
Financial literacy education and high school students – overview, analysis, suggestions and implications

Chen Tian*

WES Group Pte Ltd.,
11F, North Tower, Shanghai Stock Exchange Building,
528 Pudong Nan Road, Shanghai, 200120, China
Email: chentian@wes-group.org
*Corresponding author

Chunhui Wang

School of International Trade and Economics,
Shandong University of Finance and Economics,
40 ShunGeng Road, Jinan, Shandong, 250014, China
Email: sunnywangchunhui@163.com

Abstract: Financial literacy education is essential for improving high school age students' financial wellbeing by instilling and developing awareness, knowledge, skills and attitudes of financial matters. This study analyses the importance and implications of financial literacy education by providing: 1) an overview of four countries' high school financial education and through empirical analysis; 2) identified the importance that financial literacy education plays in improving personal financial capabilities; 3) raised helpful suggestions to improve the outcomes of financial literacy education; 4) ends with a discussion on the implications of high school financial literacy education.

Keywords: financial education; financial literacy; financial behaviour; implication assessment.

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Biographical notes: Chen Tian is the Chair of the Board of WES Group Pte Ltd. and Principal of Changsha WES Academy (an international school) under WES Group. He used to work with Citigroup, Royal Bank of Scotland, etc. and has profound experiences and practices in finance as well as education industry. His research fields focus on financial educations.

Chunhui Wang is a Lecturer in School of International Trade and Economics at Shandong University of Finance and Economics. Her research interests cover technology innovation, international trade and international technology diffusion.

1 Introduction

Finance to economics is as technology to science. That said, the subject of finance is taught more as a separate subject for university aged students (commonly aged 18years+) rather than a separate subject for high school aged students (commonly aged 14–18 years old). Although it must be noted some curricula provide separate subjects that contain financial topics; such as economics, accounting, business and commerce in various High School curriculum's, be it the UK's iGCSE/Alevel or BTEC, the USA's AP, Switzerland's IBDP, Australia's HSC, or New Zealand's SC. Even so, it appears these subjects cherry-pick finance areas for their own curriculum such as currency appreciation (economics), double entry bookkeeping (accounting), company cash flow (business), bank reconciliation (commerce) and even FOREX calculations (maths) Therefore it is argued that High School students may, at aged 18, have only experienced a small specific area of Finance rather than gaining broad Finance knowledge, especially when considering that High School is preparing students for their personal and working and financial future.

Financial literacy was defined as “a combination of financial awareness, knowledge, skills, attitudes and behaviours necessary to make sound financial decisions and ultimately achieve individual financial wellbeing” (Atkinson and Messy, 2011). This key definition become one of the foundations of the OECD's Future of Education and Skills 2030 project that recommended designing Finance programs using well-defined core competencies, that will take place in schools (OECD, 2020).

High school students have normally completed primary education and are still in the education system and aiming for either employment or future higher education. Either way, high school students at aged 18, are commonly considered adults and responsible for their own personal and financial actions and this gives rise to three questions.

- 1 If the high school student leaves education to take a job or start a business, then besides some specific areas in one or two subjects how confident can they be when apply financial knowledge?
- 2 If the high school student enters university taking a finance course then, besides some specific areas in one or two subjects, where is their basic introductory finance knowledge?
- 3 If the high school student enters university taking a non-finance course then, besides some specific areas in one or two subjects how can they apply financial knowledge to their daily lives when money going out is often more than money coming in?

Hence, it is proposed that before high school students leave and enter either university or the working world they should have been taught sound financial literacy skills.

The rest of the paper is organised as follows; Section 2 provides a literature review. Section 3 briefly overviews the development of financial literacy education in four countries. Section 4 discusses the current situation regarding financial literacy education in China. Section 5 uses empirical analysis to identify the effectiveness of financial literacy education. Section 6 provides suggestions for improving the design and delivery of financial literacy education. Finally, in Section 7, conclusions are made with brief discussions regarding the contribution of this study and possible limitations.

