INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 14, Issue 5, (2024) E-ISSN: 2222-6990

Enhancing Financial Education in Lower Primary with Concrete Kits and Digital Teaching Apps

Tan Tong Hock[1], Ahmad Fauzi Mohd Ayub[2], Riyan Hidayat[3]

[1]Department of Mathematical and Data Science, Faculty of Computing and Information Technology, Tunku Abdul Rahman University of Management and Technology 53300 Setapak, Kuala Lumpur, Malaysia, [2,3]Institute for Mathematical Research, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia, [2,3]Faculty of Educational Studies, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

Corresponding Author Email: thtan@tarc.edu.my, afmy@upm.edu.my

To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v14-i5/21655 DOI:10.6007/IJARBSS/v14-i5/21655

Published Date: 21 May 2024

Abstract

Money is significant and should be understood and mastered by students since young age. However, students still face difficulties learning and getting the concept of money, especially in today's digital age. Therefore, this study aims to determine the effectiveness of using concrete money learning kits and digital teaching apps in enhancing the understanding of money concepts among second-grade students. The study respondents were 30 students who went through the lesson study using concrete and digital learning kits. The learning process of the concept of money included the introduction of money, operation in using money, exchange of money, and solving daily money problems. Data collection using test instruments was then analyzed using a marking scheme. Data analysis used to test the study hypotheses was paired with a T-test for the performance before and after the lesson study. The study's findings showed that the lesson study conducted successfully improved the achievement of second-year students in learning the concept of money. This study shows that concrete and digital learning kits can help students conceptual understand and promote meaningful mathematical learning. The implication to students is that they can improve their Mathematics achievement on money, especially in this era of e-money.

Keywords: Learning Kit, Concrete, Digital, Conceptual Understanding, Money.

Introduction

Concrete materials play a crucial role in mathematics learning, particularly in enhancing students' understanding and representation abilities. In this era of unlimited information technology revolution, financial technology is rapidly advancing worldwide, driven by the provision and offering of various digital platforms and services. Digital wallet services are an initiative by the central bank to make Malaysia one of the cashless nations, also known as a cashless nation, by the year 2020 through digital payments (Sobrey, 2018). At this time,

society is starting to reduce its reliance on physical currency, such as banknotes and coins, replacing them with digital money (Prebiu, 2019). According to Aisyah and Wajeeha (2016), money is an essential asset that can fulfill an individual's needs and desires. Therefore, the concept of money should be mastered by every individual, especially students who will face an increasingly challenging economy. Students should have a high level of financial literacy to adapt to the growing economic changes (Rubayah et al., 2015). Financial crises can occur if someone fails to manage their finances wisely (Huzaimah & Ahmad, 2017).

All segments of society, including those who are young and borrowing for the first time from financial institutions, should be prepared for financial management education so that they are not burdened with severe debt problems and eventually go bankrupt. The Malaysian Insolvency Department reported 37,493 cases of individuals aged 25 to 44, and 835 declared bankrupts (Paul et al., 2013). This shows that serious attention needs to be paid to young people so they do not continue to fall into debt. In addition, using credit or debit cards that perform virtual money exchange transactions further simplifies daily affairs without realizing it has spent a large amount of money because the transaction does not involve the exchange of money in concrete. Since the spread of COVID-19, cash transactions have declined and may no longer be relevant in this digital age (McCrindle & Fell, 2020). This causes students to see money in the abstract and think of money as a number on the screen only Thompson (2019)

The study by Xu et al (2018) at The University of Illinois found that transaction volume has increased by 2.4 percent while total transaction frequency has increased by more than 23 percent after using digital payment methods. Moneyless payments are predicted to drive global spending, such as credit cards, debit cards, and so on, to 45 trillion dollars by 2023 (Xu et al., 2018). Based on the analysis of student achievement in the Malaysian Primary School Assessment Test (UPSR), the performance of students who have not reached the minimum level in Mathematics is 16.87 percent, showing that primary school students are still unable to solve questions involving problem-solving in the topic of Money (Ministry of Education Malaysia, 2019).

