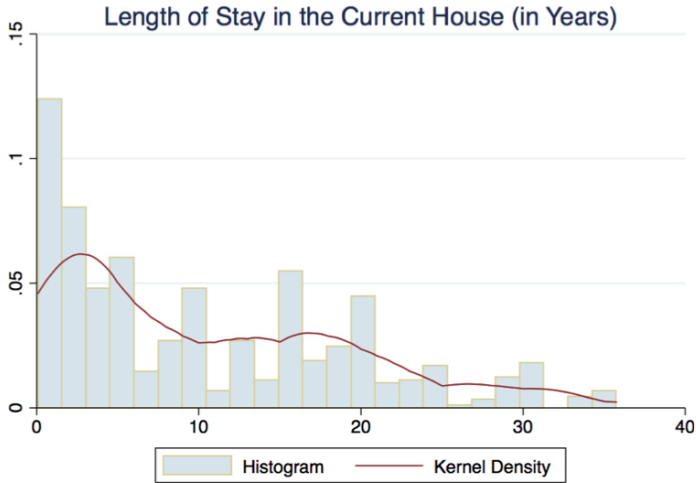


- **Housing**

96% of the survey participants reported their length of stay in the current residences, which varies from one month to around 36 years, with an average length of 10.3 years. It is worth mentioning that 58% of the survey participants own their property, and a 36% of the participants live with their parents. 5% of the participants rent their home, and only 1% live in staff housing.

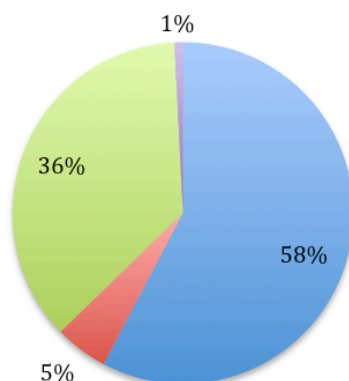
47% of the respondents live in a four-bedroom HDB flat. 26% live in a five-bedroom or larger HDB flat, and 10% live in a three-bedroom HDB flat. The remaining participants live in a one-bedroom HDB flat, two-bedroom HDB flat, landed property, private condominium or executive HDB flat.

Figure 4: Housing



Tenancy Status

■ Own ■ Rent ■ Staying with Parents ■ Satff House



- **Education**

Based on their English proficiency, the survey participants were divided into two groups: English as their first language (group 1) and English as their second language (group 2). The results from both groups are extremely similar; a two group T-test indicates there is no statistical difference on total knowledge scores (including both basic and module specific questions). 55.85% of group 1 and 54.72% of group 2 were rated “good” in their English proficiency, and 25.28% of group 1 and 26.42% of group 2 were rated “average”. However, 18.11% of group 1 was self-rated “excellent” in their English proficiency, compared to only 8.49% of group 2. However, T-test results indicate that language proficiency does not contribute to the differences in learning outcomes.

The fact that educational attainment bears great diversity can be seen in that over 35% of the participants received a polytechnic diploma and approximately 20% received a bachelor’s degree. It is noted that individuals with an O-level or N-level qualification or certification from the Institute of Technical Education represent a large portion of the respondents (approximately 34%).

Figure 5: Education

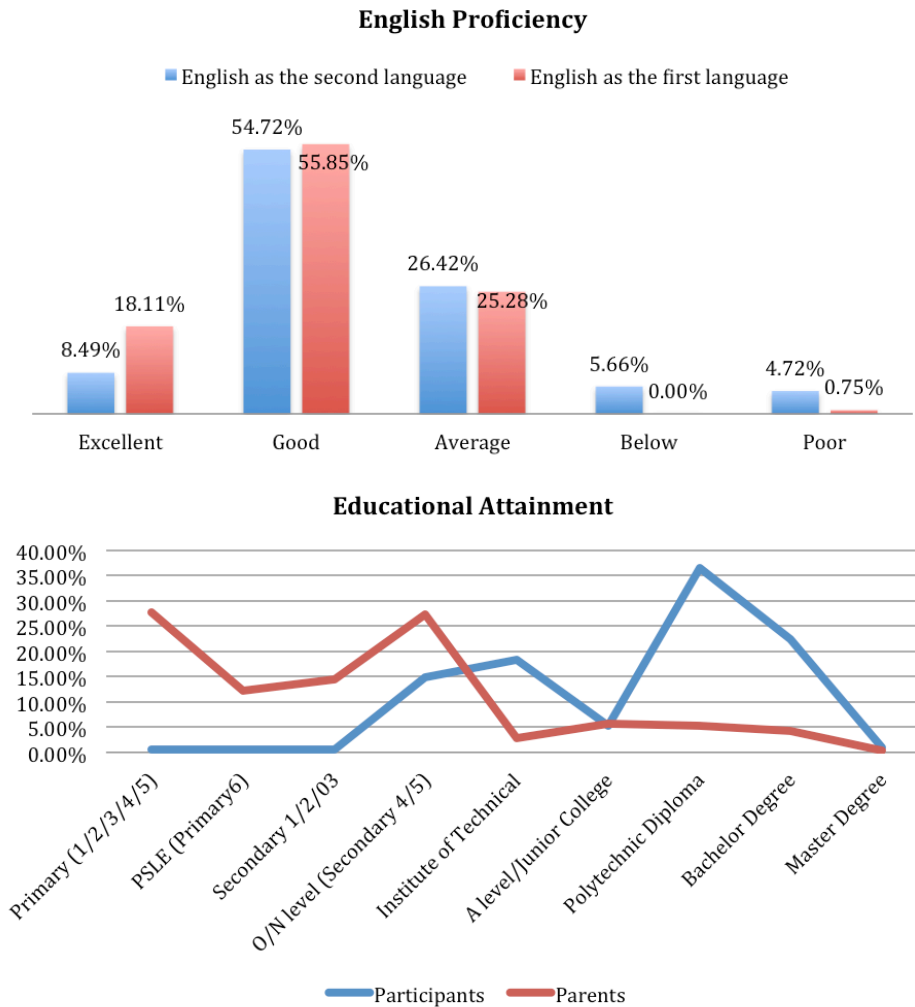
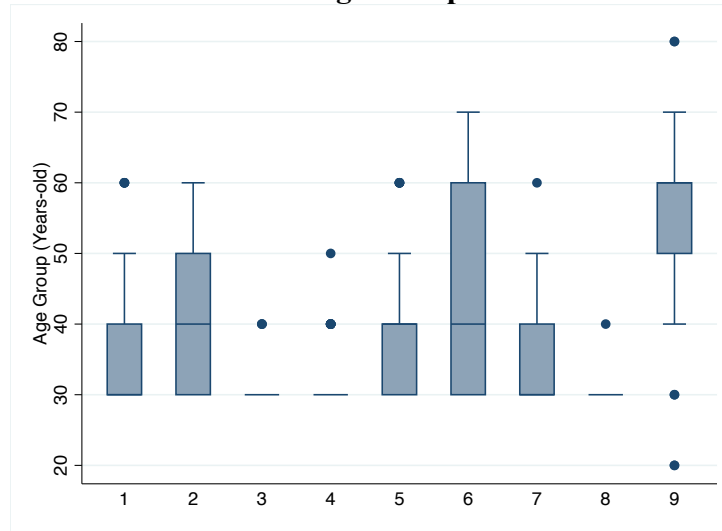
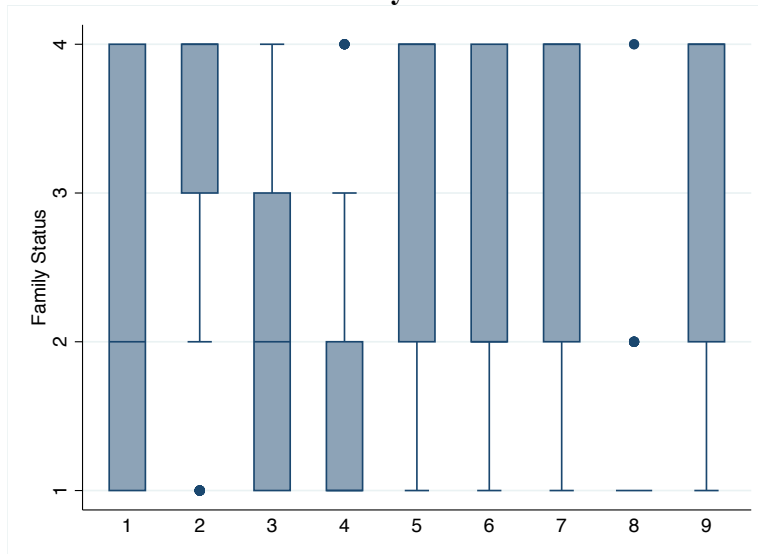


Figure 6 examines demographic data, such as age, income, ethnicity, and family and tenancy status, for each module. Graph a to f presents the box-plot distribution of the respondents and numbers on X-axes are the indicators of modules (see footnote 10). Outliers are plotted as individual points and can be observed in most of the modules. Moreover, the results indicate that some participants may not attend the suitable workshop based on the current life stage. For instance, as shown in the graph a, a few number of participants below age 30 attended the retirement workshop; The average age of the estate planning workshop attendants is around 40, which is relatively younger than the program target; Personal investment workshop should have target more mid-age consumers (age 40-50), who have more financial freedom for investment. Therefore, the financial literacy workshop should minimize the outliers by grouping participants with a similar background or personal characteristics, and the program should suit participants' need, especially the compulsory participants whose modules are assigned by employers.

Figure 6: Demographics of Respondents Across Modules⁹
a. Age Group



b. Family Status

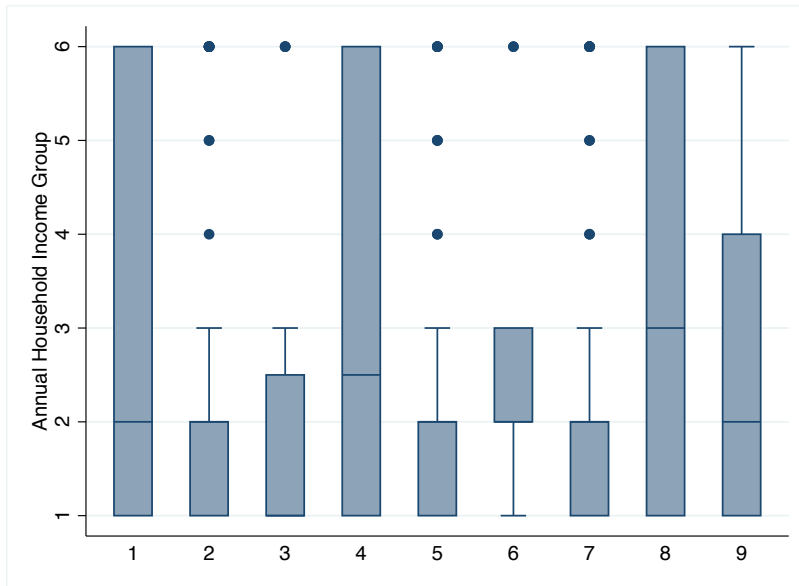


Notes: Family status 1: Single with no dependents; Family status 2: Single with dependents;
 Family status 3: Married with no dependents; Family status 4: Married with dependents.

⁹ X-axis shows modules codes:

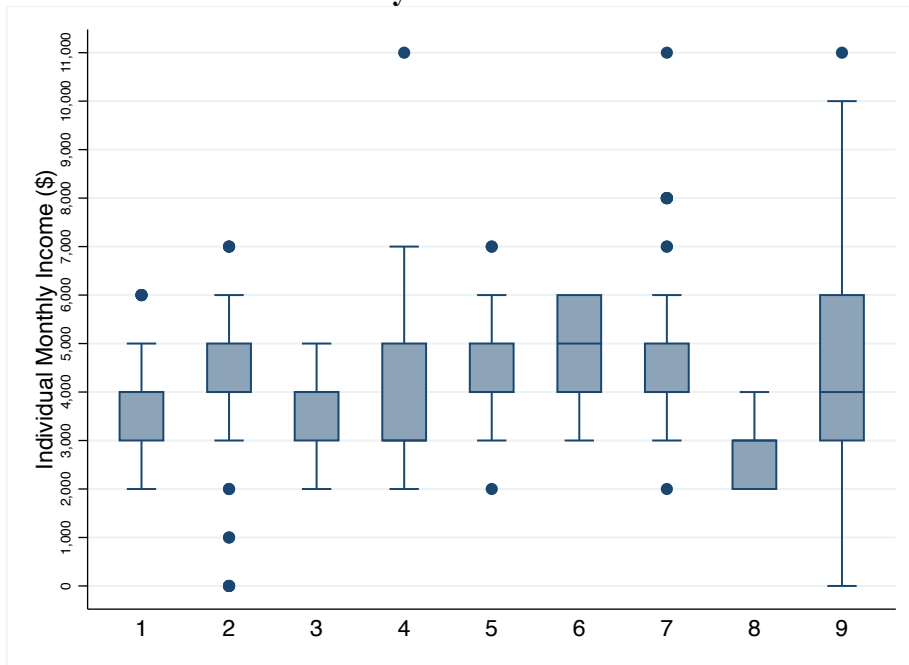
- 1: Understanding Loans and Credit
- 2: Building Your Nest Egg
- 3: Buying A Home Within Your Means
- 4: Do I Need Every Type Of Insurance?
- 5: Financial Planning Begins Now
- 6: Introduction To Estate Planning
- 7: Introduction To Personal Investing
- 8: Making Sense Of Your Money
- 9: Managing CPF Money For Your Retirement

c. Annual Household Income

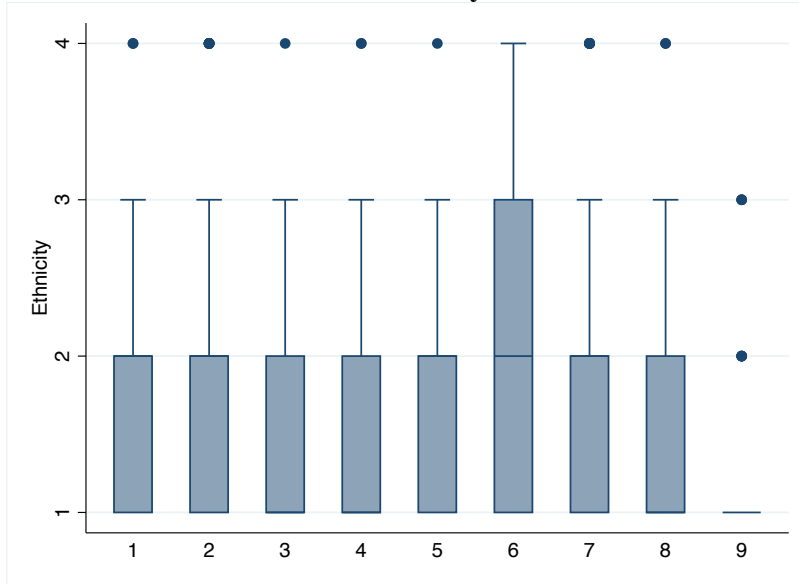


Notes: Family income 1: \$30,000 and below; Family income 2: \$30,001 - \$60,000
 Family income 3: \$60,001 - \$90,000; Family income 4: \$90,001 - \$120,000;
 Family income 5: \$120,001 - \$150,000; Family income 6: \$150,001 and above.