2 Literature review

Current literature has shown that financial literacy levels in high school students is rather low with students lacking basic finance concepts (Beal and Delpachitra, 2003; Lusardi et al., 2009; Lusardi and Mitchell, 2011). However, Mandell (2006) goes further holding a worrisome opinion that since the late 1990s youth financial literacy in the USA has actually been declining.

This is indeed problematic and can affect the wellbeing and happiness of students. With Wang and Yang (2014) noting this through their research on the relationship between financial education, financial literacy and financial behaviour. They think financial education affects financial literacy which affects financial behaviour which affects happiness levels.

Previously, Beverly et al. (2003) studied the connection financial knowledge has on financial behaviour finding a positive relationship between financial knowledge and financial practices such as saving. Furthermore, other studies found an inverse relationship between financial literacy and happiness and a lack of financial literacy on big financial pressures causes unhappiness (Lusardi and Mitchell, 2011; Marcolin and Abraham, 2006). Therefore, financial literacy has close relationship with financial behaviour and positively affects happiness levels.

As to financial literacy on investment behaviour? Calvet et al. (2007) confirmed that a family with higher financial literacy can perform stock investment more easily. Again, good or adequate financial literacy knowledge implies happiness from good financial investing with Rooij et al. (2007) finding the higher the financial literacy is, the higher the chance of benefiting from stock trading is. Hence, there is a loose connection here that higher financial literacy = higher financial returns = higher success and possibly happiness.

As to financial literacy on credit behaviour? Low financial literacy was found to lead to higher cost of credit products (Chatterjee, 2013; Disney and Gathergood, 2011) and over-indebtedness (Sevim, 2012). This, undoubtedly, leads to unhappiness and to stop this occurring Meng et al. (2019) argues that increasing in financial literacy decreases high-cost credit behaviour. Although, this cause and effect statement is contentious because a direct correlation of the affects of financial literacy and financial behaviour is less certain with Willis (2011) holding the opinion that increasing financial education provision does not achieve effective outcomes. Although Willis does appear to be in the minority as most literature argues that financial literacy and finance education measures are effective (Chatterjee, 2013; Disney and Gathergood, 2011; Lusardi and Mitchell, 2014; Sevim, 2012).

As to financial literacy on the effects of financial education in youth? No solid conclusion is reached has been confirmed. On one hand, literature has reported positive change on financial behaviour after learning a finance curriculum (Danes, 2004; Lusardi and Mitchell, 2011; Varcoe et al., 2005; Walstad et al., 2010). Yet, on the other hand, other researchers have noted high school finance courses has no significant impact on financial behaviour (Mandell, 2006). Whilst using a difference-in-difference approach, Douglas et al. (1997) showed that financial education affects future savings significantly. However, applying the same method with a larger sample, Cole and Shastry (2009) found little impact of financial education on future saving levels. Also with a difference-in-difference estimate, Becchetti et al. (2011) found no significant effect of financial education on financial knowledge. Although just one year later, Becchetti and Pisani

(2012) extended the sample finding positive effects with the same method. These contrasting results show us that further research on the effects of financial education in youth is required.

Even so, Tim and Lukas (2017) concluded that financial education helps increase students financial literacy. Interestingly, the effectiveness diversified among different target groups and for low income group, the impact is much smaller. Although socioeconomic factors can be mitigated through deep-teaching and what's more, the higher the intensity of financial education is, the bigger the positive implication (Rooij et al., 2007). This leads us back to one of our original questions and besides some specific areas in one or two subjects how can post high school students apply their financial knowledge? Especially when high schools may not deliver high-intensity or dedicated long-term financial literacy education? Although Tim and Lukas' (2017) important conclusion was about the timing of finance education, rather than its impact on socioeconomic groups. They suggested the way to make positive effects – that is to provide the financial education – is to provide it at a 'teachable moment'. However, this can be argued about any form of education; when is the 'teachable moment' for A for art education? When is the 'teachable moment' for Z for zoology education? Still, is the 'teachable moment' for F for financial literacy education in high school and is this the right moment to receive financial education?

