# Utilizing Experiential Learning to Improve Financial Literacy among Young Adults through STEM Service-Learning Activity during Movement Control Order

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#### Abstract

Financial education in the community is an important aspect of developing a good human and society. Sustainable development should be able to mobilize every individual in the community and the country to work together toward a more economicsustained lifestyle for every individual. Many researchers suggested that financial attitude, parental financial socialization, and financial literacy have a positive and significant relationship with prudent financial management practices. In this study, we aim to construct a personal financial literacy program through a service-learning program under one of the mathematical courses (SQQM3024 Mathematical Modelling) in the university to ensure the sustainability of the program. This course is selected since it is one of the main subjects that need to be completed by BSc (Hon) Business Mathematics students and is normally enrolled by students in their final year. thus sufficient maturity in STEM-based knowledge is expected. The program will be developed by using the ExDiD method. The finding shows that the method can construct a structured program and the delivery of the program can effectively improve communication skills among team members, the exploration of data, brainstorming ideas, and delivery to targeted participants, making service learning an effective tool for sustainable personal financial literacy programs to improve the level of financial literacy in the community.

**Keywords:** Financial education, Community empowerment, Service learning

#### Introduction

Financial education is important for every individual; however, the most vulnerable group should be given extra concern on this subject. A study in Cambodia and Vietnam found that younger, urban, more educated, and higher-income individuals have higher financial literacy scores, compared to their counterparts (Morgan & Trinh, 2019). However, according to Wagner (2019), if people from a lower-income group be given a financial education, they tend to perform better in understanding the content of these courses, thus the need for us to reach these groups on a large scale. A large study of 22,000 respondents in Nigeria shows that financial literacy significantly determines savings patterns with formal and informal financial institutions (Karakurum-Ozdemir, Kokkizil & Uysal, 2019), thus signifying the need to provide financial education to empower our people more extensively.

In Malaysia, Kimiyaghalam and Yap (2017) in their study focusing on Kuala Lumpur found that 51.54% of respondents have basic financial knowledge, but when probed deeper, only 37 have advanced financial literacy. Note that the advanced level in this study is referring to general knowledge of financial assets such as stock and bonds, risk and return, and risk diversification. While a study by Mokhtar et al. (2018) on 2,000 respondents from a more diverse background shows that Malaysian possess an inadequate understanding of the risk and investment. A more recent study by Hamid and Loke (2021) support the argument that financial education and behavioral intervention that inculcate good money management skill are important in shaping individuals' behavior.

If we look more closely at youth in Malaysia, Ab Rahman, Tajudin, and Tajuddin (2018) note that the study there are many studies in other countries that projected alarmingly low financial levels among youth, however, they highlighted a limited study in Malaysia, thus the needs for the researcher to explore more on this subject. Yong and Tan (2017) highlighted the strong parental influence on youth's financial behavior. Yet another similar finding by Bakar and Bakar (2020) suggested that financial attitude, parental financial socialization, and financial literacy have a positive and significant relationship towards prudent financial management practices.

This finding is critical since youth that comes from the low-income group may be vulnerable to being influenced by less-exposed parents on financial subjects, thus may hinder them from selecting informed decision making when it comes to managing money. In another separate study, Ariffin, Sulong, and Abdullah (2017), Ergün (2018), and Jennifer (2021) highlighted the significant influence of peers on youth towards improving financial literacy. As people do not have much control over parental influence, we can utilize the role of peers to improve financial literacy among youth for better financial management practices. Thus, the need for a more aggressive, structured, effective, and sustainable way to conduct a program that can penetrate the community and transfer the knowledge more effectively.

As a lesson learned from the past, the transformation of a particular country and community does not happen overnight; and not through a one-man show, or even a one-ruled utopian government. Sustainable development should be able to mobilize every individual in the community and the country to work together toward the common

goal, in this case, a more economic-sustained lifestyle for every individual towards all SDG initiatives laid by the United Nation. The role of each individual may differ, but the response must be shared. As such, the utilization of abled students to become active participants in the development of the community should be taken into strong consideration.

Agurto *et al.* (2020) have utilized students in Peru to improve the surrounding community towards the digitalization era, in their case, the improvement of acceptance level towards the electronic wallet. They found that students involved in this program are more empowered, have better self-efficacy, and motivation, and improve their community engagement. De Hooge and van Dam (2019) also shared a similar sentiment in which they believe that students can become a driver to reach out community through sustainable programs. While Monico and Kupatadze (2020) introduced the concept of the co-teacher and co-mentor model through student-teacher-community partnership, with global aims to empower students to become active participants in community development. These active engagement programs are normally referred to as experiential learning.