d. Monthly Individual Income

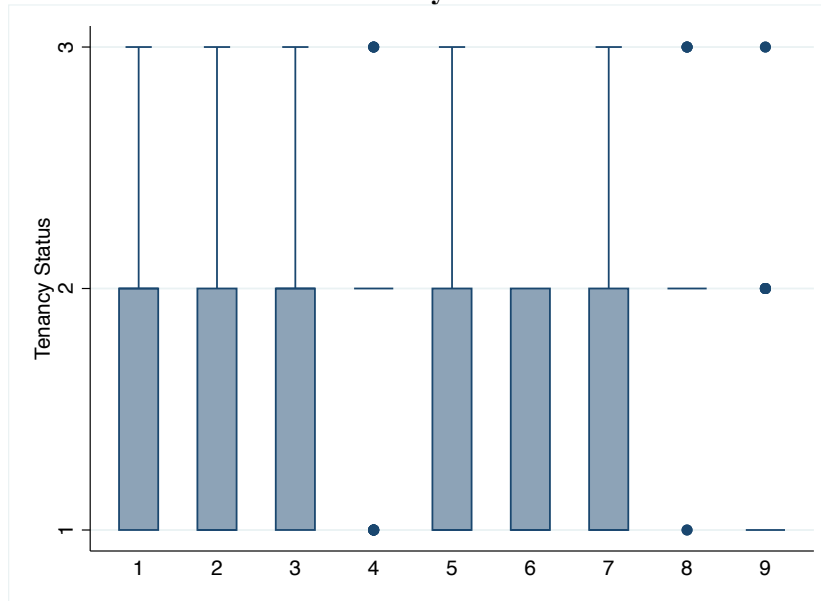


e. Ethnicity



Notes: Ethnicity 1: Chinese; Ethnicity 2: Malay;
Ethnicity 3: Indian; Ethnicity 4: Other.

f. Tenancy Status

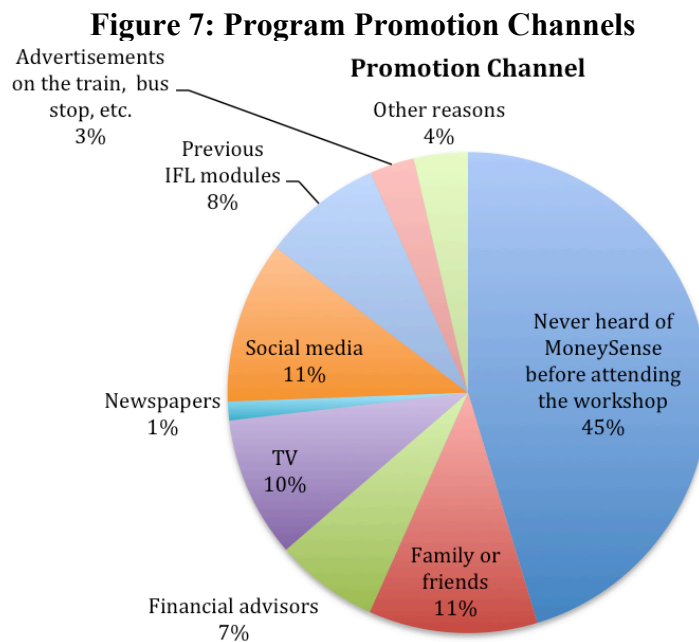


Notes: Tenancy status 1: Own;
Tenancy status 2: Stay with parents/grandparents;
Tenancy status 3: Rent/Staff house.

6.2 Part 2: Program Evaluation – Participant Satisfaction and Feedback

Part 2 is a set of statements requesting respondents to indicate their satisfaction level and provide feedback on the program. In addition to the questions about the contents and effectiveness of the module, the questionnaire asks respondents whether their participation in the module was compulsory and why they decided to participate in the survey, thereby identifying the volunteers in the sample and highlighting the extent to which volunteer bias could have reduced the external validity of the findings. The results in the baseline survey are consistent with the results in the pilot survey. The variance-comparison tests and the two-sample T-tests with equal variances indicate that there is no evidence that the compulsory group and the voluntary group are statistically different.

A few questions are designed to study how well the participants understood the course material. As, shown in Table 6, 72.1% of the participants reportedly found the difficulty level of the course material to be adequate. A smaller percentage found the material somewhat easy. When asked how much of the study material they understood, 50.1% of the survey participants stated that they understood almost all of the material, and 33.1% stated that they understood about half of the material. Only 1.9% of the participants understood less than a third of the course material, which is a positive feedback to note. Finally, 60% of the participants believe that the questionnaire is relevant to the course material, and 38% find it very relevant.



When the participants were asked for their motivations for participating in the survey, 41% reported a desire to contribute to the research. 22% of the respondents thought that participation in the survey is mandatory although the surveyor emphasized that participation in the survey is voluntary at the beginning of the module. 19% participated because the survey consists of only a few questions, which require little effort to answer. 10%

participated because the subject of the survey interests them.

Given that social media is one of the most powerful promotional channels today, it is surprising to find that only 11% of the participants discovered *MoneySense* through social media. 11% of the participants learnt of *MoneySense* through family or friends, and 45% first heard of *MoneySense* at one of the workshops. Only 10% of the participants saw an advertisement for *MoneySense* on television. 8% of the participants knew about *MoneySense* because they had participated in previous IFL modules, and 7% was informed about the program by their financial advisor.

Around 8% respondents claim that they can understand all study material, and around 50% can understand almost all of it. Based on the survey results shown in Panel B of Table 6, only 9% of them fail to understand one-third or less of the study material. In Panel A of Table 6, 8% of respondents find the study material to be difficult. Therefore, survey results from Table 6 are consistent, and the difficulty level of the study material is adequate. Moreover, “Building your nest egg”, “Do I need every type of insurance?” and “Introduction to personal investing” were three modules that the respondents found difficult were also the ones they understand almost all of, which means the delivery of the course contents were successful.

A simple OSL binary regression was used to assess whether the difficulty level affects the module-specific knowledge score (score ranges 0 - 100). After controlling for the module fixed effect (unobservable differences among modules), we find a strong negative relationship between material difficulty level and the knowledge score. More specifically, for the same module, the knowledge score is highest when a participant perceived the content to be “very easy”. The knowledge scores decrease significantly when the perceived difficulty level further increases. For instance, the knowledge score is 38.3 lower on average if a participant rates the module as “very difficult”, compared to a rating of “very easy”.

Figure 8 shows the responses to questions exploring other channels for financial advice. 36.6% of the respondents claim that they do not need additional financial advice after workshops, indicating participants may be resistant to potential hard sell. The rest 63.4% of respondents present the willingness of receiving additional financial advice through other channels. Although participants can contact IFL in person, by email and phone after attending modules, 26.3% of participants in the following open-ended question demand more assistance in establishing contact with trainers to get financial advice. The survey respondents would least prefer to receive financial advice in person, by mail, via online chat and by phone. The survey results suggest although many participants seek financial advice after attending the program, most of them do not want to consult with trainers in person if they have any questions in the future. Emails and website consultation were rated as the most acceptable channels: 30.8% would like to receive financial advice through email, and 17.2% would prefer to get financial advice from the *MoneySense* website. In-

class observations find that many participants sought financial advice after the workshop ended. Therefore, it would be necessary for ILF to establish online portal, mobile apps, and email consultation for the post-module financial consultancy. In addition, IFL may consider provide extra time for individual financial advice right after the workshop ended.

Table 6: Assessment of the Course Material

Panel A: Difficulty

Difficulty (How difficult or easy do you find the study material?)	Very easy	Somewhat easy	Adequate	Somewhat difficult	Very difficult
Understanding Loans and Credit (Workshop)	4.4%	6.7%	82.2%	5.6%	1.1%
Building Your Nest Egg (Workshop)	2.2%	16.2%	70.6%	11.0%	0.0%
Buying A Home Within Your Means (Workshop)	0.0%	23.5%	70.6%	5.9%	0.0%
Do I Need Every Type Of Insurance? (Workshop)	2.0%	10.0%	78.0%	8.0%	2.0%
Financial Planning Begins Now (Workshop)	5.8%	22.1%	70.9%	1.2%	0.0%
Introduction To Estate Planning (Workshop)	0.0%	27.3%	63.6%	9.1%	0.0%
Introduction To Personal Investing (Workshop)	4.1%	16.3%	70.7%	6.8%	2.0%
Making Sense Of Your Money (Workshop)	6.1%	22.4%	65.3%	4.1%	2.0%
Managing CPF Money For Your Retirement (Workshop)	2.3%	20.9%	65.1%	11.6%	0.0%
Total	3.7%	16.3%	72.1%	7.0%	1.0%

Panel B: Understanding

Understanding (How much of the study material did you understand?)	Less than one third of it	About one third of it	About half of it	Almost all of it	All of it
Understanding Loans and Credit (Workshop)	4.9%	12.2%	26.8%	36.6%	19.5%
Building Your Nest Egg (Workshop)	0.0%	5.3%	33.1%	56.4%	5.3%
Buying A Home Within Your Means (Workshop)	0.0%	11.8%	35.3%	47.1%	5.9%
Do I Need Every Type Of Insurance? (Workshop)	4.5%	9.1%	18.2%	59.1%	9.1%
Financial Planning Begins Now (Workshop)	1.2%	7.1%	34.1%	49.4%	8.2%
Introduction To Estate Planning (Workshop)	9.1%	18.2%	36.4%	18.2%	18.2%
Introduction To Personal Investing (Workshop)	0.7%	7.0%	37.1%	50.3%	4.9%
Making Sense Of Your Money (Workshop)	4.7%	7.0%	23.3%	51.2%	14.0%
Managing CPF Money For Your Retirement (Workshop)	4.8%	2.4%	40.5%	47.6%	4.8%
Total	1.9%	7.1%	33.1%	50.1%	7.8%

As shown in Figure 9¹⁰, 26.3% of the responses suggest that lengthening the duration of each class would be an improvement to the workshops. MHA participants attend four workshops during a two-day training. Therefore many of them felt the classes were very intense and demanded shorter course duration. However, participants who attend a single workshop or talk did not complain about the length of the module. The same percentage of participants would like to see more assistance with regard to contacting educators for financial advice after the workshops. As shown in Table 7, a better selection of module topics was suggested by 19% of the respondents (78 respondents). This feedback was clustered in four compulsory modules that assigned to MHA officers, possibly due to a lack of freedom to choose modules or unhappiness about the trainers, hence should not concern IFL to change the module topics. 97% respondents believed that the instructors were effective in teaching, and the survey results are presented as Figure 10.