The answer is yes. Especially as, over the last seven years awareness of financial education benefits growing. The US Consumer Financial Protection Bureau in 2013 recommended introducing financial education to the entire K-12 school curriculum's. During which time the UK, Australia, Brazil and India also took measures to implement financial education at high school. After almost four years of research, the OECD and its INFE (International Network on Financial Education) issued OECD-INFE guidelines for financial education in schools. (OECD, 2012) Firstly, before introducing financial education, the existing courses and students current financial literacy level should be evaluated and analysed which can check prior knowledge and give schools an appropriate starting point. Secondly, to ensure long-term sustainability of the project, public leaders or finance czars and collaborative organisations should be appointed at the national level. Thirdly, a financial education learning framework should be created that includes knowledge and understanding, skills and behaviours, attitudes and values and entrepreneurial skills. Finally, evaluation methods and standards should be established that include monitoring each stage of project implementation, qualitative and quantitative evaluation of short-term results and long-term impact, so as to constantly improve the effectiveness of the project and its different participants at every stage.

In summary, the affect financial literacy has on high school students borders on inconsistency with some studies finding a positive relationships and other studies finding none. However, the OECD-INFE leans towards overall positive affects and accepts that financial education improves financial literacy and financial behaviour. Although, it is concerning that there are so few studies on impact (positive or negative) of financial education for high school students in China. Hence, this study has brought the need for high school financial literacy education and for more studies on its effectiveness in to the spotlight.

3 High school financial literacy education around the world

3.1 The development of financial literacy education in the USA

After the 2008 global financial crisis the Federal Reserve created a financial literacy office to lead the popularisation of financial literacy for the public. To assist the American people in understanding financial matters and to answer their questions, the office, with help from the President's Advisory Council on financial literacy gathered together and supported a team of volunteers. They also implemented the financial literacy and Education Improvement Act which established a financial literacy and Education Commission which, in turn, developed a national financial education strategy and formulated a series of standards for evaluating the effectiveness of financial education.

3.2 The development of financial literacy education in the UK

The UK government attaches great importance to the popularisation of financial literacy for young people. The government and the education department have joined forces to implement financial literacy education and include financial literacy in a broad spectrum of student textbooks to enhance their understanding and management of finance. To facilitate learning of financial knowledge, a software package related to financial literacy has been specially developed to help young people understand financial updates in real time. The UK has also established a number of 'currency museums' in various regions of the country to communicate financial literacy, attracting many young people to learn about finance and the daily affects of their lives.

3.3 The development of financial literacy education in Australia

The Australian government pays great attention to financial literacy education. Led by the government, the official organisations including Australian Securities and Investment Commission (ASIC) and Australian Stock Exchange (ASX) play an important role in financial education and training. Australia's first national financial literacy strategy was jointly formulated by ASIC and relevant domestic financial institutions. Currently, this strategy has been included in various Australian High School subject textbooks. Although ASIC has since evaluated the strategy and set out the objectives for next phase, laying a solid foundation for the popularisation of financial literacy in the country and it is expected to develop a mandatory course for Australian teenagers in the future.

3.4 The development of financial literacy education in Japan

Japan formulated its national financial literacy strategy back in 2005. Since then, it has supplemented and improved the strategy several times based on its own economic development. For example, Japan has set a goal of promoting specific financial literacy for students. This strategy has incorporated financial literacy into the courses of different grades and stages of universities, middle schools and elementary schools, thus popularising and enhancing financial literacy education through class teaching. In addition, Japan has established a Central Council for Financial Education with branches in local administrative regions that work closely with the Ministry of Education to provide students from elementary to High School age with financial literacy education

through a variety of ways: such as textbooks, learning materials and financial literacy education seminars. Furthermore, Japan has made full use of the internet for financial literacy promotion, establishing a government-led specialised financial literacy education website for the public to access, learn and research about the latest financial trends in real time.

3.5 The role of independent financial institutions in the financial literacy education

Many forward-looking financial institutions take part in the financial literacy education. Accepting that there are concerns over conflicts of interests that might incur, the general initiative of those financial institutions appears to be mostly for social awareness and corporate responsibility with most activities being non-for-profit programs operating on charitable basis. From the many activities to choose from, this study has identified two representative cases: Vanguard Group, one of the largest fund management company in the USA and Industrial and Commercial Bank of China (ICBC), currently the largest commercial bank in China.