Referring to the Curriculum and Assessment Standard Document, students in Malaysia have been introduced to money up to RM100 as early as year two. Pupils identify the Malaysian currency in the form of coins and banknotes. They were introduced to the basic operations of money and the means of exchanging money. The learning process is vital to improve their level of reasoning in calculating money.

Literature Review

This study focuses on the student's difficulties in learning and mastering the concept of money. Since the spread of COVID-19, cash transactions have decreased, and they may no longer be relevant in this digital era (McCrindle & Fell, 2020). This has made students perceive money abstractly, viewing it as numbers on a screen (Thompson, 2019). Table 1 shows each generational category's birth year and age (McCrindle & Fell, 2020).

Table 1
Year of Birth and Age for Each Generation Category

Category	Year	Age(at Year 2022)
Builders	< 1945	77 and above
Baby Boomers	1946-1964	58-76
Generasi X	1965-1979	43-57
Generasi Y	1980-1994	28-42
Generasi Z	1995-2009	13-27
Generasi Alfa	2010-2024	12 and below

Based on a study conducted by Accenture (2017), Generation Z is more inclined to make purchases using digital money than Generation Y. Furthermore, 58 percent of Generation Z individuals are willing to pay extra to ensure the timely delivery of goods. This indicates a potential failure of Generation Z to grasp the value of money after using digital payment methods. In this regard, Generation Alpha, born into this fast-paced digital world, can be considered true digital natives, marking a new digital era (McCrindle & Fell, 2020). As true digital natives who see the world through screens, most abstractly view money, considering it simply as numbers on a screen (Thompson, 2019). According to a study by Thompson (2019), more than half (57%) of Generation Alpha say that social media advertising influences purchase decisions. This is concerning because they may not know how to manage money wisely.

Furthermore, a study by the University of Illinois found that the number of transactions increased by 2.4 percent, and the frequency of transactions increased by more than 23 percent after using digital payment methods. Touchless payments are predicted to drive global card spending, such as credit and debit cards, to $45 trillion by 2023 (Xu et al., 2018). Based on the analysis of student performance in the Malaysian Primary School Assesment Test (UPSR), 16.87 percent of primary school students have not reached the minimum level of achievement in the subject of Mathematics, indicating that primary school students in Malaysia still struggle to solve problems related to the topic of Money, according to the (Ministry of Education Malaysia, 2019). In the Programme for International Student Assessment (PISA) international assessment report, it was shown that the average score of Malaysian students in Mathematics is below the international average score, with students lagging in PISA due to their inability to develop higher-order thinking Skills (HOTS) when solving problem-based questions (OECD, 2020).

Transactions involving banknotes and coins will be reduced or possibly irrelevant. This is because using credit or debit cards and money exchange transactions will take over using banknotes and coins such as Boost online applications, e-wallets, and others that do not use cash. Pupils who do not master money are easily confused and tend to be deceived. According to a study by Lai et al (2013), teachers' perceptions of using teaching aids in teaching and learning mathematics are positive. From the affective field, they believe that teaching aids can increase students' interest and feelings of inquiry. Students are also expected to be able to improve their understanding of concepts as well as more active student involvement in learning activities. Based on the above statement, students need to be given an initial reinforcement of the concept of money to better master and appreciate the value of money in everyday situations. Pupils need to be exposed to this concept of money because the use

of money is not only used in schools but is used worldwide. Students need to strengthen their understanding of the concept of money to face the challenges outside and be able to apply entrepreneurial values as required by the Ministry of Education Malaysia (Malaysia Education Development Plan, 2013-2025).

To overcome the above challenges, students need to be given an initial reinforcement on the concept of money so that they can appreciate the value of money, including in digital form. According to Nina Othman (2017), the best age to cultivate a habit is between eight and fourteen. Therefore, this study must be implemented because the teaching of the concept of money that exists now has less impact on students, especially students in years one or two. According to Ngasiman (2014), what students learn does not guarantee their ability to apply mathematical knowledge if classroom teaching is ineffective. Therefore, implementing this lesson study needs to assess the value of using learning kits on money's topic.