¹⁰ Some other qualitative comments given by participants are:

-1). *Study Material:*

Bigger font for study material, more in depth in content, more informative videos

-2). *Class:*

Provide better interaction between participants with (should it be “with” or “in” case studies;

Questions by other participants best left to the end of the session;

More advice on debt management;

Some minor points don’t drag too long;

Difficult to concentrate;

Share and advice on how can we better spend/control extra cash on hand;

Probably show us some real cases in which people do not plan well and what happened to them;

Allow some time for group discussion;

Give more case studies via videos;

-3). *Post learning:*

Provide reminder and regular refresher talk; Yearly review;

Personal/individual advice;

Follow-ups and guidance;

Feedback after a few months on changes to financial planning and advices on improvements

-4). *Mobile Apps:*

Provide study material in soft copy or smart phone apps,

Provide budgeting apps, cash flow statement generating app, apps to alert overspending, expenses tracking apps

Introduce of accessible financial websites or apps

Provide more interactive online presence for younger generation

-5). *Other:*

Food seems tasteless

Table 7: Percentage of Respondents Demanded Better Selection of Topics

Module Name	Satisfaction Rate
Making Sense Of Your Money (Workshop)	20.41%
Introduction To Estate Planning (Workshop)	18.18%
Buying A Home Within Your Means (Workshop)	17.65%
Building Your Next Egg (Workshop)	16.18%
Introduction To Personal Investing (Workshop)	14.29%
Financial Planning Begins Now (Workshop)	12.79%
Managing CPF Money For Your Retirement (Workshop)	11.63%
Understanding Loans and Credit (Workshop)	4.44%
Do I Need Every Type Of Insurance? (Workshop)	0%

Figure 8: Willingness to Receive Financial Advices Through other Channels

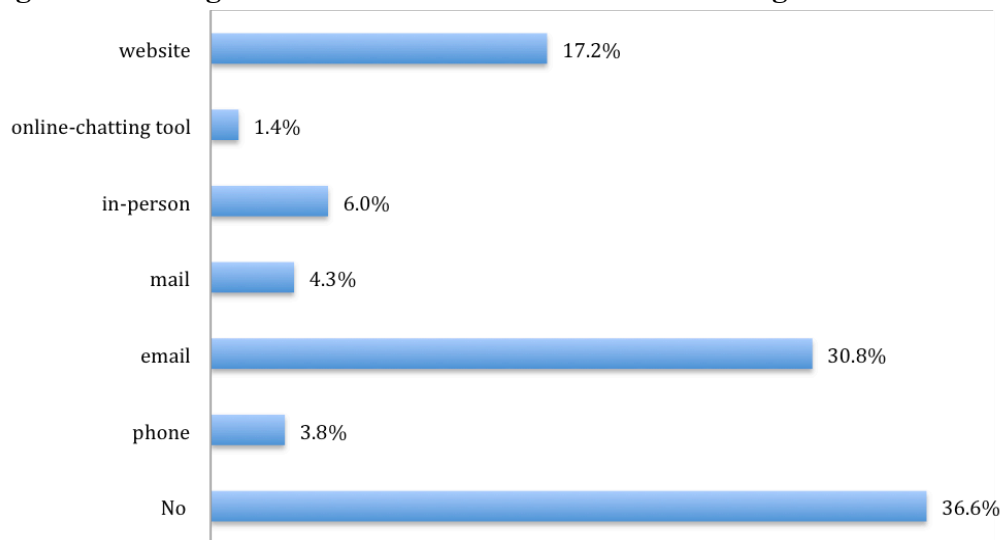


Figure 9: Suggested Improvements

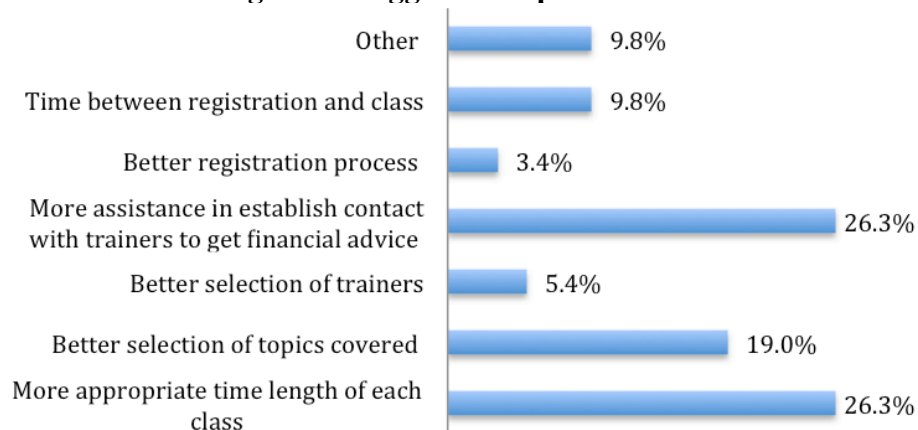
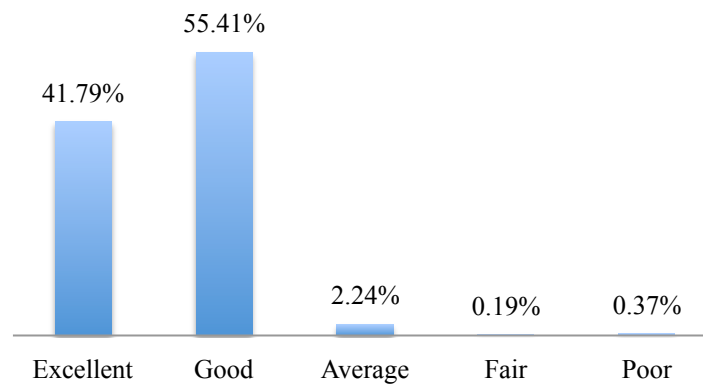


Figure 10: Instructor's Effectiveness



6.3 Part 3: Financial Literacy Evaluation Findings

- **Basic Financial Literacy Questions**

Part 3 of the survey is made up of two sections: basic financial literacy questions and module-specific questions. Part 3 begins by asking respondents to rate their personal financial knowledge on a seven-point scale, with 4 corresponding to the average level. Their responses help us to identify any differences between the respondents' perceived knowledge and actual knowledge (Lusardi and Mitchell, 2011).

Studies find that overconfidence is associated with individuals' perception of their financial capability and detrimental financial behaviors. For instance, overconfident investors trade in high volumes but earn lower returns (Oden, 1999; Barber and Oden, 2000; Statman et al., 2006). Overconfidence also affects the likelihood of seeking financial advice. Porto and Xiao (2016) asserts that the overconfident respondents are less likely to seek financial advice related to saving and, but more likely to require for advice in debt counseling and tax planning.

Table 8 presents an estimation of overconfidence. A respondent's self-assessment is correct if the self-assessed score is consistent with the basic knowledge assessment score. Based on the comparison between the scores obtained from the basic financial literacy questions and the self-assessed knowledge level, around 44.4% of the respondents correctly assessed their financial knowledge. More specifically, 38.2% of the respondents rated their financial literacy level as above average and scored above average; only 6.2% rated their financial literacy level as below average and also scored below the sample average. At the same time, 17.6% of the respondents rated their financial literacy level as above average but scored equal to or below the sample average. 26.1% of the respondents are underconfident in their financial knowledge (highlighted in red), and 17.6% of the respondents are overconfident (highlighted in blue).

The survey results from the 2012 National Financial Capability Study by the Financial Industry Regulatory Authority (FINRA) in the United States show that 11.6% of the respondents of the sample are overconfident about their financial capability, while around 33.8% of respondents are underconfident. Therefore, there are more overconfident consumers and less underconfident respondents in Singapore than the consumers in the U.S. in the two groups. Our study shows that, 55.8% of the overconfident respondents are between age 21 to 30, and male accounts for 77.1% of the overconfident sample. Respondents with polytechnic and technical education diploma account for 36.4% and 28.8% of the overconfident sample, respectively. IFL can implement a targeting approach by conducting a short knowledge quiz during the registration process, then group the overconfident, underconfident, and competent participants to different workshops, to comprehend each group's intrinsic valuation of advice.

The results indicate that mismatches between perceived and actual knowledge exist in the sample. Financial decisions are determined by an individual's financial literacy and overconfidence in financial knowledge. Individuals with both high knowledge and confidence are more likely to make better financial decisions than those with both low knowledge and confidences. The financial education program should put more efforts in educating those with perceived and actual knowledge mismatch. Overconfident individuals (high confidence, low knowledge) are more likely to engage in risky financial behaviors, leading to suboptimal financial decisions. Underconfident consumers usually lack exposure to various financial products and experiences in making financial decisions. Moreover, there are much fewer mismatches in our survey results than in those of the study by Lusardi and Mitchell (2011), who found that approximately 70% of the respondents are overconfident in their financial knowledge.

As can be seen in Table 9, five questions were used to measure the respondents' level of basic financial literacy. Lusardi and Mitchell (2007a, 2007b) designed the first three questions, and Van Rooij et al. (2011) designed the other two questions. These questions help us to study the respondents' understanding of compounding interest rate, inflation, risk diversification, time value of money and money illusion. Researchers find that consumers with higher math test scores are substantially less likely to make a financial mistake (Agarwal et al., 2010). The average financial literacy score of all the program participants is 2.91 out of 5.

Table 8: Assessment of Financial Literacy

Overconfident?		Basic Knowledge Evaluation		
		Equal or Below Average	Above Average	Total
Self Evaluation	Below Average	6.2%	9.4%	15.6%
	Equal to Average	11.9%	16.7%	28.6%
	Above Average	17.6%	38.2%	55.8%
	Total	35.8%	64.2%	100.0%

Table 9: Accuracy Rate of Basic Financial Literacy Questions

Basic Financial Literacy Questions	Missing	Do not Know	Refuse to Answer	Right	Wrong
Q1 Interest Rate	3.67%	3.41%	3.15%	81.36%	8.40%
Q2 Inflation	3.41%	11.55%	3.67%	60.37%	21.00%
Q3 Risk Diversification	4.46%	37.01%	3.41%	49.61%	5.51%
Q4 Time value of money	3.94%	9.19%	18.11%	48.82%	19.95%
Q5 Money Illusion	3.94%	7.35%	3.67%	55.12%	29.92%

While 81.36% of the sample correctly answered the interest rate question, and 60.37% correctly answered the inflation question, less than 50% of the sample correctly answered the risk diversification and time value of money questions. Furthermore, 37% of the respondents reported that they did not know the answer to the risk diversification question, and approximately 12% reported that they did not know the answer to the inflation question. Since “do not know” answers tend to be given by respondents with a very low level of financial literacy (Lusardi and Mitchell 2006, 2007a), the high number of “do not know” responses (37% answered “do not know” in the risk diversification question) in this study is a concern. In addition, the low number of correct responses, particularly to the inflation and risk diversification questions, shows that many of the respondents lack basic financial knowledge. Table 10 shows the survey results of the U.S. National Financial Capability study in 2012. The accuracy rates for question 1 and 2 are higher in the U.S. study. In addition, 46% of the respondents answered two questions correctly, 30% answered three questions correctly, and 10% of them are able to answer all five questions correctly (Lusardi, 2010).

Table 10: FINRA 2012 National Financial Capability Study in the U.S. (n=25,509)

Basic Financial Literacy Questions	Do not Know	Right	Wrong
Q1 Interest Rate	10.8%	76.9%	12.2%
Q2 Inflation	20.15%	64.1%	15.75%
Q3 Risk Diversification	41.3%	51.2%	7.5%
Q4 Bond question *	38.2%	29.4%	32.4%
Q5 Mortgage question *	14.1%	77.6%	8.3%

Figure 11 shows that only 16.1% of the respondents correctly answered all five questions; approximately 63.3% correctly answered at least three questions, and 8.4% incorrectly answered all the questions. Thus, compared to the U.S. survey results, our findings show that although the level of basic financial literacy knowledge in the current study is slightly higher than the U.S. results, the lack of financial knowledge is still widespread among the program participants, indicating the need to provide a program for basic financial education to the general public in Singapore. Moreover, the program should aim to provide information on basic financial concepts, such as risk diversification, inflation and time value of money, before educating participants about more complex financial topics.

The study reveals significant differences in socio-demographic, family and peer characteristics among the survey participants. Table 11 shows the differences in means between the subgroups of the sample and the significance of those differences. The difference in level of financial literacy between the male and female respondents is statistically significant. On average, male respondents scored 0.395 (with a full score equals to 5) less than female respondents when answering the module specific knowledge questions. Table 11 also shows a significant difference in confidence level on making financial decisions. Male respondents were more confident than female respondents on making related decisions. Similarly, Participants who have college degree received higher scores than others.

Figure 11: Basic Financial Literacy Questions

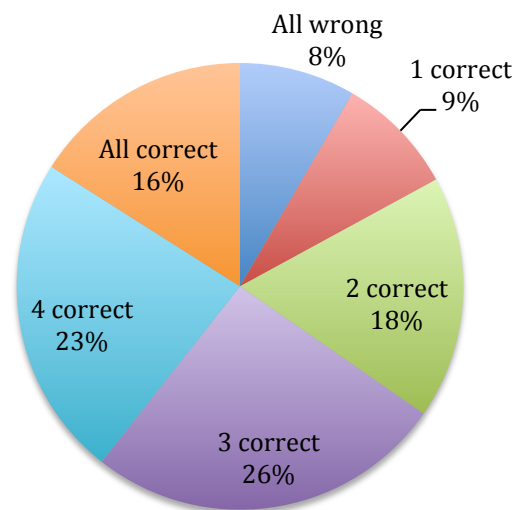


Table 11: Two-sample T test with equal variances, by gender

Two-sample T test with equal variances, by gender					
Variables	G1(Female)	Mean1	G2(Male)	Mean2	Mean Differences
Self-assessed Knowledge	74	78.1	218	90.74	-12.64***
Basic Knowledge	99	54.588	279	59.515	-4.927*
Specific Knowledge	99	59.647	279	52.159	7.488***
Attitude	99	67.324	279	66.267	1.057
Confidence	99	47.529	279	58.216	-10.686***
Intention	99	64.706	279	64.262	0.444

Fernandes, Lynch and Netemeyer (2014) found that financial literacy interventions had smaller effects on behavior in low-income samples than in general population samples. Table 12 studies the learning outcomes and behavioral assessment across different individual income segments. The results clearly show that low-income respondents' (monthly income below \$2000) performances are significantly lower than the sample

average. As a side note, the learning outcomes for the respondents in the highest income bracket are also less than average, mainly due to the sampling issue (only eight observations). The results are consistent with the findings in the related literature that the financial behavior of the low-income sample is arguably more controlled by circumstances independent of intention (Bertrand et al. 2006). Many studies have shown that financial education is an effective means of intervention in low-income people (Anderson, Zahn, and Scott, 2004; Reich and Berman, 2015; Lyons, Chang, et al., 2006), the financial education is marginal effective with each additional hour of education up to 12 hours. Therefore, the impact of financial literacy education has the least impact on the low-income population.