Vanguard group – my classroom economy

Vanguard Group promoted the MCE (my classroom economy) is an innovative approach to financial education. Unlike most other traditional financial education programs based around lesson plans MCE applies experiential delivery. Teachers establish a classroom-based economy that integrates into the school day as a classroom management system.

The MCE program provided by the Vanguard Group targets all grades K12. The program simulates an economic environment where students earn or spend ‘dollars’ under the guidance of teachers. When teachers assign a task, the students goal is to earn money from it by buying items for it and receiving income from it. The teachers can also award or fine the students ‘dollars’ for specific financial behaviours and attitudes.

After the 10 week course students in MCE classrooms have been shown to gain improvements in financial knowledge and financial behaviour. These positive impacts are statistically significant based on a sample of 1,972 students across 24 schools with students who have experienced the MCE program more likely to have bank accounts and involve themselves in financial activities. Therefore, these results indicate financial education delivered to high school students may be positive for the increasing their financial literacy.

ICBC – spark classroom

As a well-know and leading state-owned commercial bank in China, ICBC implemented financial literacy education under the general principles of ‘inclusive finance’, under-which one target is to promote financial capabilities across all school levels. To achieve this ICBC created ‘spark classroom’ which is a bespoke program used to deliver and assess financial education of secondary school students.

The spark classroom has special goals combining corporate social responsibility and the central government’s policy on enhancing integration of industry and education, to popularise financial education ultimately making it a social custom to want to learn it and

want to learn more. This program assists schools to meet student financial literacy needs by providing total curriculum design, teacher training and teaching resources. The program is also strengthened by offering ‘online + offline’ financial literacy education sessions and activities for high school, primary school, early years and the public at large.

The spark classroom has also developed a series of online finance courses for students whom have complete the initial program with updated resources on finance areas and topical financial events. This ensures continual learning occurs, with the whole package of courses (issued in both Chinese and English languages) lasting 130 lesson hours.

4 Current situation of China’s high school financial literacy education

China has entered a stage of economic prosperity and is now facing an economic transition from manufacturing industry towards service sector, which is considered to be a retail and finance sector. As a result, China’s regulators are attaching increasing importance to financial literacy education for young people. At the G20 Summit in June 2012, global leaders endorsed the high-level principles on national strategies for financial education, which is a series non-binding international guidelines and national strategies for providing financial education that individual countries can use.

Usually, a co-coordinating public leader or non-authoritative entity at national level is required to ensure the relevance and long-term sustainability of the financial literacy education progress. Although, in China, it seems the financial governing body has more involvement in this task than educational administrators. In 2013, the national strategy for financial education in China was created via four partners; the People’s Bank of China, the China Banking Regulatory Commission, the China Securities Regulatory Commission and the China Insurance Regulatory Commission. At present, the People’s Bank of China and the three Commissions have established their own consumer (investor) protection department to regularly organise public sharing sessions such as ‘financial knowledge promotion month’ and ‘sharing financial knowledge with common households’. This ensures the financial education is expert driven, professional and standardised.

However, since the major target of China’s educational departments is university entrance, less attention has been drawn to teaching and delivering financial literacy education, especially in less developed regions in the country. Thus, it can be argued most of China’s educational departments purpose of existence appears to be to channel students down a standard university entrance exams one-way street with little regard to the wider skills that high school students should develop. This myopic view and planning failure may result in knowledge fragmentation. Consequently shallow financial education is acquired by high school students, which then diminishes the goal of popularising financial knowledge. Therefore, small-scale and piecemeal inclusion of financial education in different subjects, insufficient resources and misguided social attention, have made it difficult to extend the practice of financial education to a wider range. Therefore, China still lags far behind other advanced countries in the practice of incorporating financial knowledge into classroom. However, steps are being made in the right direction and below discusses the construction of two educational institutions in China that have made great progress in financial literacy education curriculum design.