Methodology

Respondents underwent the lesson study process using a proper lesson plan, which included five steps: the step of set induction, the step of delivering content knowledge in introducing money, the step of operation in using cash, the step of exchange of money, and step of solving daily problems with cash. All the steps using teaching tools, namely Learning Kit in concrete and digital. Before starting the lesson process, respondents underwent a pretest. The lesson process lasted for two sessions. Each session lasted for one hour. After completing the lesson study, respondents experienced post-testing to determine whether there was a significant difference between the mean achievement of the groups.

In this study, the independent variable is the method used, the money learning kit and the dependent variable is students' achievement in the topic of Money up to RM100. The researcher compared two teaching methods, namely teaching based on the use of concrete money learning kits and digital teaching apps. The purpose was to assess whether significant differences existed between the pretest and post-test. A total of 30 students were selected as study participants (Table 2).

Table 2
Respondent Profile

Gender	**Number (N=30)**	**Percentage (%)**
Boys	10	33.3
Girls	20	66.7
Total	**30**	100

Figure 1 shows the Money Learning Kit applied to help students answer the questions about Money. The use of the kit is appropriate to the level of development of students, namely Year 2 students. The kit has several compartments consisting of examples of money up to RM100. Each compartment can be adjusted by pushing and pulling using a finger, and an example of a banknote will come out or return. The way to use the kit is that students only need to withdraw the value of the money given based on the questions given.

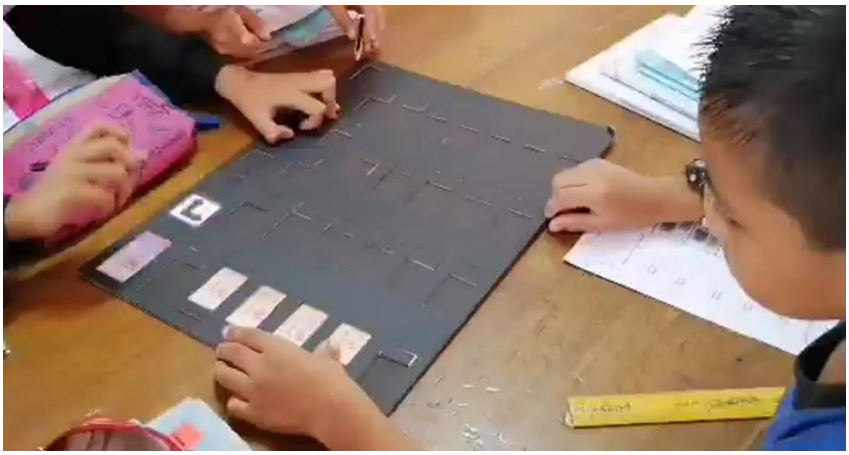


Figure 1: Money Learning Kit

For example, for money exchange, the teacher instructs the student to withdraw the value of money of RM58, and the student has to find the boxes that contain examples of cash until it reaches the total value of funds of RM58. This kit helps teach and learn about money topics, including add and subtract operations. Students need to find the correct amount of money by counting the money sample squares on the kit. This kit is suitable for students who are weak in mental calculations, and they can use it to help them calculate the total value of money.

As for the digital application, the digital teaching aid developed can be used without internet access. The digital aid is ideally used to teach the concept of money to second-year pupils. It has linked the use of money up to RM100 in daily life, which meets the objectives in the title of money contained in the Mathematics Year Two syllabus.

The digital game aid is divided into five stations showing different situations related to the student's daily life. Each station has its requirements and ways to complete it, and students need to unlock the station before it can be played. The condition for obtaining a station key is to answer at least three questions correctly out of five questions for each station. If a student fails to complete a station's requirements, they are allowed to replay the failed station. Figure 2 shows the stations pupils must go through to help Snoopy's character find his way back home.