Table 12: Assessment Outcomes by Income Segment

Income Group	Full Sample	0 - 2000	2000 - 5000	5000 - 8000	Above 8000
Sample size	629	60	479	82	8
Basic Knowledge	58.3	46.0	57.1	73.9	60.0
Module specific knowledge	54.0	47.7	53.8	60.7	45.0
Attitude	66.6	56.1	67.0	72.6	61.3
Confidence	41.7	40.2	41.7	42.9	37.5
Intention	64.4	61.8	64.8	66.2	43.8
Habit	18.1	13.7	18.3	20.6	13.3
Sophistication	3.6	2.1	3.6	4.4	3.6

- **Module Specific Financial Literacy Questions**

In addition to the five questions about basic financial concepts, the respondents were asked to answer a set of module-specific questions. These questions were adopted from the evaluation survey used by the IFL. We surveyed participants from 9 modules on different topics across a range of decisions, allowing for a comprehensive analysis of the effects of financial education on every aspect of life.

While Table 13 presents the results of basic financial literacy questions by module, Table 14 summarizes the mean, standard deviation, and score range of each module. A low standard deviation indicates that the observations are close to the mean of the set, while a high standard deviation indicates that the scores are spread out over a wider range of values. The scores of learning outcomes (knowledge, attitude, confidence, and intention) are scaled into the same range, allowing for comparison across modules. Panel A-D in Table 14 shows the average scores of program-specific knowledge after participation, intention, confidence and attitudes, respectively. It worth noting that sample size of the respondents for *Buying a Home Within your Means* is 17 and *Introduction to Estate Planning* is 11, the average score might not be very reliable although the samples respondents were randomly chosen.

Panel A presents the financial knowledge obtained from each module. The module specific knowledge is described by total score ranging from 0 to 100, and each question is assigned to 20 score. The max score in the module *Buying a Home within Your Means* is 80, which means that none of the participants in the module got full score on all five questions. The total number of surveys from nine modules amounts to 629 and the average score for the all is around 54 points with a standard deviation of 29.2. As shown in Panel A, participants perform relatively better in 2nd, 6th, 7th and 9th modules by scoring higher than 3, on average. Specifically, the 9th module (*Managing CPF Money For Your Retirement*) scores 70.23 in average, which is the highest, then followed by that in 6th, 2nd and 7th modules. In the rest 5 modules, participants perform relatively worse with the average score lower than 3. In particular, participants in the 3rd module (*Buying A Home Within Your Means*) gets the lowest average score with only 43.53, suggesting that contents taught in module 3 might be difficult to understand and digest. A related point to consider is that the respondents of the module are relatively young, 14 out of 17 are between age 21 to 30, and 10 of them are single, and consequently not familiar with the topic of home purchasing or do not have the plan to purchase home yet.

Panel B reports participants' attitude towards good personal financial habits. The participants were asked to use one of the 5 terms including "Strongly Agree", "Agree", "Neutral", "Disagree" and "Strongly Disagree" to describe their attitudes towards the five different good personal financial habits. Each of the 5 choices is endowed with a score (20 for "Strongly Agree", 15 for "Agree", 10 for "Neutral", 5 for "Disagree" and 0 for "Strongly Disagree"). Therefore, theoretically, the total score of the attitudes questions for a participant ranges from 0 to 100. The average score for all the 629 surveys collected from the nine different modules is 66.62 with a standard deviation of 30.23. Specifically, participants in the 2nd module (*Building Your Next Egg*) got the highest average score of 76.65, with a standard deviation of 13.55. The average scores in other modules are also higher than average score of 66.62. A high (low) standard deviation indicates that the scores of a module are spread out over a wider (narrow) range of values, which means the learning outcome of the workshop is relatively heterogeneous (homogenous), and further implies that the modules with large standard deviation scores should focus on recruiting participants with similar demographics.

Participants in module 1 (*Understanding Loans and Credit/Are you Borrowing too Much*) got the lowest average score of 22.94, suggesting that participants in this module have not been fully convinced by the financial concepts delivered in the class. Attitude is very important if knowledge, intention to adopt behavior and confidence to do so are not low. It is plausibly due to the fact that the module was offered only as a talk to MHA participants officers aged 18 to 25. The age group of the participants could be the key factor affecting their attitude scores. It is possible that the module participants' financial attitudes and behaviors were more stubborn than other groups therefore the contents and the delivery method should be revised to better target the specific needs of these participants.

Panel C exhibits the confidence scores of participants on relevant financial decisions. Similar to the setups in Panel B, the participants were asked to use one of 4 terms including “Not Confident”, “A Little Confident”, “Confident” and “Very Confident” to describe their confidence level on the relevant financial decisions. The corresponding scores for the 4 terms are 0, 8, 15 and 20, respectively. Therefore, the total score of a participant should be ranged from 0 to 15. The average score of confidence is 55.18 with a standard deviation of 27.95. The highest score in the 8th module (*Making Sense Of Your Money*) suggests that participants in this module felt most confident in basic money management after attending the class. The confidence level of *Managing CPF for your Retirement* is low although the same participants achieve the highest knowledge scores. It could be explained by the fact that CPF matters are largely policy driven and changes occur quite frequently.

Panel D shows the intention score of participants on relevant financial decisions. As presented above, the participants are asked to use one of 5 terms including “I’m already doing this”, “YES”, “Maybe”, “Does not Apply to me” and “No” to delineate their intentions on financial decisions. The corresponding scores for the 5 terms are 20, 15, 10, 5 and 0, respectively. Subsequently, the total score of a participants ranges from 0 to 100. The average score of the 629 surveys is 64.43 with a standard deviation of 22.87. The values are quite similar across nine modules, except for the lowest average score (43.64) of the 6th module (*Introduction to Estate Planning*). The result of the 6th module indicates that participants were still reluctant to make suggested financial decisions after participating the module. It is worth noting that the inference is made based on a relatively small sample, and all of them are from the voluntary group. The module (*Introduction to Estate Planning*) is also a module which calls for action in relation to LPA; writing a will and making nominations for insurance policies and CPF inheritance. All of these are matters which require deep consideration on the part of the participants to act upon meaningfully.

Respondents with low financial literacy scores are randomly distributed in different modules and do not share the same demographic characteristics, therefore create challenges to clearly identify the vulnerable segments which may need to the financial education most. We define a respondent as financially illiterate if the sum of basic financial score and module specific knowledge score is less than 40. 85 participants are financially illiterate, and 65% of them are in age 20s, and 40% of them are single with no dependents. Besides, around 90% of the financial illiterate respondents earn the monthly salary below \$5000, which is consistent with the previous analysis showing that low-income participants obtained the worst knowledge scores.

Table 13: Basic Financial Literacy Questions

	Module Name Basic Score (range 0-100)	Sample Size	Average Score	Std.D ev	Min	Max
1	Understanding Loans and Credit	90	48.89	29.39	0	100
2	Building Your Nest Egg	136	63.68	24.37	0	100
3	Buying A Home Within Your Means	17	36.47	28.49	0	80
4	Do I Need Every Type Of Insurance?	50	55.60	32.65	0	100
5	Financial Planning Begins Now	86	58.60	29.55	0	100
6	Introduction To Estate Planning	11	69.09	33.90	0	100
7	Introduction To Personal Investing	147	62.59	26.09	0	100
8	Making Sense Of Your Money	49	44.08	30.27	0	100
9	Managing CPF Money For Your Retirement	43	70.23	27.73	0	100
	Total	629	58.25	28.89	0	100

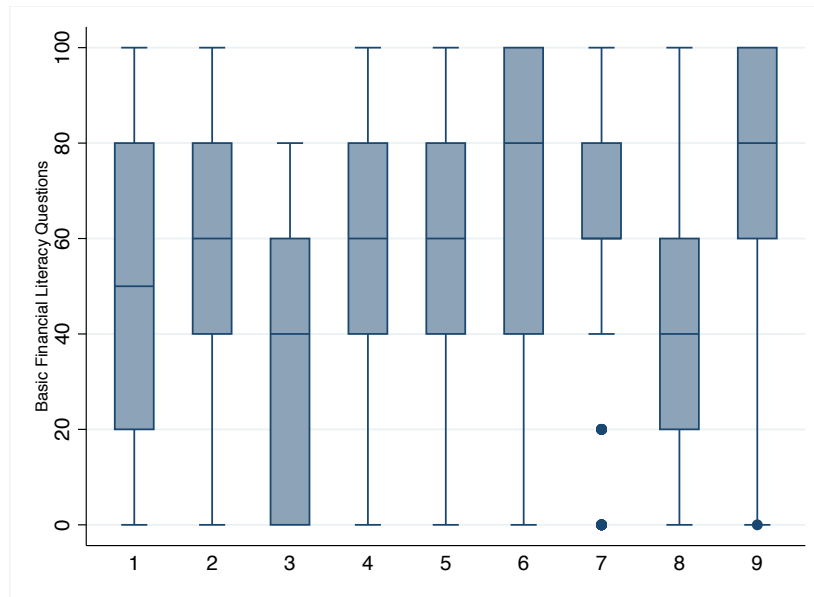


Table 14: Module Specific Questions

Panel A: Module Specific Financial Knowledge Scores

	Module Name Knowledge Score (range 0-100)	Sample Size	Average Score	Std. Dev	Min	Max
1	Understanding Loans and Credit	90	55.33	35.10	0	100
2	Building Your Nest Egg	136	57.79	23.69	0	100
3	Buying A Home Within Your Means	17	43.53	32.58	0	80
4	Do I Need Every Type Of Insurance?	50	49.20	39.63	0	100
5	Financial Planning Begins Now	86	61.63	26.07	0	80
6	Introduction To Estate Planning	11	63.64	36.68	0	100
7	Introduction To Personal Investing	147	43.13	25.40	0	100
8	Making Sense Of Your Money	49	52.24	25.11	0	80
9	Managing CPF Money For Your Retirement	43	70.23	21.98	0	100
	Total	629	53.99	29.20	0	100

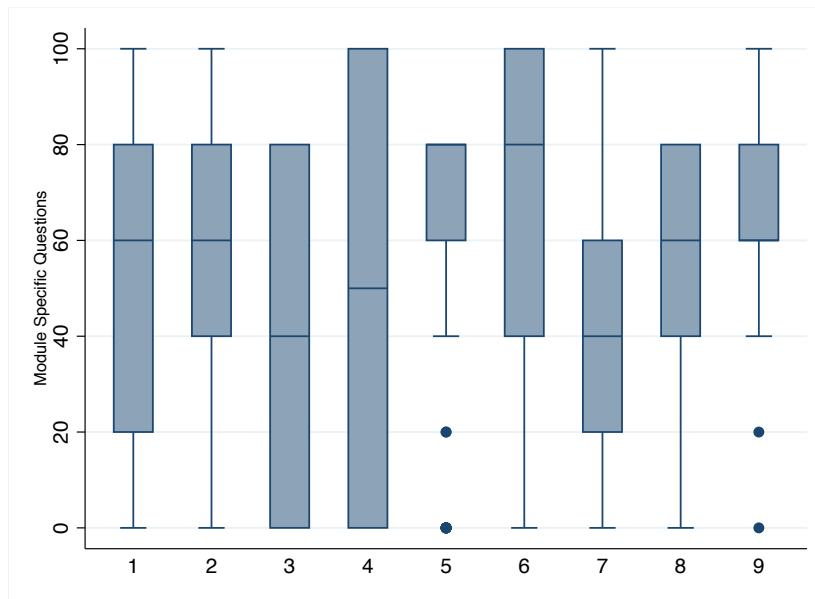


Table 14: Module Specific Questions

Panel B: Financial Attitude Scores

	Module Name Attitude Score (range 0-100)	Sample Size	Average Score	Std. Dev	Min	Max
1	Understanding Loans and Credit	90	22.94	36.01	0	100
2	Building Your Nest Egg	136	76.65	13.55	50	100
3	Buying A Home Within Your Means	17	66.18	40.06	0	100
4	Do I Need Every Type Of Insurance?	50	68.30	29.29	0	100
5	Financial Planning Begins Now	86	70.81	26.15	0	100
6	Introduction To Estate Planning	11	73.18	18.20	50	100
7	Introduction To Personal Investing	147	75.65	20.60	0	100
8	Making Sense Of Your Money	49	74.80	19.97	0	100
9	Managing CPF Money For Your Retirement	43	74.30	20.86	0	100
	Total	629	66.62	30.23	0	100