4.1 *The construction of the finance-featured curriculum in Shanghai Dongchang High School*

Dongchang High School affiliated to East China Normal University, is located in Lujiazui financial zone of Central Shanghai near the Shanghai Stock Exchange and well known financial business. In 2009, the East China Normal University decided to make ‘cultivation of financial literacy’ a key feature and after ten years of developments the Dongchang High School stands out among the few financial featured schools in Shanghai.

The Dongchang School made financial literacy the priority for curriculum development for popularising financial educations among students. Since 2009 the school has been continuously working on its school-based textbooks and curriculum with ‘financial literacy’ running as the core competency across all subjects and to date Dongchang has developed 24 core financial education courses. *Taking The World is a History of Finance* course as an example; students learn language, politics, history and financial literacy in multi-disciplinary interactive learning, thus broadening and deepening their finance learning in detail, rather than token mentions in a few unrelated lessons.

These core financial education courses were developed and revised by 16 teachers of the school’s financial feature teaching and research group after discussing with financial experts. Crucially, these teachers came from a multidisciplinary field and taught different subjects such as Chinese, mathematics, physics, history, psychology and information technology. Almost none of them has financial background, which aided the process as the teachers became the first students and were learning whilst planning because the process of developing the courses is also a process of learning and planning. In 2018, the teachers of the group independently developed five finance based MOOCs such as ‘risks around us’ which were shared on the ‘Shanghai High School MOOC platform’ for all high school students in the city to learn online.

4.2 *The curriculum of economics and financials of Shanghai WES Academy*

Shanghai WES Academy is a high school centre specialising in economics and finance education. Centred on business, economics, accounting, finance and financial investment, Shanghai WES Academy offers opportunities to for high school students and other age groups to learn financial education. Various programs have been developed that focus on, for example; international financial literacy education, entrepreneurship, investment products, personal cash management. The programs are mainly designed for high school students, with the goal of cultivating students’ integrity, rationality, open-mindedness and the combination of knowledge with in-action learning.

For example, two courses are: entrepreneurship course – Young Venturers and the investment course – Young Investors. These are high school based courses that use finance based education to instil and develop the university graduate attributes of hard and soft skills (Slade and Brown, 2020) in high school students and can also be offered to external students and adult learners. The hard skills being; technical skills, acquisition of factual knowledge and numeracy/literacy/ICT skills. The soft skills being; interpersonal skills, managing relationships, people and team working, employability skills, positive attitude and leadership, innovation/creativity and communication and critical thinking. The courses also include a securities investment simulation competition, financial

institutions on-site internships, community financial literacy promotion, summer camps and public service activities. Therefore, instilling and developing financial skills and other skills that are important for students both at university and in their future working and personal lives.

- 1 Entrepreneurship course – Young Venturers (developed in collaboration with Y-CITY) – will help instil and develop learners’ entrepreneurial skills such as identifying business opportunities, pitching and selling business ideas, developing ideas, allocating resources, cash management, leadership and team work skills. The course is aimed at high-school and first year university students. It is complemented by a course book, quizzes, research work, presentations, with many extension and unique homework activities (from case study analysis to presentations, 3D posters, film-genre movies and art and dance tasks).
- 2 Investment course – Young Investors (developed by WES Group) – is a guide to understanding and using different investment products from cash and shares to EFTs and portfolio management, aimed at high-school and first year university students. The course is complemented by quizzes, research work, presentations, with many extension and unique homework activities (from case study analysis to presentations, 3D posters, film-genre movies and art and dance tasks).

5 An empirical analysis regarding the effectiveness of financial education

To demonstrate the effectiveness of financial literacy education in improving personal financial skills, an experiment was conducted in Changsha WES Academy to test the importance of financial education in financial literacy and behaviour. Business and economics were specifically targeted and given an extra once-a-week 40 minute finance course. This course allowed students to understand basic finance and economic and business concepts that closely related to life and thus, lay a foundation for future finance study.

5.1 Experiment procedure

In order to measure the effectiveness of the courses, 200 students regularly attended the course, submitted homework and sat assessments. The 200 students aged from 14 to 18 years old consisted of 96 boys and 104 girls. They participated in the nine-month (one academic year) course from 2019 to 2020.