Figure 2: An example of a digital game

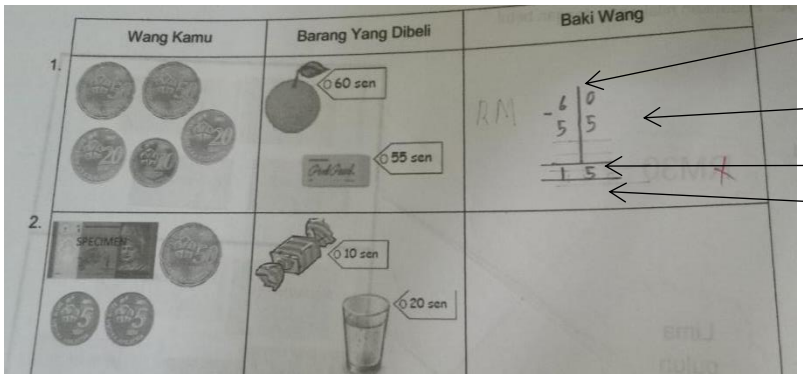
Each station in the digital game shows a variety of real situations, such as situations in cafes, grocery stores, banks, ice cream shops, bakeries, and Snoopy's house, where it uses scenery and music appropriate to their respective situations. The tasks in each digital game station are different, but all the content is contained in the Year Two Mathematics syllabus for the money title and is suitable to be played by second-year students. Pupils must perform their respective roles and read the instructions carefully before starting each station game.

There are 15 question items in this test, and it is divided into three parts, namely Part A (Introduction to Money), Part B (Basic Operations for Money), and Part C (Problem Solving). Meanwhile, a conceptual money analysis is also conducted by calculating such items. Rubric marks are given based on understanding the concept and the order of work of estimating the value of money. The content of this question was checked by an expert in the field of Mathematics, a lecturer at the Institute of Teacher Education, Technical Education Campus, to test the validity and reliability of the test questions. Students are given 60 minutes to answer the question. The period of answering this question was tested during the pilot study. Cronbach Alpha value 0.923, which indicates the reliability of each test item constructed. Reliability refers to the consistency or stability of assessment results (Fraenkel & Wallen, 2019). The expert panel selection consists of two lecturers from the Institute of Teacher Education and a primary school Mathematics teacher with more than ten years of experience teaching Mathematics subjects. It is also the head of the school's Mathematics committee. The validity results obtained show a maximum mean value of 4.00 overall.

Findings

This study aims to determine the importance of implementing this lesson study to assess the value of learning kits on money topics up to RM100 for year two students for mathematics subjects, especially in the concepts of money.

Respondents pointed out weaknesses in making the work path in the pretest, and basic operational calculations were also wrong. Thus, no marks were given for not matching the answers in the scoring scheme. Respondents did not complete the work path, place arrangement for the wrong house, the value for the wrong compartment, and the wrong answer, as shown in Figure 3.



1. The arrangement of the place for the digit is wrong. (0)

2. Incomplete work path. (0)

3. Wrong answer. (0)

4.The values for both squares are wrong. (0)