A business school at John Hopkins University, for example, has utilized its connection with international partners to sponsor their experiential learning through service-learning activities, in which students engaged in projects that focus on business leadership in culture, conflict management, and team management. Their learned theories in class are transferred into a community with the support of these funders (Calvin & Igu, 2019). Ellenbogen (2017) also notices that this concept will improve understanding and relation between the three players involved – the student, community, and instructor. In the Philippines, a service-learning mechanism enable students to become more empathetic towards the elderly through the programs that they are actively involved in (Anorico, 2019). The findings of Latib *et al.* (2017) suggest the improved soft skills, such as communication and leadership, among students engaged in service-learning.

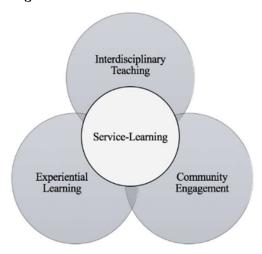


Figure 1: Triad model for service-learning pedagogy (Source: Culhane et. al., 2018)

A program such as this also improved the positive image of the university and able to become an agent for social change. In this study, we aim to utilize the service-

learning pedagogy by constructing a personal financial literacy program through a service-learning program under one of the mathematical courses in the university to ensure the continued sustainability of this program in the future. Prior, a smaller program has been conducted to see the feasibility of the program, though it is a one-off program, thus the impact cannot be effectively captured.

# Methodology

We embed a service-learning program under one of the mathematical courses (SQQM3024 Mathematical Modeling) in the university. This course is selected since it is one of the main subjects that need to be completed by BSc (Hon) Business Mathematics students and is normally enrolled by students in their final year, thus sufficient maturity in STEM-based knowledge is expected. We adopted and realigned the research phases of Thamwipat *et al.* (2018) to coordinate with the restriction of the current movement restriction and online limitations.

Table 1: Research phases adopted from Thamwipat et. al., (2018)

	Phase 1 Conceptual survey and community demands	Phase 2 Development of PBL- 3R activities	Phase 3 Evaluation of the activities	Phase 4 Satisfaction and learning achievements
1.	Related ideas and concepts were gathered.	1. Creating media and training 30 undergraduate students to create content online.	1. The content of the activity is formally assessed through the course's requirement using a rubric.	Reflection     among     participants is     recorded and     analyzed.
2.	Engagement with relevant parties for issues and suitable content.	2. Building smaller groups of students to cater to the needs of movement control.	2. Delivery and implementation are assessed through the course's requirements via a rubric.	2. Reflection among undergraduate students is recorded.
3.	Aligning key components in SDG, STEM activity, and	3. Several phases of discussions (instructorsstudents) on		

	community needs.	content development.	
4.	Adopting ExDiD (Explore, Discover, Develop) method to develop content.		
5.	Identifying the targeted community.		

In this program, four university students served as mentors and 12 young adults as participants. Since the program is being conducted during the movement restricted order, a personalized program is arranged with 10 participants from different universities in their undergraduate studies, and 2 participants from industries. The program focuses on young adults (ages ranging from 18 to 25 years old) as this group of people is critical to be equipped with financial literacy. They are the target participants since most of them are starting to enter the job market, managing education loans, and building new family life. Thus, early financial education should be embedded in responsible finances as their lives progress.

The activities are constructed based on the following structured methodology (Ibrahim *et. al.*, 2020):

Table 2: ExDiDD methodology

Explore	In this phase, the students need to understand the scenario given to them. They have to brainstorm (mind mapping or drawing) the idea to move further.
Discover	While in this phase, the students start to enumerate several examples to see a pattern of the solution. This stage is very crucial to make sure students engage in discussion and ignite their curiosity to find the solution.
Develop	In this stage, the students construct a formula, model, or procedure for the scenario given to them.
Deliver	The activity is ready to be conducted in the communities using the prepared module in the previous steps.



Figure 2: ExDiDD framework

This framework is a systematic process to plan and create meaningful and applicable community outreach programs for a society that integrate elements of creativity, connectivity, and collaboration (Ibrahim *et al.*, 2020).

#### **Results & Discussion**

This section explains the result through one example of an activity conducted during the service-learning program.