Before receiving financial education, the students conducted a pre-test on financial knowledge and financial behaviour. After completing the course, they conducted a post-test which has a very similar content with that of the pre-test. After data collection, longitudinal comparisons were made using the post-test and pre-test results.

The Stata software tool was used for data analysis. There are two scales for financial knowledge; perceived and scored; there are four scales for financial behaviour; family discussion, saving behaviour, shopping behaviour and investment behaviour. The specific content of each scale is shown in Table 1 (items of financial education test). To measure perceived financial knowledge and financial behaviour, the answer to each question is based on a 4-point Likert scale of 4 = a lot, 3 = some 2 = little, 1= never. To measure

scored financial knowledge a total of 12 true or false questions were asked with one point for a correct answer and zero point for wrong answer.

Table 1 Items of financial education test

	<i>Scale</i>	<i>Items</i>
Financial literacy	Perceived financial knowledge	When it comes to money issues, I know what to do.
		Scored financial knowledge
		Most people can find at least one way to save.
		All advertisements are real, no one tries to deceive me for money.
		The value of your money will change over time.
		The planned purchase behaviour is impulse purchase.
		If I buy something I do not want, the store must refund me.
		Repaying the minimum credit card bill is a good money management behaviour.
		If you damage your car, the insurance company will pay for it in full.
		Your beliefs and values have little effect on how you spend money.
		If you fuel 10 litres of gas to your car and a litre of gas costs 5 yuan, you need to pay less than 30 yuan.
		Bonds are a safer investment than stocks.
		P2P is without risk.
		Gold is a good asset against inflation.
Financial behaviour	Family discussion	I discuss how I use the money with my family.
		I discuss family finances with my family.
		I discuss the importance of saving with my family.
	Saving behaviour	To save money, I will wait for the online movie instead of going to the cinema to watch it the first time.
		I buy clothes on sale in order to save money.
		I buy group-buying coupons to save money when I go out to eat.
		I will think about how to save money for the future.
		When I get some money, I will save a part of it anyway.
	Shopping behaviour	I will compare prices.
		I will not shop impulsively.
	Investment behaviour	I usually read financial news.
		I buy stocks or funds.

The score of each scale is calculated and analysed on this basis. A significance test was performed on the difference in the average of each scale to analyse whether significant changes between pre-test and post-test have occurred in respondent's financial literacy and financial behaviour.

5.2 Experiment outcomes

As shown in Table 2 (changes in perceived and scored financial knowledge), the results indicate that students believe their perceived financial knowledge has improved significantly from an average of 2.51 for pre-test to an average of 2.91 for post-test.

The scored financial knowledge covers savings behaviour, commerce, credit, insurance, capital markets and, etc. As shown in Table 2, the results indicate that students' scores have improved significantly between pre-test and post-test, from 6.22 to 7.93.

Table 2 Changes in perceived and scored financial knowledge (N = 200)

	<i>Mean</i>	<i>Sd</i>	<i>Mean</i>	<i>Sd</i>	<i>t-test</i>
Perceived (pre and post)	2.51	1.15	2.91	0.89	-7.06***
Scored (pre and post)	6.22	3.71	7.93	2.84	-12.14***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3 (analyses of financial behaviour from pre- to post-test) displays the four aspects, which are family discussion, saving behaviour, shopping behaviour and investment behaviour. The results indicate the average score of post-test is significantly higher than that of pre-test and the difference is considered to be significant and shows that after completing the course, the students' financial behaviour has measurably changed for the better.