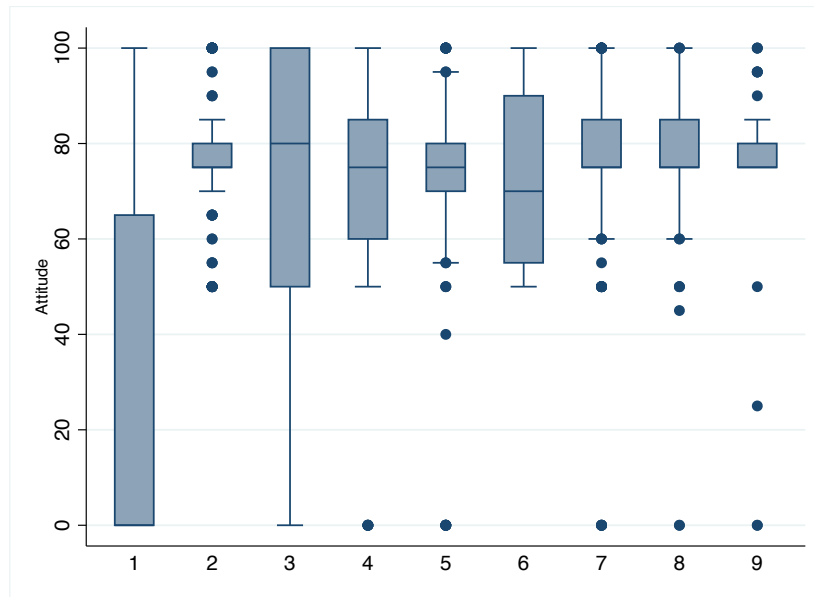


Table 14: Module Specific Questions

Panel C: Confidence Scores

	Module Name Confidence Score (range 0-100)	Sample Size	Average Score	Std. Dev	Min	Max
1	Understanding Loans and Credit	90	56.61	26.56	0	100
2	Building Your Nest Egg	136	56.69	25.03	0	100
3	Buying A Home Within Your Means	17	56.18	35.95	0	100
4	Do I Need Every Type Of Insurance?	50	46.50	31.22	0	100
5	Financial Planning Begins Now	86	60.00	26.14	0	100
6	Introduction To Estate Planning	11	50.91	34.77	0	100
7	Introduction To Personal Investing	147	51.26	28.92	0	100
8	Making Sense Of Your Money	49	66.12	24.14	0	100
9	Managing CPF Money For Your Retirement	43	49.53	30.33	0	95
	Total	629	55.18	27.95	0	100

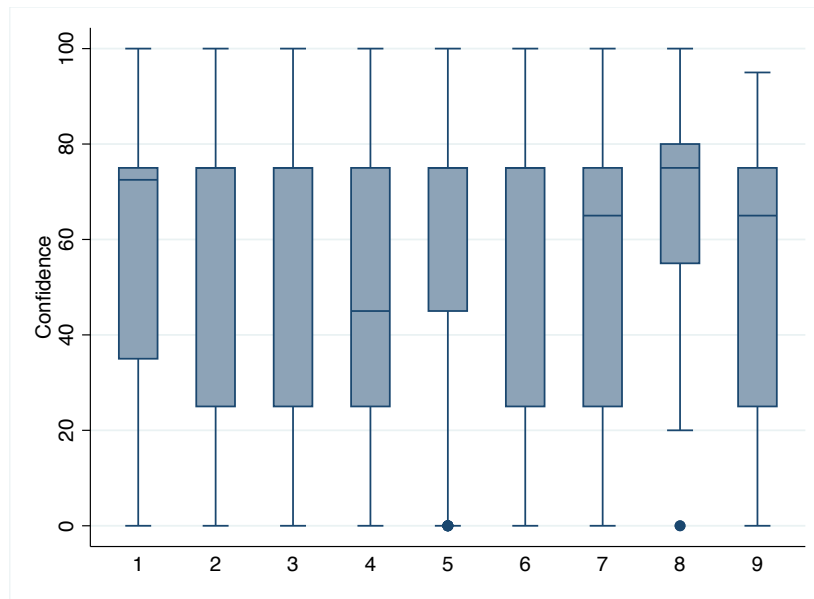
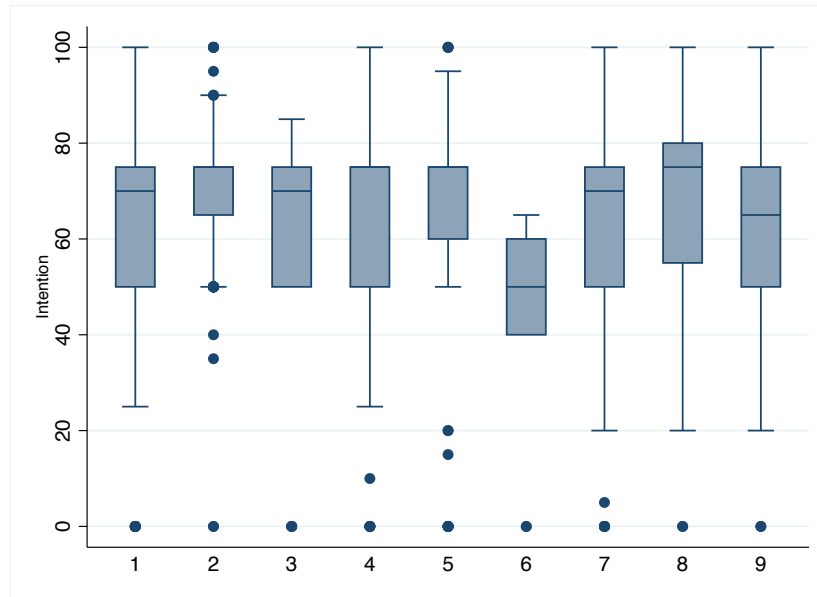


Table 14: Module Specific Questions

Panel D: Intention Scores

	Module Name Intention Score (range 0-100)	Sample Size	Average Score	Std. Dev	Min	Max
1	Understanding Loans and Credit	90	59.22	25.95	0	100
2	Building Your Nest Egg	136	69.30	14.92	0	100
3	Buying A Home Within Your Means	17	54.12	32.46	0	85
4	Do I Need Every Type Of Insurance?	50	64.10	28.15	0	100
5	Financial Planning Begins Now	86	64.83	24.99	0	100
6	Introduction To Estate Planning	11	43.64	22.92	0	65
7	Introduction To Personal Investing	147	64.83	20.73	0	100
8	Making Sense Of Your Money	49	68.88	22.30	0	100
9	Managing CPF Money For Your Retirement	43	62.44	24.16	0	100
	Total	629	64.43	22.87	0	100



6.4 Part 4: Financial Situation/Behavior

In part 4 of the survey, the respondents were asked to rate their perceived current financial circumstances. The survey is designed to identify changes in financial behaviors or decisions that impact long-term financial outcomes and behaviors since the changes are expected to be small and sample data is limited. To study the respondents' financial situation and behaviors, we included several "yes" or "no" questions in this part of the survey and the summary statistics are presented as following:¹¹

- (1). On average, each respondent has three bankcards, and 91.8% of the respondents have fewer than six bankcards.
- (2). 65% of the respondents prefer to take care of their financial affairs in person at the bank.
- (3). In addition, the survey participants were asked to assess their financial situation in their family, 92% of the respondents are happy with their current financial situation (choose "very good", "good", or "satisfied"). While only 5.43% of the respondents rated the financial situation of their family as very good, 26.09% rated their family financial situation as good.
- (4). In terms of saving behavior, 50 of the 84 respondents reported that they have never calculated how much they would like to save.
- (5). At the time of taking the survey, 41.3% of the respondents reported not having any loans; 19.57% reported having a mortgage loan, and 11.96% reported having a car loan.
- (6). Approximately half of the respondents reported having debt that is less than half of their annual income.
- (7). 33.71% of the respondents reported having less than the amount of life insurance coverage they thought they should have, and 31.46% reported having the required coverage. 9% of the respondents stated that life insurance is too costly for them.
- (8). 86.61% of the respondents did not receive any financial assistance within last 12 months. 4.99%, 3.94%, and 4.2% received financial assistance from

¹¹ Corresponding survey questions:

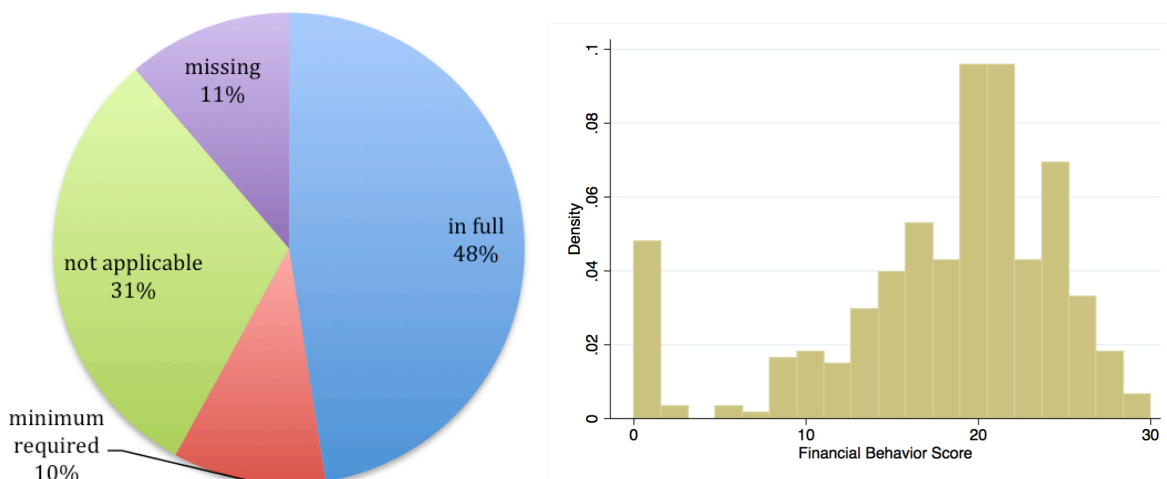
- (1). How many bank card(s) do you have?
- (2). What type of banking services do you use?
- (3). How do you assess the financial situation in your family?
- (4). Have you and your partner ever tried to find out how much you would have to save today to reach a certain standard of living at old-age?
- (5). What types of loans do you personally have?
- (6). What is your total debt excluding any loans for home and car purchase?
- (7). Which statement best describes your individual life insurance situation?
- (8). Have you received financial assistance within the last 12 months?
- (9). On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?

friends/family, government, and other resources, respectively.

- (9). A positive correlation of 0.27 between the self-assessed knowledge score and the self-assessed financial situation score suggests that the participants with higher self-assessed financial literacy level are more satisfied with their current financial situation.

Table 15 presents summary statistics of three questions, which are designed to evaluate participants saving, budgeting and retirement planning behavior.¹²To measure respondents' perceived financial capability in specific areas, module specific questions survey respondents' confidence, attitude, and intention on specific topics after the program. Another six questions intended to shed light on the financial behaviors of the program participants. In particular, this section is designed to collect information on the frequency of credit card and bill payments, financial planning, debt in the past six months, frequency of communication with friends and financial due diligence considerations. The pie chart in Figure 12 presents the information collected on frequency of credit card payments. The results of financial behavior scores are presented in the histogram of Figure 12. More specifically, participants can rate their behavior using one of the five terms "always", "often", "sometimes", "seldom", "never", "not applicable", with "always" equals to 5 and "not applicable" equals to 0 to calculate a financial behavior score. The financial behavior scores range from 0 to 30, and the distribution of financial behavior scores is presented in the histogram.

Figure 12: Financial Behaviors



¹² Corresponding survey questions:

Saving question: Do you save money each month? (Yes/No)

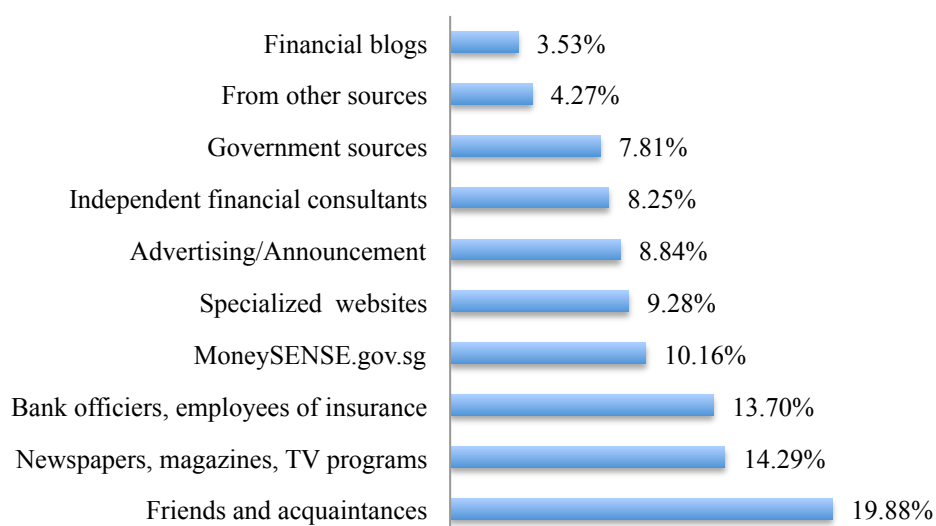
Budgeting question: Does your family keep records of income and expenditure? (Yes/No)

Retirement planning question: Have you and your partner ever tried to find out how much you would have to save today to reach a certain standard of living at old-age? (Yes/No)

Table 15: Financial Behavior (Saving, Budgeting and Planning)

	Saving	Budgeting	Retirement Planning
YES	85.8%	46.7%	37.8%
NO	8.7%	45.9%	55.1%
Missing ¹³	5.5%	7.3%	7.1%

Figure 13: Sources of Financial Information



Survey participants relied on multiple sources to get financial information about investment. As shown in Figure 13, friends and acquaintances, social media, and product sales are the top three popular resources of information. IFL can engage more in social media marketing of the financial literacy program, and cooperate with various organizations, such as churches and financial institutions to promote the program. 69 participants (around 10% of the respondents) reported that they used the *MoneySense* website to search for investment information. Although the question in the survey allows for multiple choices, which could lead to biased results when studying peer effects on financial literacy, the question still provides a strategic direction for program promotion in the future.