Sample Activity: Project Managing Personal Wealth by Excel Budgeting

In this activity, students are given a financial literacy theme, in focuses on young adults. Due to movement restrictions in Malaysia during the Covid 19 pandemic, the activity is conducted via an online platform. The goal of this activity is to empower participants to take control of their finances more effectively. Through this activity, participants can create a personalized table in Excel that relates to their budgeting. They are also exposed to automate calculations for loan repayments, amortization, and credit card utilization. Microsoft Excel is utilized to make use of readily available and familiar software. These goals are being fulfilled through three small activities – Budgeting, Time Value of Money, and Amortization. This activity involves a small group of participants that consists of 12 people, to ensure the effectiveness of the content delivery, as this delivery is a hands-on program.

# Phase 1: Conceptual survey and community demands

During this phase, the class facilitator acts to coordinate potential topics that can be conducted with known limitations during the movement restriction landscape. In this session, several brainstorming activities are conducted between the stakeholders involved. Discussion with students is conducted to align logistic matters and potential threats of running the program. During this time, the severity of Covid 19 has hit the country, not only on the risk the medical health, but most severely on the socio-economic landscape. Thus, a countermeasure to prepare the younger generation for more sustainable personal finances management should be made a priority. In line with the current phenomenon, the demand of the community is aligned with the current syllabus in class, matched with students undergoing the Business Mathematics program.

## Phase 2: Development of PBL-Financial Literacy activities

The ExDIDD model (Haslinda *et al.*, 2020) was utilized as a framework for carrying out this activity. This model comprises four components which are: Explore, Discover, Develop, and Deliver. A brief description of each component related to sample activity is given as follows:

Explore		
	5W1H	Explanation
	Why	COVID-19 causes an economic downturn resulting
		in many people experiencing financial issues.
	What	Teach personal finance management class. From
		the class, people will know how to manage their
		wealth and prioritize their needs.
	Where	Because of COVID-19, this program will be
		implemented personally by facilitators located in
		different regions.
	When	The proposed date is on November weekends. But
		the actual date will need to adjust to participants'
		working period and lecture period, with also the
		government's restrictions.
	Who	The potential participants would be University
		students, College students, and Fresh graduates as
		we wish to spread awareness for them when they
		are young.
	How	The program can be conducted by using Cash Flow
		games, excel workshops.
	1	

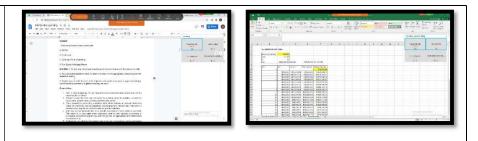


	Figure 3: Brainstorming activity during the explore process		
Discover	7:0		
	Title	Explanation	
	Available Programme	Online workshops/training/seminars/talks are the program that is currently used by government or NGOs to spread awareness on financial management. This is much better than attending physically because the participants no need to face traffics when traveling to the location.	
	Resource	The available sources are social media platforms and online platforms, such as Facebook, Google, Blogger, YouTube, and many more. This is the fastest way that can share knowledge without attending physically and at a low cost (or no cost).	
	Limitation	Several time constraints need to consider such as both trainer's and participant's available time. This can be settled by making an appointment or having preregistration before the workshop to gather the approximate number of participants who are interested to attend the workshop.  Conducting an online workshop does not effective as face to face workshop. This is due to a lack of interaction between both parties. Besides, the content planned may not be fully interpreted in the workshop to ensure the participants obtained 100% understanding rather than a	
	Measurement	bunch of knowledge.  There are 2 ways to measure the success of the workshop  1. Exercises/practices during the workshop  2. Survey form feedback from the participants	
	Participants	We selected participants aged 20 – 25, which are mostly pre-University students, Undergraduates students or Fresh Graduates is because this is the age which suitable need to start planning wealth to prevent financial problem in the future.	
	Effective Programmes	Participants will gain knowledge on how to manage their cash flow and understand several financial instruments available that can use to manage their wealth.	

#### List of Car Loans (Bhd, 2020)

Hong Leong Bank Car Loan	3.24%, RM598
CIMB Bank Car Loan	2.85%, RM582
Bank Muamalat Car Loan	2.95%, RM586
Bank Islam Car Laon	3.00%, RM588
Am Bank Car Loan	3.05%, RM590

#### List of House Loans (Sdn, 2020)

Bank of China Housing Loan	2.85%
HSBC HomeSmart	4.5%
Maybank HouzKEY	4.25%
Ambank Home Link	3.25%
Ambank Home Loan	3.25%

Figure 4. Retrieved information for content development during discover process

## Develop

Because of Covid-19 constraints, it is suitable to conduct a workshop on an online platform to prevent a crowd of people in a confined space. Several platforms that can be used are Webex, Zoom, and Google Meet as these platforms are cost-free.