Table 3 Analyses of financial behaviour from pre- to post-test (N = 200)

	<i>Mean</i>	<i>Sd</i>	<i>Mean</i>	<i>Sd</i>	<i>t-test</i>
Family discussion (pre and post)	7.65	3.07	9.13	2.37	-9.50***
Saving behaviour (pre and post)	12.03	4.83	13.78	4.28	-7.42***
Shopping behaviour (pre and post)	5.00	2.06	6.33	1.59	-9.89***
Investment behaviour (pre and post)	3.53	1.66	4.67	2.08	-10.21***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

6 Suggestions in conducting financial literacy education in high school

Based on our empirical analysis of the pre and post course test results, we have reason to believe this experiment illustrated the importance of financial education has on high school students finance knowledge. Furthermore, the results has created a justifiable case for other high schools to offer the same financial course that had been offered at Changsha WES Academy. Therefore, we propose five suggestions below to effectively promote, integrate and deliver financial education in high school stage.

6.1 Interdisciplinary

The nature of the knowledge elements of finance is that it involves many fundamental academic subjects in normal high school courses: mathematics, economics, history, business management, accounting, citizenship and literature. Previously, this courses

almost stood alone and a few finance terms may appear in their curriculum as a small specific topic in one part of a single lesson. However, the world has moved on with:

- 1 the global financial crash thrusting finance education in to the spotlight
- 2 government, OECD and G20 events discussing finance education at top levels
- 3 the modern trend of innovative learning through new and interdisciplinary courses that give high school students the skills their need for an ever-changing world.

Consequently, it is now a win-win situation for more finance literacy and a need for separate finance education courses is here.

6.2 *Socialisation*

As mentioned at the start; finance is a technology. Finance is a science. Finance is a tool for people to learn to use and apply to their personal and working lives. And, like everything, we must learn how to use the tool and get the greatest benefits from it. As in the case of ICBC of China, financial education is targeted at high school students as well as the family and the society under the theme of financial inclusion and it seems prudent to teach finance education in detailed courses rather than in piecemeal sections in other subjects so that High School students can leave with a sound financial education.

Appreciating the fact that high school students have much involvement in a myriad of financial activities, either by themselves such as buying a school drink, or activities with their peers, families and communities such as buying gifts, starting a small enterprise, or joining and paying for an after-school community class. It seems necessary to educate these students now on financial matters so they can apply their financial knowledge to better their personal, friends, families and communities situation. Examples are infinite, however, financial courses on cash, share and stock trading, profit and loss, auctioneering, overdrafts, bonds, lotteries, cryptocurrencies and even gambling would undoubtedly raise awareness of finance and help educate people on finance before it is too late.

6.3 *Internationalisation*

One beneficial characteristic of finance is that the whole world uses very similar terms and languages. It can be argued most people in the world recognise their countries currency and the cash notes from major countries. There are stock markets in almost all major economies in the world and countries and people use the same valuation methodologies and based on the same generally accepted financial or accounting definitions. Hence, finance education is an 'international education' and a modern tool that crosses countries and circles the entire global. As such, there are less risks of 'lost in translation' and more opportunities for financial education courses in China to become financial education courses in other countries.

International collaborations among various pedagogical programs from different countries and regions should be advocated. It is a benefit of globalisation and global security for students all over the world to understand other parts of the world and to share experiences. Hence, finance education can help unite and show practical common ground between countries, for example with simple topics such as FOREX to the unregulated markets of cryptocurrencies.

6.4 *Economical evaluation*

Economical valuation of financial literacy education effectiveness is key for government, institutions and schools as a monetary figure helps balance relative budgets and justify its delivery. The parameters of economic evaluation can be both quantitative and qualitative. Specifically, qualitative parameters could include, but not limited to, logical and critical thinking ability, financial planning behaviour, financial knowledge understanding and family as well as community financial inclusion activities. Quantitative parameters could include, but not limited to, personal financial goal achievement, financial budgeting effectiveness and empirical evidence of long-term personal welfare (including wealth). Therefore, robust quantitative and qualitative measures set at the start will allow more schools to understand the benefits of finance literacy and implement financial education.

6.5 *Life-long perspective*

The awareness, knowledge, methodology, think model provided by financial literacy education may not be fully deliverable to students at high school stage due to factors such as:

- 1 timetable constraints
- 2 current financial literacy
- 3 cultural pressure to prioritise other subjects
- 4 lack of general awareness regarding the pivotal role that financial literacy will have on high school students' future lives.