Moreover, we identify financial sophisticated participants by calculating the number of financial instruments and insurance products owned. Table 16 shows that while only 14.96% of respondents owned more than 2 types of financial products, 40.95% owned more than two different types of insurance products. Financial sophistication is a factor included in

¹³ Missing values are recorded when a respondent does not respond to the question for his/her reason (not understanding the question or not wanting to answer, etc.). The missing values in these three questions are below 8%, which is acceptable and will not reduce the representativeness of the sample.

the econometric analysis to study the association between financial supplication and financial literacy. Table 17 compares the learning outcomes of participants who attend multiple modules with those who attend a single module. The results from the two-group t-tests show that participants who attend two modules achieved best learning outcomes (highest scores in confidence and financial habits), while those who attend the three modules got worst scores in basic knowledge and attitude).

Table 16: Financial Sophistication

Types	Financial Products	Insurance Products
0	13.39%	18.11%
1	46.19%	22.57%
2	25.46%	18.37%
3	11.55%	14.44%
4	2.36%	17.85%
5	1.05%	8.66%

Table 17: outcomes of attending one module vs attending more than one module

Two-sample t test with equal variances					
Variables	G1(1)	Mean1	G2(2)	Mean2	MeanDiff
Basic Knowledge	173	2.988	168	3.03	-0.041
Specific Knowledge	173	2.751	168	2.708	0.043
Attitude	173	5.405	168	4.893	0.512
Confidence	173	7.347	168	8.173	-0.826**
Intention	173	7.705	168	8.354	-0.649
Financial Habits	173	16.896	168	19.771	-2.875***
Financial Sophistication	173	3.63	168	3.949	-0.319
Variables	G1(2)	Mean1	G2(3)	Mean2	MeanDiff
Basic Knowledge	168	3.03	40	2.475	0.555**
Specific Knowledge	168	2.708	40	2.638	0.071
Attitude	168	4.893	40	3.687	1.205***
Confidence	168	8.173	40	8.242	-0.069
Intention	168	8.354	40	8.45	-0.096
Financial Habits	168	19.771	40	15.2	4.571***
Financial Sophistication	168	3.949	40	2.45	1.499***
Variables	G1(1)	Mean1	G2(3)	Mean2	MeanDiff
Basic Knowledge	173	2.988	40	2.475	0.513*
Specific Knowledge	173	2.751	40	2.638	0.114
Attitude	173	5.405	40	3.687	1.717***
Confidence	173	7.347	40	8.242	-0.895
Intention	173	7.705	40	8.45	-0.745
Financial Habits	173	16.896	40	15.2	1.696
Financial Sophistication	173	3.63	40	2.45	1.180***

7. Econometric Model on Financial Literacy and Consumer Behavior

We performed a cross-sectional analysis to study the relationship between financial education and cognitive ability. Our survey questions allowed us to collect a large dataset on the participants' financial situation and behaviors. We also examined whether wealth, financial sophistication that represents the ownership of financial products and insurance products, financial habit that evaluates participants saving, budgeting, and retirement planning behavior, or all influenced the respondents' financial education. A multivariate analysis allowed us to determine which factors¹⁴ are linked to financial literacy after controlling for many other characteristics. We examined various factors that may affect financial literacy, including personal characteristics, peer effects, program satisfaction, and cognitive and financial decision-making ability. The final specification used to assess the relationship between financial literacy and a rich set of characteristics describing the survey participants is presented as following:

$$y = \delta \cdot \text{sophistication} + \theta \cdot \text{habits} + \eta \cdot \text{attitude} + \gamma \cdot \text{confidence} + \pi \cdot \text{intention} + \beta \cdot X + \varepsilon$$

where y is a continuous outcome variable that indicates a participant's financial knowledge scores, which is the sum of the basic financial literacy score and the module specific knowledge score; the vector X controls for personal characteristics of the participant (gender, race, education, and family income), and β is a vector of the parameters to be estimated; ε is independent and identically distributed error term.

In this case, the coefficient on the variable of interest can be interpreted as the marginal effect. The marginal effect is how the dependent variable changes when the independent variable changes by an additional unit, holding all other variables in the equation constant. The model above can be used to quantify the effects of different factors on the participant's financial knowledge scores. Therefore we can infer which factor is more important to the participant's financial knowledge based on the regression results. For example, δ can be interpreted as the change in a participant's financial knowledge scores from a one unit increase (or state change if dummy variable) of sophistication holding all other independent variables (habits, attribute, confidence, and intention) constant.

The regression results are presented in Table 18. Respondents who reported a higher level of confidence, attitudes, and intention scores are more knowledgeable. The measurements for financial habits and family financial sophistication are also strong and positively associated with the respondents' level of financial literacy. 100% increase in financial sophistication is associated with 21.3% higher in financial literacy. These results point to the significance of personal characteristics in the development of financial literacy. Since the differences are statistically significant, personal characteristics, such as family wealth,

¹⁴ Factors that have been examined include: attitude, confidence, intention, financial sophistication, financial habits, gender, race, education, family income, and peer effects.

education, and races may also help to explain the differences in financial literacy. Malay and Indian respondents are 5.4% and 4.7% less knowledgeable than Chinese in terms of their financial literacy scores. Higher family income is strongly associated with higher financial literacy. Moreover, the educational level of the respondents' parents is strongly associated with the respondents' level of financial literacy, while the peer effects¹⁵ is insignificant in the study.

Table 18: Deterministic Factors of Financial Literacy

Dependent Variable: ln(Financial Literacy scores)	(1) Financial Literacy	(2) Financial Literacy
Attitude	0.111*** (0.0243)	0.0974*** (0.0242)
Confidence	0.0810*** (0.0300)	0.0827*** (0.0304)
Intention	0.0732*** (0.0228)	0.0801*** (0.0228)
Habits	0.130*** (0.0235)	0.141*** (0.0236)
Sophist	0.213*** (0.0388)	0.146*** (0.0401)
Male (base=female)		-0.0168 (0.0165)
Malay (base=Chinese)		-0.0544*** (0.0166)
Indian (base=Chinese)		-0.0471* (0.0249)
Other races (base=Chinese)		-0.0236 (0.0362)
Low education (base=college and above degree)		-0.0321** (0.0155)
\$30,001 - \$90,000 (family income below \$30,001)		0.0699*** (0.0214)
90,001 - \$150,000 (family income below \$30,001)		0.0805*** (0.0290)
\$150,001 and above (family income below \$30,001)		0.105** (0.0488)
Constant	0.888*** (0.0850)	1.005*** (0.0883)
Observations	628	599
R-squared	0.366	0.400

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All coefficients of interests in Table 18 are significant at 99% confidence level. Programs focusing on one particular age group could be more effective and efficient than those targeted at multiple age groups, and this is due to the substantial differences in accumulated wealth at the different life stages. It worth noting that there are may be a small percentage

¹⁵ The peer effect stays irrelevant mainly due to the nature of the survey question, which is designed as a multiple-choice question, creating challenges to rule of the influence from other sources to receive financial information. Simply include the factor of peer effects into the regression would lead to spurious results. Again, randomize trial control that designed to study the peer effects can solve the issue.

of participants who do not have financial knowledge increments and behavioral change after attending the program due to heterogeneity. For instance, financial education for low income consumers may not lead to behavioral changes if they do not have the financial means to save more, invest or buy insurance. Some modules contain a lot of formulae and calculations, which may be difficult for participants to understand fully in one class and apply to future financial decisions. The senior participants show low willingness to engage in activities related to the computation of credit card interest or other complex mathematic problems.

8. Two-Group Comparison and Behavior Change Analysis

We collected three different samples: the control group who did not attend the financial education program at the time of being surveyed, the treatment group who participated in the baseline survey right after the module, and the treatment group who completed both the baseline survey and the follow-up survey. However, there are significant differences in the number of participants in the three samples, which may induce sample selection bias to some degree. In particular, the control group may not be comparable to the treatment groups. Taking advantage of the large treatment group who completed the baseline survey, we used propensity score matching techniques to construct a matched sample of the treatment and control groups¹⁶.

Propensity score matching attempts to mimic randomization by creating a sample of respondents who attended the program that is comparable on all observed covariates to a sample of respondents that did not received the financial literacy education. We estimated propensity scores using a logistic regression based on household annual income, gender, education, age, race, occupation, and specific module attended. Table 19 presents the comparison of respondents' characteristics before and after matching. The differences between the treatment and control groups in various personal characteristics shrink significantly after matching, indicating that we have created reasonably balanced and comparable treatment and control individuals.

¹⁶ Propensity Score Matching (PSM) attempts to reduce the bias due to confounding variables that could be found in an estimate of the treatment effect obtained from simply comparing outcomes among units that received the treatment versus those that did not. Since the study collects a relatively small sample of the control group and it is practically impossible to eliminate all of the confounding factors and bias, we use the technique to find the most similar pair in the treatment and the control group. We select 90 respondents from the treatment group who are the most similar to the 34 individuals in the control groups.

Table 19: Treatment Group vs. Control Group on Personal Characteristics

Panel A: Two-sample T test with equal variances, using unmatched sample					
Variables	Without Education (Sample size)	Mean1	Right After Participation (Sample size)	Mean2	Average Differences
Gender	34	1.765	629	1.722	-0.043
Age	34	1.059	629	1.749	0.690***
Race	34	1.529	629	5.413	3.884***
Marital Status	34	1.529	629	2.235	0.706***
Family Income	34	1.765	629	4.262	2.498***
Education	34	2.333	629	4.509	2.175***

Panel B: Two-sample T test with equal variances, using matched sample					
Variables	Without Education (Sample size)	Mean1	Right After Participation (Sample size)	Mean2	Average Differences
Gender	34	1.765	90	1.735	-0.029
Age	34	1.059	90	1.000	-0.059
Race	34	1.529	90	3.735	2.206***
Marital Status	34	1.529	90	1.118	-0.412**
Family Income	34	1.765	90	4.471	2.006***
Education	34	2.333	90	4.912	2.078***

We then used the nearest neighborhood method based on the estimated propensity scores. The differences in socio-demographic characteristics between the control group and treatment groups become statistically and economically indistinguishable from zero after matching. Thus, the control and treatment groups are reasonably comparable, allowing us to identify the average program effect and behavioral changes three months after the module. Panel A in Table 20 shows the comparison of financial knowledge before and after attending the program using unmatched sample (full sample), and Panel B presents the comparison of learning outcomes using matched sample. Table 20 shows that program participants' are more confident in making financial decision.

Table 20: Treatment Group vs. Control Group on Knowledge, Attitude, Confidence, and Intention Changes

Panel A: Two-sample T test with equal variances, using unmatched sample					
Variables	Without Education (Sample size)	Mean1	Right After Participation (Sample size)	Mean2	Average Differences
Basic Knowledge	34	2.732	629	2.910	0.178**
Specific Knowledge	34	3.382	629	2.837	-0.545***
Attitude	34	5.735	629	5.043	-0.692
Confidence	34	6.235	629	8.502	2.266***
Intention	34	8.353	629	9.238	-0.885

Panel B: Two-sample T test with equal variances, using matched sample					
Variables	Without Education (Sample size)	Mean1	Right After Participation (Sample size)	Mean2	Average Differences
Basic Knowledge	34	2.732	90	3.233	0.501**
Specific Knowledge	34	3.382	90	3.391	0.009
Attitude	34	5.735	90	4.856	-0.88
Confidence	34	6.235	90	8.578	2.342***
Intention	34	8.353	90	8.9	0.547

The main objective of financial education program is to disseminate basic financial information rather than to go into detail about advanced topic and it is necessary to adjust the contents of the module based on the audiences' life stages to achieve optimal results (Agarwal, et al., 2009). For instance, one module Introduction to Personal Investing, which was offered at the National University of Singapore, served more than 200 junior college students aged 16 to 18. According to the students' feedback, the financial topics covered in the module are interesting and important, but not immediately useful to them.

Table 21: Knowledge, Attitude, Confidence, and Intention Changes

Two-sample T test with equal variances					
Variables	Right After Participation (Sample size)	Mean1	3-months After Participation (Sample size)	Mean2	Average Differences
Self-assessed Knowledge	23	4.043	23	4.391	0.348
Basic Knowledge	23	3.522	23	3.957	0.435
Specific Knowledge	23	3.304	23	3.043	-0.261
Attitude	23	5.947	23	5.274	-0.673
Confidence	23	7.348	23	7.443	0.095
Intention	23	9.348	23	10.304	0.957

We collected a small sample of survey participants who took the follow-up survey 3 months after the end of the module¹⁷, and Table 21 shows the results. We observe the self-assessed knowledge and basic knowledge scores increase by 0.348 and 0.435, respectively. A comparison of the average scores of the module specific knowledge right after

¹⁷ Scores range from 0 to 100 may overestimate the program effect in a panel setting. Therefore, a different scaling is used in the before-after and treatment-control analysis to obtain conservative program effects and for the easiness of comparison across the module.