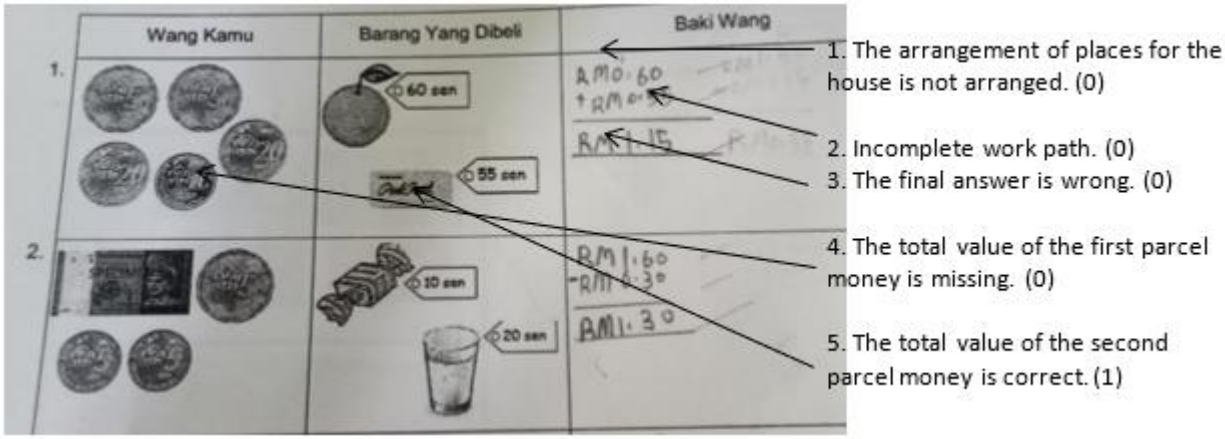


Figure 3: The incorrect concepts operation of topic money

Respondents showed understanding in answering questions and making the correct work path to find value for money in the second box. Respondents showed an improvement but got only one mark out of five marks. Among the criteria that did not meet the scheme were unorganized place arrangement, incomplete work path, no final answer, and no total value for the first parcel money.

During the post-test after the lesson study, respondents showed significant improvement by counting for "Goods Purchased" on the left and indicating the correct final work path. The marks given are full marks for one question, which is five marks, because the respondents meet each criterion in the scheme. Respondents calculated the total value of money for both parcels, the complete work path, the arrangement of places for the correct house, and the correct final answer, as shown in Figure 4.

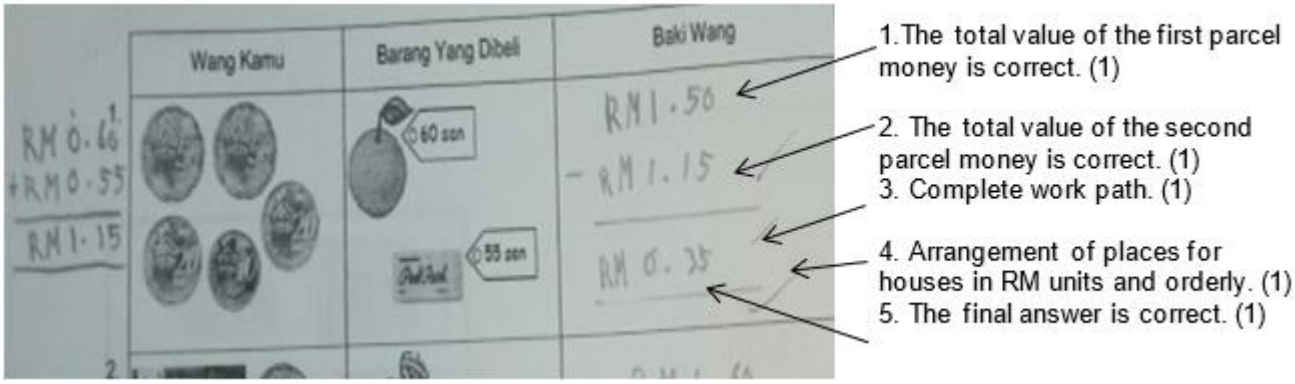


Figure 4: The correct concept operation of topic money

The following is an analysis of marking the question paper based on the scoring scheme provided. This part of conceptual understanding measures students' level of knowledge of money. This section is important to see whether students understand the concept of money or not through the answers given. The student who writes the answer for the value of both squares shows that the student knows how to calculate the amount of money and money operations. Using units is also important to see students' sensitivity in determining which units should be used. The order of places by house should also be considered to get the correct order so that students do not risk making calculation errors. The final answer determines whether the work path created from the beginning is correct.

Therefore, the study findings for the mean of the pretest and post-test of the intervention group are shown in Table 3.

Table 3
Mean Pretest and Post Test for Intervention Group

Group	Mean Pretest	Mean Post Test	The difference
Treatment	25.09	82.91	57.82

Table 3 compares mean percentages for the intervention groups' pretest and post-test. The mean for the intervention group before (25.09%) and after (82.91%) of the study. This indicates a three-fold increase of 57.82% through the use of learning kits that significantly impacted students.
Conceptual knowledge of money is also determined by how students answer questions and submit answers through the correct work path. If the student gets full marks according to the rubric for the item, the student understands the question's requirements.