The praxis nature of finance means that the students have to combine all their soft and hard skillsets with their future life far beyond just their school life through life-long learning.

Thus, financial literacy education should be implemented through a life-long perspective. In order to fulfil that, all teaching targets and curriculum delivery should be designed to not only meet short-term purpose but also to put that into a life-long horizon. This is a best-fit education system for the future as students' future needs are being cared for today.

7 Implications to have financial literacy education in high school

Obliviously, education during the high school stage plays an important role in students' whole study life. Though it is different among different countries, the High School stage is either the last period of compulsory education or the beginning of education stage immediately following the compulsory stage. During this period, it can be assumed that students are supposed to have acquired basic fundamental knowledge for entry to either university study or work.

Hence, financial education is very important to the student at this age due to:

- Firstly, students are more inclined to be involved in the economic world and face the real-life economic activities; Most of the students will have or have had some control of their own economic resources such as allowance from parents. For example,

students above the age of 16 are legally allowed to work in China. In economic language, High School students are transferring from a cost centre into a budget centre in the family ‘enterprise’ and such a key transference needs financial literacy knowledge.

- Secondly, high school students have probably acquired the critical knowledge needed to develop their financial understandings. They have completed various core subjects such as math and social sciences subjects, albeit at introductory stages. Furthermore, many students may have already begun studying these subjects at advanced levels such as further-math, sociology and economics. These subjects do tend to cherry-pick small finance related topics, hence, students need comprehensive financial literacy knowledge.
- Thirdly, the process of understanding finance knowledge and concepts of the same process of understanding the importance of key values of life: such as integrity, critical thinking, balancing the present and the future, matching risks and rewards. To some extent, those key values of life will be essential to ensure students are ready and can function well in the world outside the educational-ivory-towers, where, on a daily basis, students need to apply financial literacy knowledge.
- Fourthly, high school students face many potentially life-changing choices for their future post-high school careers and lives. Accepting that, as with all subjects, knowledge is gained over time, an early well-planned financial literacy education system could help students look at their future lives whilst considering a financial perspective. Furthermore the logic of finance, when compared to other subjects such as math is equally as important or even more important to the High School student. Such which is more important for a High School student: the knowledge gained in Math from quadratic equations or from Finance and compound interest equations and its relevance for bank overdrafts? Thus, students need a solid financial literacy knowledge.
- Fifthly, as with all high schools, timetabling and what to fit in a student’s study week is crucial. If finance literacy were to be incorporated in a High School weekly timetable then what other subject(s) will suffer? And of course, there is the additional staffing and resourcing costs to consider? Although this empirical study will help to justify the case, school management should further ask themselves ‘what financial mistakes or decisions did I do after high school, that with the benefit of financial literacy knowledge, I would have done differently?’ This answer should be ‘I would have done... differently had I had the benefit of sound financial literacy knowledge’.

In conclusion, this study analysed the importance of finance literacy education as an indispensable ‘real-life’ curriculum for high school students no matter whether they choose finance or economic-related subjects as majors or minors for their future career. By summarising the financial literature education from four countries around the world and drawing from their strategies this study analysed the development of financial literacy education in China. Furthermore, this study conducted an empirical analysis regarding the effectiveness of financial literacy education in improving personal financial capabilities in high school students. Using a repeated measures survey this study has identified and confirmed the effectiveness of financial literacy education in improving

various financial skills. Lastly this study proposes key reasons in support of delivering financial literacy education and discusses its implications.

As with any study, a number of limitations have to be considered:

- 1 This study conducted a one-stage empirical analysis by comparing the results before and after the experiment. In future, multiple-state experiment might be helpful in identifying the duration of the effects resulted from experiment, i.e., the financial literacy education.
- 2 This study focused on the macro aspect of financial literacy education by proving strategic suggestions. In future, more operations suggestions in micro level can be identified in future research, which can help improving the performance of financial literacy education specifically.
- 3 This study focused on respondents who were completing a one academic year long finance course. In future, a larger study could be conducted with many more respondents or the same respondents could be surveyed again with a follow-up study to observe longitudinal change in more detail.

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