The basic and module specific knowledge is described by a total score ranging from 0 to 5, and each question is assigned to 1 score. Each attitude question is endowed with a score (2 for "Strongly Agree", 1 for "Agree", 0 for "Neutral", -1 for "Disagree" and -2 for "Strongly Disagree").

The participants were asked to use one of 4 terms including "Not Confident", "A Little Confident", "Confident" and "Very Confident" to describe their confidence level on the on relevant financial decisions. The corresponding scores for the 4 terms are 0, 1, 2 and 3, respectively.

For the intention questions, participants can choose among "I'm already doing this", "YES", "Maybe", "Does not Apply to me" and "No" to delineate their intentions on financial decisions. The corresponding scores for the 5 terms are 3, 2, 1, 0 and -1, respectively.

participation and three months after participation does not show a significant drop due to memory decay. In addition, the respondents' intention score improve by almost 1¹⁸, suggesting that the financial education program effectively helped them to accumulate basic financial knowledge and build their intent to apply knowledge acquired when making financial decisions.

The follow-up survey provides encouraging results. The financial behavior scores¹⁹ of participants after three months range from 18 to 30, with an average score equals to 23.84. The average score of financial behavior in the baseline survey is 18.1. Therefore, we observe significant changes to their financial behaviors. In particular, respondents more frequently reduced financial debts (e.g. credit cards, bills, and debts), set financial goals, communicate with friends about financial investments, and more salient to financial products.

In our analysis, we explicitly tested for differences between the treatment and control groups in the level of basic financial knowledge and program-specific knowledge, and examined any changes three months after participation in the program. As shown in Table 20 both the basic knowledge and program-specific knowledge scores increased right after participation. Although the level of financial knowledge may not increase further three months after the program, we observed that the participants have a higher level of confidence and are more positive about their financial management goals in terms of intention.

9. Discussion and Concluding Remarks

The structured questionnaire designed for the study of participant behavior helps us to understand the effectiveness of the program in terms of teaching methods and content delivery. In the evaluation framework, post-learning surveys are conducted to assess the consumers' behavioral changes. The report provides a detailed descriptive statistics and statistical analysis of the survey results collected in the financial literacy survey. The study examines topics that are of interest to participants, gather feedback and provide various ways to improve the program. In addition, the study finds that financial sophistication, habits, confidence, attitudes, intention are positively correlated with financial literacy.

The data collected from the structured questionnaire are encouraging. The survey results show that the basic knowledge and program-specific knowledge scores increased right after participating in IFL's programmes, and the participants have a higher level of confidence

¹⁸ With a -5 to 15 scale, an increase of 0.957 can be considered economically significant but not statistically significant due to small sample size.

¹⁹ Corresponding survey questions:

Saving question: Do you save money each month? (Yes/No)

Budgeting question: Does your family keep records of income and expenditure? (Yes/No)

Retirement planning question: Have you and your partner ever tried to find out how much you would have to save today to reach a certain standard of living at old-age? (Yes/No)

and are more positive about their financial management goals in terms of intention. Moreover, the follow-up study indicates that the financial education program effectively helped program participants to accumulate financial knowledge and build their confidence in making financial decisions.

Based on the in-class observations and the statistical analysis on the survey results, the following improvements can be done to better deliver the contents of the program and satisfy the needs of the program participants:

9.1 Administrative work

- Use paper/the web-based form to book an appointment instead of calling in. The appointment form should collect general personal information (e.g. age, gender²⁰, annual household income, occupation, ethnicity, financial sophistication). Current IFL's pre-survey could be converted to the online registration form. Group participants with the similar background or knowledge level using the data collected from the online registration portal.
- Each module needs to set clear priorities by determining their intended audience and identifying their needs and preferences to be selective
- Provide marketing material as salient and relevant to the target audience as possible.
- Get sufficient funding needed to support the supply of financial education programs (e.g. conduct the sufficient number of classes to meet consumer demand, use online registration portal, design print (e.g. small booklet) and online resources (e.g. videos that are easily accessible, mobile apps, and invest in human resources to grow the program).

9.2 Learning Modules

- Get participants to think through their questions first through pre-screening
- Individual modules should have narrower scope by focusing on conveying certain critical concepts, policy updates, and recommended practices, rather than present too much material at once. In particular, modules in each topic should educate program participants about how to seek further information.
- The current set of cases studies and discussion scenarios are effective, IFL should keep providing more specific case studies and encourage participants to actively take part in the discussion;
- Encourage participants to share experience and thoughts on financial planning and investment. More interactive learning, less lecturing.

²⁰ Research suggests that gender and age have a differencing role to play in financial decision-making. For instance, women have different investment preferences and respond differently to the framing of choices (Croson and Gneezy, 2009; Barber and Odean, 1998). Seniors have different financial needs, concerns, and cognitive ability (Agarwal et al., 2007). Therefore, the grouping should be based on age and gender first.

- Pay special attention to modules with low knowledge and intention scores (e.g. *Buying a Home within Your Means* and *Making Sense of Your Money*), by emphasizing the importance of adopting best practice financial behavior and well-established attitudes, reduce the time of lecturing topics related to maths and calculation, and provide program participants with reliable online resources or mobile apps.

9.3 Post-learning

- Design mobile applications to help participants with financial budgeting, planning, and financial products selection
- To retain financial knowledge after participation by providing apps and online sources to digitize the course material for review purpose. Such materials should summarize key concepts and information delivered, in a format that prompts recall (e.g. checklist, summary graphs, etc.)
- Provide a more approachable and effective way to communicate after class: provide financial advices through various channels such as email, phone and online chat after workshop and offer personal advices to program participants from different background
- Adopt more real-time responses, such as webinars, which would give participants real-time feedback and interactive learning experiences. Participants could then access answers to any questions they may have regarding the study materials.

9.4 Periodic Evaluation and Review of the Program

A robust evaluation can lead to strong claims about the program and draw generalizable conclusion to the population. Implementing a true *experimental evaluation* requires a participant to be randomly assigned to a treatment group that receives financial education from the program, or a control group that does not participate in the program. Randomized controlled trial experiment has been used to evaluate federal financial education programs in the U.S. (Theodos, Simms, Sharygin, et al., 2014). The phase-in strategy could be used to evaluate programs with a specific demographic focus. For instance, the phase-in method has been used to deal with the non-randomization assignment of program audiences (Collins, 2008; Servon and Kaestner, 2008). However, a true experimental evaluation (randomization trial control) is challenging due to the nature of the financial literacy program. IFL currently selects a *non-experimental evaluation* design, which is easier to implement by conducting pre-post surveys to assess participants before and after they participate and measure how much participants have changed as a result of the education. Therefore, the future evaluation framework can follow a *quasi-experimental design*, as shown in Figure 15, which compares program participants with those who did not attend the program. Matching technique can ensure control groups are as similar as possible to treatment groups. In particular, the future evaluation should be able to collect responses from different organizations to achieve a well-representative sample. A program review should

be conducted by IFL every two years, and a longitudinal survey conducted by the IFL or a third party every five years is recommended.

The evaluation should include *need assessment* that helps to establish the need for the program, *formative evaluation* that ensure the program is working in the intended ways, and *summative evaluation* that prove the effectiveness of the program. First, it should be determined whether the program's main objective is to improve the participants' financial knowledge, skills, attitude, or confidence. More specifically, it should be clear whether the modules are designed to encourage a specific behavior, such as saving more aggressively in a retirement scheme or managing debt more effectively. Second, the questionnaire design needs to identify key indicators of behavioral changes that aligned with program objectives, for instance, personal banking practices such as the number of participants who changed their credit card payment behavior by paying back full outstanding bills, debt payment schemes, insurance purchase, etc. Third, smaller samples that include comparable control and treatment groups should be collected to address multiple targets. A suggested structure and key components of the evaluation framework are demonstrated in Figure 14.

Figure 14: Evaluation Framework

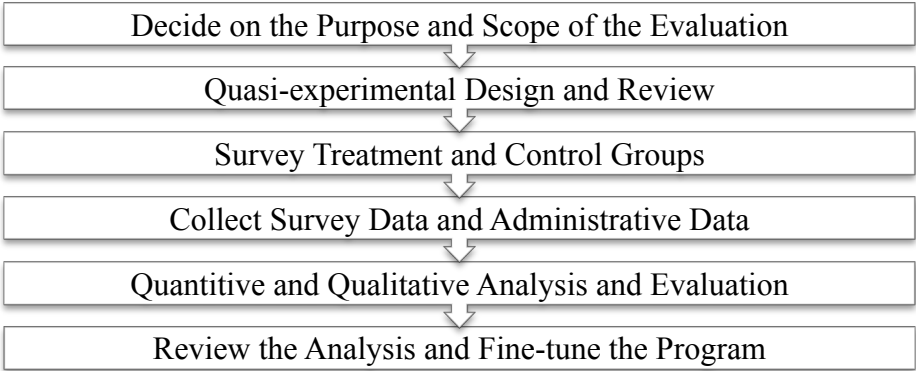
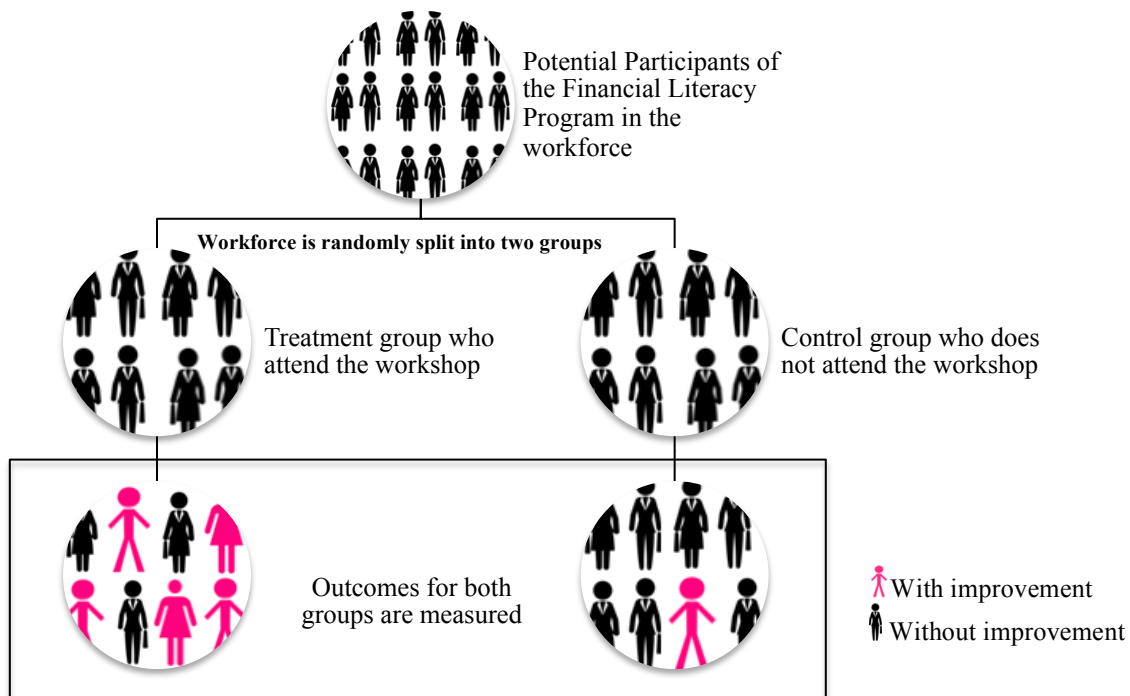


Figure 15: Quasi-Experimental Design



Furthermore, the evaluation of financial literacy program requires high quality data on individuals who attend financial education. Collecting high quality data could help to identify learning priorities and inform financial education strategies by analyzing changes in financial knowledge and behavior of program attendants over time. To assess financial literacy programs, the current evaluation only relies on surveys distributed to participants before and after a financial education program. In general, magnitudes of changes in behavior outcomes are small, leading to challenges in measurement. Since it is difficult to assess the effects of a financial literacy program on participants’ behavior changes in financial decision-making, collecting administrative records can significantly reduce the measurement bias. An efficient evaluation can be achieved by analyzing administrative information that existed prior to the evaluation. Since administrative data is number-based and immediately accessible, it is very useful for identifying trends and patterns. The sequence of data collection is established in Figure 17.

The survey questionnaire in the future evaluation could follow the current survey questionnaire. Since it is important to understand the program’s short-term impacts, such as increased financial knowledge and behavior changes, it is crucial to conduct follow-up surveys to identify long-term effects. Follow-up surveys should be conducted three months and six months after the program to measure the amount of information retained by the program participants. The survey, which can be done via an online questionnaire or the phone, is designed to compare the participants’ financial knowledge, behavior, and attitude with earlier outcomes. The key components of the survey are demonstrated in Figure 16.

Current evaluation of financial literacy programs lacks the resources for longitudinal study, yielding to a relatively low response rate. The response rate will be improved with more support from various participating organizations, to provide valuable insight on the long-term impact of financial programs on participants' financial well-being and offer useful implications for practice, policy, and funding to program organizers and policymakers in Singapore.