As using an online platform, conducting financial modeling excel class is suitable as it can share financial knowledge and teach participants on making personal budget sheets, and the participants are also exposed to several excel functions like amortization tables.

#### Part 2: 'Understanding Time Value of Money'

a. Interest

The purpose of this section is to introduce the power of compound interest in saving and investment. This section will introduce the manual calculation and by using excel function.

Principle	
Interest Rate	

	Simple		Compound	
Year	Principle	Interest	Principle	Interest
0				
1				
2				
3				

b. Future Value, Present Value

The purpose of this section is to introduce the concept of time value of money. This section will introduce the manual calculation and with excel function.

# Figure 5: Excerpt from activity content during develop process

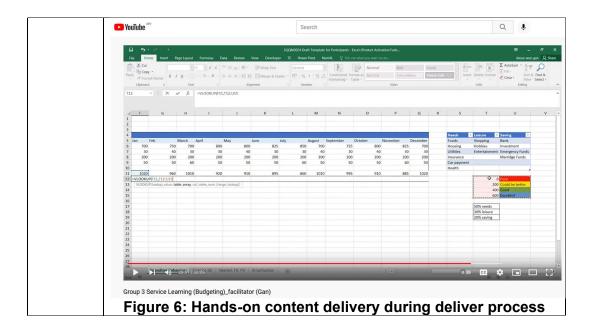
# Deliver

The way to deliver the program are mainly these two ways:

- 1. Communication: Although we are using an online platform, still need to have interaction between the facilitators and participants in explaining the concepts.
- 2. Visual aids: Visual aids acts as a medium to assist facilitators in explaining concepts. The visual aids that can be used are excel as participants can do hands-on practicing exercises.

# Procedure:

	ure:		
STEP	EXPLANATION		
1	Each facilitator will approach 2-3 participants to conduct the workshop. The workshop will be done either face-to- face or using an online platform (such as zoom, or Webex).		
2	In the first part, participants will be asked to list out their income and expenses, and respective pie charts will be generated to display their expenditure behavior by using excel. In this section, they will adjust their expenses with the 50/30/20 rule of thumb to get an idea of how to control their cash flow to prevent a deficit in their cash flow.		
3	In the second part, participants will be exposed to several financial modeling functions. Participants will calculate interest, future value, and present value manually and use the excel build-in function. Then, participants will use this knowledge to construct an amortization table. This is to let participants gain knowledge about how the instrument runs and also learn about some excel functions.		
4	Participants will be given some exercises to test their understanding. The questions and Answers section will be conducted.		
5	Participants will give feedback on the workshop.		



Phase 3: Evaluation of the activities

Students will be evaluated based on the success of the conducted activity. Assessments are based on staggered phases, involving the preparation of the modules during activity and the reporting after the activity has been successfully implemented. Rubrics for each of the phases are given to students before the implementation of the activity to ensure that all components are taken into consideration. Students are also encouraged to prepare a feedback platform for participants for future improvement on deliverables. For participants, a quiz is prepared during the program, and feedback is also obtained at the end of the program.



Figure 7: Assessment rubrics

## Phase 4: Satisfaction and learning achievements

Reflections from students and participants are captured throughout the activity. The following sample reflection is obtained from Sample Activity 'Project Managing Personal Wealth by Excel Budgeting'.

# a. Reflection among participants

Based on the feedback given by our participants, it can be concluded that the participants think that budgeting played an important role in making themselves succeed in the future, especially in their own goals and better lifestyles. Participants are also more aware of the need to create budgeting, understand the critical need for having an emergency fund, and utilize readily available software (MS Excel) as a tool to manage their finances. Applying this knowledge, it will help them to achieve their desires more easily. Figure 6 shows some feedback from participants.





Figure 8: Feedback from participant

All the facilitators have engaged in their tasks successfully during the implementation of activities. This can be proved when looking through feedback from the participants, the facilitators have grown their interest and they are now more tended to learn more for future applications, especially for the Excel formulation. Besides, it is noticed that all participants have provided positive feedback towards the program and also obtained good marks in the small quiz. This has shown that the participants had gained awareness and knowledge about financial budgeting and financial terms after attending the program. After attending the workshop, most of the participants are saying that this program is good and showed interest to join a similar program.