Figure 16: Key Components of the Questionnaires

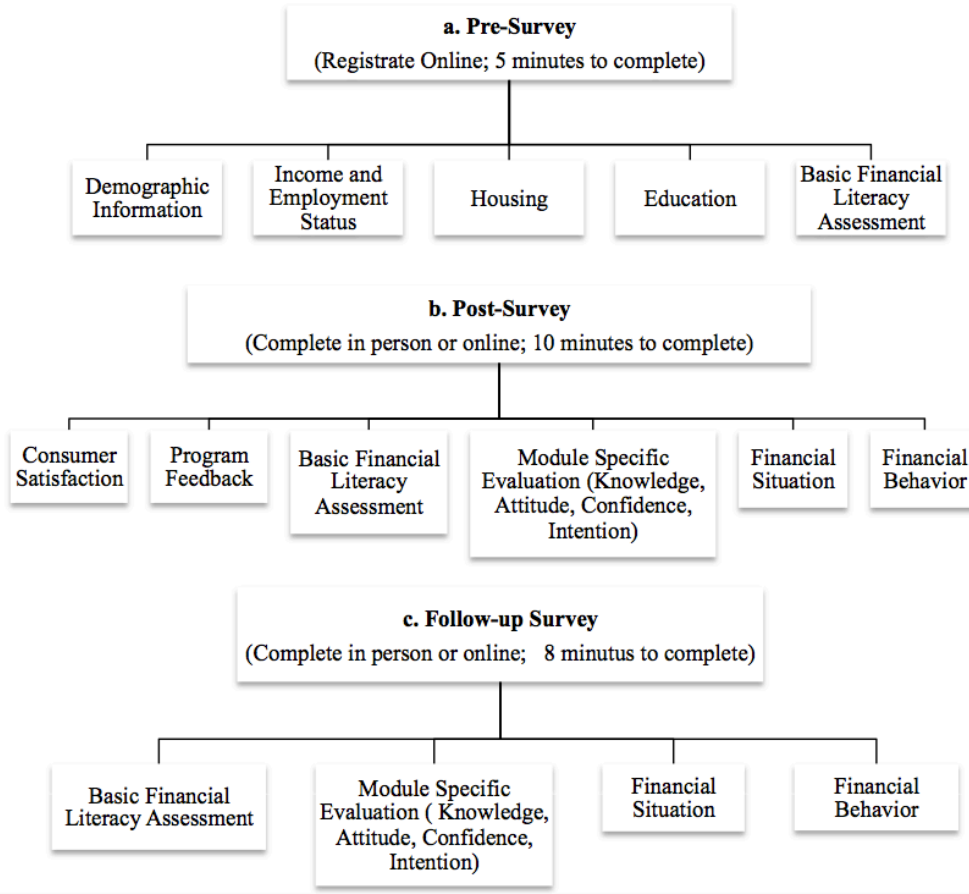
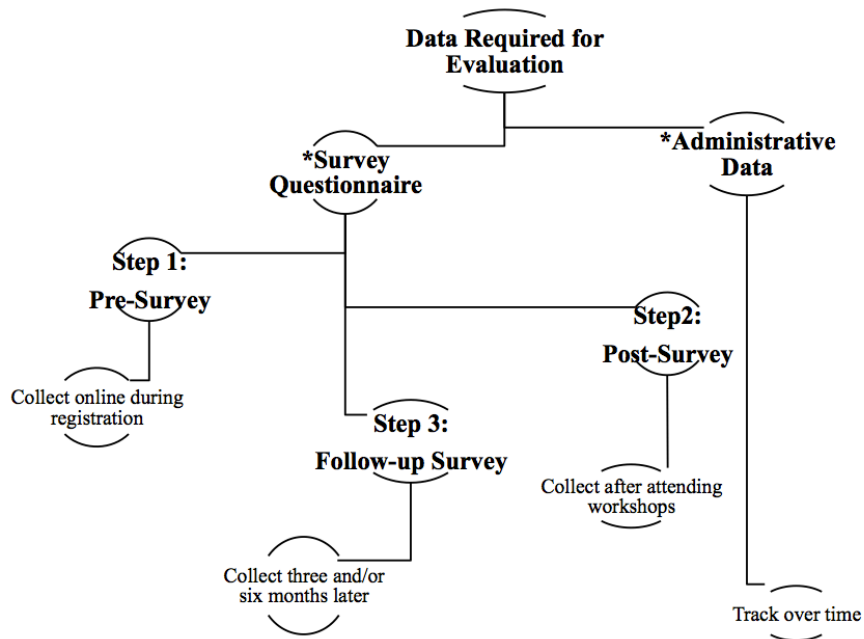


Figure 17: Data Collection



Reference

- Agarwal, S., Amromin, G., Ben-David, I., Chomsisengphet, S., & Evanoff, D. D. (2015). Financial literacy and financial planning: Evidence from india. *Journal of Housing Economics*
- Agarwal, S., Amromin, G., Ben-David, I., Chomsisengphet, S., & Evanoff, D. D (2011). "Financial Counseling, Financial Literacy, and Household Decision Making. *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*, Oxford University Press, October 2011, Pp. 181-205
- Agarwal, S., Amromin, G., Ben-David, I., Chomsisengphet, S., & Evanoff, D. D. (2014). The Effectiveness of Mandatory Mortgage Counseling: Can One Dissuade Borrowers from Choosing Risky Mortgages? NBER working paper.
- Agarwal, S., Driscoll, J. C., Gabaix, X., & Laibson, D. (2009). The age of reason: Financial decisions over the life cycle and implications for regulation. *Brookings Papers on Economic Activity*, 2009(2), 51-117.
- Brad M. Barber and Terrance Odean, and "Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors," *Journal of Finance* 55, No. 2 (2000): 773–806.
- Bucher-Koenen, Tabea, and Annamaria Lusardi. "Financial Literacy and Retirement Planning in Germany." *Journal of Pension Economics and Finance* 10, no. 04 (October 2011): 565–84. doi:10.1017/S1474747211000485.
- Chang, L., Krosnick, J., 2009. National surveys via RDD telephone interviewing versus the Internet: comparing sample representative- ness and response quality. *Public Opinion Quarterly* 73, 641–678.
- Dawes, T. A. (2014, June). Academic libraries' impact on financial education: A year of programs and projects. *C&RL News*, 75(6), 374–376, 391.
- Fox, J. J., and Bartholomae S. (2008), "Financial education and program evaluation" in Xiao J. J. (ed.) *Handbook of consumer finance research*. New York: Springer, pp. 47–68.
- Dobrescu, L. I., Greiner, B., & Motta, A. (2015). Learning economics concepts through game-play: An experiment. *International Journal of Educational Research*, 69, 23-37.
- Hong, H.G., Kubik J.D. and Stein J.C. (2004). _Social interaction and stock market participation_, *Journal of Finance*, vol. 59(1), pp. 137–63.
- Huston, Sandra J. "Measuring Financial Literacy." *Journal of Consumer Affairs* 44, no. 2 (2010): 296–316.
- Institute of Financial Literacy, 2014, Internal Report.
- Jappelli, Tullio. "Economic Literacy: An International Comparison*." *The Economic Journal* 120, no. 548 (2010): F429–F451.
- Jorgensen, Bryce L., and Jyoti Savla. "Financial Literacy of Young Adults: The Importance of Parental Socialization." *Family Relations* 59.4 (2010): 465-78. Web

- Lusardi, Annamaria, and Olivia S. Mitchell. "The Economic Importance of Financial Literacy: Theory and Evidence [†]." *Journal of Economic Literature* 52, no. 1 (March 2014): 5–44.
- Lusardi, Annamaria, Pierre-Carl Michaud, and Olivia S. Mitchell. 2011. "Optimal Financial Literacy and Saving for Retirement." Wharton School Pension Research Council Working Paper 2011-20.
- Lusardi, Annamaria, Pierre-Carl Michaud, and Olivia S. Mitchell. 2013. "Optimal Financial Knowledge and Wealth Inequality." National Bureau of Economic Research Working Paper 18669.
- Lusardi, Annamaria, and Olivia S. Mitchell. "Financial Literacy and Retirement Planning in the United States." *Journal of Pension Economics and Finance* 10, no. 04 (October 2011): 509–25.
- Lusardi, Annamaria, and Olivia Mitchell. "Financial Literacy and Planning: Implications for Retirement Wellbeing." (2011): n. pag. Web
- Lusardi, A. and Tufano P. (2009). *_Debt literacy, financial experiences, and overindebtedness_*, NBER Working Paper No. 14808.
- Lusardi, Annamaria, and Olivia S. Mitchell. 2007a. "Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth." *Journal of Monetary Economics* 54 (1): 205–24.
- Lusardi, Annamaria, and Olivia S. Mitchell. 2007b. "Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education." *Business Economics* 42 (1): 35–44.
- Lusardi, Annamaria, Olivia S. Mitchell, and Vilsa Curto. "Financial Literacy among the Young." *Journal of Consumer Affairs* 44, no. 2 (2010): 358–80.
- Lusardi, A., D. Schneider, and P. Tufano. 2011. Financially fragile households: evidence and implications. *NBER Working Paper 17072*.
- Meir Statman et al., "Investor Overconfidence and Trading Volume," *Review of Financial Studies* 19, No. 4 (2006): 1531–1565.
- Moore, D. (2003). Survey of financial literacy in Washington State: Knowledge, behavior, attitudes and experiences. *Technical report 03-39*. Social and Economic Sciences Research Center, Washington State University.
- OECD report, 2013. "Evaluating financial education programmes: OECD-INFE Survey, evidence, policy instruments and guidance". *OECD Journal, 2013*.
- Odean, Terrance, "Do Investors Trade Too Much?" *American Economic Review* 89, No. 5 (1999): 1279–1298.
- Porto, N., & Xiao, J. J. (2016). Financial literacy overconfidence and financial advice seeking. *Journal of Financial Service Professionals*, 70(4), 78.

Appendix A: Facilitator Interaction Survey in July 2015



Trainer Interaction Survey - July 2015

Interviewee Contact Details

Name: _____

Gender: _____

Email Address: _____

Phone Number: _____

Please check the box

Q1. Please choose the modules you teach

- Making Sense Of Your Money
- Financial Planning Begins Now
- Do I Need Every Type Of Insurance?
- Are You Borrowing Too Much?
- Building Your Nest Egg
- Take Charge Of Your Credit Facilities
- Managing CPF Money For Your Retirement
- Introduction To Personal Investing
- Is The Deal Too Good To Be True?
- Buying A Home Within Your Means
- Starting A Family
- Introduction To Estate Planning
- Understanding Basic Health Insurance Schemes
- Money Management For Youth
- Chinese Topics
- Other (Please specify _____)

Q2. Which ethnic group do you belong to ?

- 1 - Chinese
- 2 - Indian
- 3 - Malay
- 4 - Other (Please specify _____)

Q3. On average, how often do program participants communicate with you (in each module)?

- Never
- 1 to 3 times
- 4 to 6 times
- 6 to 9 times
- more than 10 times

All Responses Will Be Kept Confidential And Will Only Be Used For This Study

Page 1 of 3

Q4. How often do you actively talk to program participants (in each module)?

- Never
- 1 to 3 times
- 4 to 6 times
- 6 to 9 times
- more than 10 times

Q5. At what level of involvement people participate in the module?

- Participants are not involved in the module at all
- Participants are not very involved in the module
- Participants are involved in the module and show some interests to the topic
- Participants are very involved in the module and vey interested in the topic

Q6. How do you think about the difficulty level of study material?

- Very difficult
- Somewhat difficult
- Adequate
- Somewhat easy
- Very easy

Q7. To what percent, do you think the audience can understand the study material?

- 90% - 100%
- 70% - 90%
- 50% - 70%
- 30% - 50%
- below 30%

Q8. Which part do you think is most difficult for participant to understand?

Comments: _____

Q9. How do you think about the relevancy of study material to participants?

- Very relevant
- Somewhat relevant
- Not very relevant
- Not relevant at all

Q10. Which part do you think is not relevant to participants' future financial decision making?

Comments: _____

Q11. Among all the sections of study material, which part do you think is most effective for participants to reach the teaching objective?

- Concept description
- Case study

- Practical example
- Calculation related practices
- Graphical presentation
- Experience sharing
- Others (Please specify _____)

Q12. In the past six month, how often were you involved in any out-of-class activities with participants? (Consultation after the module ended)

- Never
- 1 to 3 times
- 4 to 6 times
- 6 to 9 times
- more than 10 times

Q13. In which form did program participants consult with you after the module ended ? (can choose more than one options)

- Participants never contact me after module ended
- Email
- Phone calls
- In-person
- Other (Please specify _____)

○ Please circle the appropriate response

	Never					Always				
I talk enthusiastically about the subject.	1	2	3	4	5	1	2	3	4	5
I explain things clearly.	1	2	3	4	5	1	2	3	4	5
I like to use practical examples.	1	2	3	4	5	1	2	3	4	5
I like to share my personal experience with participants.	1	2	3	4	5	1	2	3	4	5
I am willing to explain things again.	1	2	3	4	5	1	2	3	4	5
I realize when participants don't understand.	1	2	3	4	5	1	2	3	4	5
I realize when participants do not pay attention.	1	2	3	4	5	1	2	3	4	5
Participants has to be silent in the class.	1	2	3	4	5	1	2	3	4	5
I have a sense of humor.	1	2	3	4	5	1	2	3	4	5
If participants want something, I am willing to cooperate.	1	2	3	4	5	1	2	3	4	5
I encourage participants to ask questions.	1	2	3	4	5	1	2	3	4	5

All Responses Will Be Kept Confidential And Will Only Be Used For This Study

Page 3 of 3

From IFL Waseem: Please include the latest version of the survey questionnaire in the appendix as well.