#### b. Reflection among facilitators

Facilitators found that in the early session (understanding cash flow), the content is easy to explain as it only involves simple calculations and graphs. From the facilitator's view, most participants can define budgeting and know well the importance of budgeting. The participants can make their budgeting and generate the pie chart by themselves. The facilitators did not spend too much time explaining this part.

# Strength:

This workshop helps in introducing financial knowledge to the non-finance students and gives exposure to the students to several financial instruments. In this workshop, only several instruments were introduced which are more related to students which are PTPTN loan, car loan. and housing loan, rather than introducing stock market, bonds, future, and options which are more complicated in terms of finance. Facilitators can explain these instruments in a way that is more easily understood by the participants than the speakers, usually, the speakers will use more professional terms and words, which will make the participants hard to digest and understand.

#### Weakness:

Facilitators are fresh in teaching finance knowledge, hence the facilitator is not able to explain fully how the instrument runs as they have not gotten in touch with these instruments. Besides, due to the comprehensive formulation, some facilitators may also make some mistakes such as lack of a specific term during the delivery of knowledge.

# **Opportunity:**

The interest to know more about financial knowledge has increased during this pandemic. Mostly, students from other faculty (example: sciences) are not familiar with financial knowledge. From this, facilitators can direct contact with same-age participants as the financial knowledge needs to be taught as early as possible. Facilitators can share their knowledge with their peers as these are the people that can be contacted easily by them.

### Threat:

There were many online workshops/seminars available which were conducted by professionals and these people are much experienced than the facilitators. The professionals come across a variety of fields such as financial planners, bankers, brokers, Chartered Accountants, etc. These people can answer the audience's questions and give better suggestions on their financial planning.

Figure 9: SWOT analysis from sample activity

In the second part-session (understanding the time value of money), the content is more challenging than in part 1 as it involves more technical function and calculation, especially in amortization tables. Some of the participants are new to this topic and need an extra explanation for them. For beginners, it is also quite hard to learn these excel functions in a short time. Facilitators spend more time in this part clearly explaining the formulas. Participants found a mismatch between tentative programs versus real-time. More time is needed when explaining technical hands-on programs using the online platform. However, the participants can understand the purpose of this workshop and be able to gain knowledge from this workshop.

Facilitators identified that they needed to improve themselves in both studying extra knowledge and teaching participants. Facilitators found that conducting the workshop online is not easy, on the technical concept that needed to be explained.

There are some gaps in knowledge and coaching techniques that have been identified as factors to improve in a future program.

#### Conclusion

In this program, the personal financial literacy program is delivered through a structured program such as service-learning activity. Among the hands-on delivery include the knowledge of cash flow management, simple financial modelling functions, future and present values, and amortization table. This program has the potential to be utilized as a platform for outreaching the community more sustainably as the subjects are available every semester, thus a more impactful outreach program can be made possible. It also develops a significant experience and beneficial knowledge for both stakeholders involved, i.e., university students, the university, and the community. Students can learn the importance of understanding the knowledge and improve soft skills on effective delivery of information, as well as communication skills. They can systematically create content that is structured and accessible to the community. This development requires effective communication skills among team members, the exploration of data, brainstorming ideas, and lastly, the delivery. While for participants, they learned new knowledge other than their current studies and work.

Facilitators understand the need to find ways for effective communication while conducting online hands-on technical knowledge. They learned that engaging in a community outreach program provides a platform to deliver their content knowledge into action for the betterment of the community. They wish to learn more in the hope to deliver better in the future. Participants are also more aware of the need to create budgeting, understand the critical need for having an emergency fund, and utilize readily available software (MS Excel) as a tool to manage their finances. Although some participants are having difficulty with the calculation, in the beginning, they begin to follow the lesson as the program progresses. It can also become an effective medium to bridge the university and community toward a more empowered community. Service-learning acts as a good platform for students before they are involved in society.

The feedback from this program is captured throughout the program. The question 'Do you think budgeting is important? Why?' was asked before the program, and 'Is this program helpful for you? Why?' was placed in the end. Participants are also asked for a recommendation for the betterment of the future program. Throughout the hands-on session, a thorough walk-through was also being religiously conducted to ensure the level of understanding among participants was satisfactory.

Moving forward, a more comprehensive service-learning framework that involves more stakeholders and funders will be an answer for the empowerment of the community, in particular in improving financial literacy among fellow Malaysian. Thus, a more structured and improved service-learning framework should be developed to ensure a holistic approach and interconnection between stakeholders can be fully capitalized.

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