The study's findings showed a difference in the overall mean of the post-test achievement level based on the concept of money for the students of the intervention group. Data analysis is shown in Table 4.

Table 4
Paired Sample t-test of post-test score differences based on money concept

Experimental Group	Mean	Standard Deviation	Std. Errort Mean		df	Sig
Pre-Post	-45.733	24.341	4.444	-10.291	29	0.000

Table 4 found that the post-test t-value for both groups was 10.291, and the significant (2-tailed) value obtained was 0.000. This indicates that there is a significant difference in the overall mean of the difference for the conceptual learning based on the topic of money (M = 80.80, SP = 14.148), [t (29) = - 10.291, p = 0.000 <0.005]. These results indicate that teaching and learning using money learning kits for Money topics up to RM100 for conceptual understanding has a more significant impact on second-year students.

Suggestion for Future Studies

Based on the study and the findings obtained, some suggestions or improvements can be considered to make this study more useful and meaningful. Among them is that the selection of titles for this study only focuses on level one students, especially year two, who focus on money titles only. Researchers can expand the selection of money titles using money topics for level two. Next, methodological aspects can be developed using qualitative and quantitative research measurement methods. Zainudin et al (2016) stated that the combined method is a more thorough and complete data collection method. Thus, further studies can further strengthen the evidence of the findings of this study.

Conclusion

The results of a study conducted on students showed that teaching and learning using concrete and digital money learning kits for the topic of Money up to RM100 has a more significant impact on second-year students. This can be shown in their test results, where the concept of the arrangement of digits is orderly. They can also calculate the total value of money in each compartment and perform operations to find the money balance. Next, they can show the complete work path and the correct final answer. These results are supported by the findings of previous studies, indicating that the use of learning aids helps in problem-solving for the title of money successfully helped all study participants understand and solve money-related questions. The findings of this study also have important implications for students, teachers, and the school. This study helps students improve their conceptual comprehension skills to comprehend money calculations.

Moreover, the future time that only uses e-money requires high conceptual understanding and knowledge. Through the teacher aspect, teachers can strengthen students' conceptual understanding of money so that, in the future, they will be more skilled in using conceptual knowledge to calculate money virtually. Therefore, teachers need to enhance students ’conceptual understanding to prepare them to face future challenges. This study is also expected to benefit all levels of society, especially schools, teachers, and students, to produce students who are money-literate and creative thinking in the world of education in the 21st century. Management should work with teachers to provide equipment and facilities as a facilitator for teachers to implement the teaching and learning process smoothly. Individuals with conceptual knowledge of money will be more skilled and intelligent in calculating budgets, expenses, consumption, and purchases because using e-money is easier and easily overlooks one’s ability to spend.

Acknowledgments

The researcher would like to thank the Institute of Teacher Education Malaysia and school students who agreed to participate in this study. The authors explicitly stated that there is no conflict of interest in this article. Author 1 was responsible for conducting the field work, developing the research methodology, and overseeing the writing of the entire article. Author 2 and 3 contributed by writing the literature review and conducting the data entry. All authors conducted the statistical analysis and interpreted the results.

Reference

Accenture. (2017). *Generation Z to switch the majority of purchases to retailers that provide the newest digital tools and channels*. Global Consumer Shopping Survey 2017. https://www.accenture.com/_acnmedia/pdf-44/accenture-retail- customer-journey-research-2017-infographic.pdf

Aisyah, A. R., & Wajeeha, Z. (2016). Faktor penentu pengurusan kewangan: Kes mahasiswa Universiti Kebangsaan Malaysia. *Jurnal Personalia Pelajar, 19*(2), 85-94. http://journalarticle.ukm.my/10895/1/Artikel-9_Dr.-Aisyah-Abdul- Rahman_FEP.pdf

Fraenkel, J., & Wallen, N. (2019). *How to design and evaluate research in education* (10th ed.). McGraw Hill.

Huzaimah, Y., & Ahmad, A. (2017). Tahap literasi kewangan di kalangan mahasiswa [The level of financial literacy among undergraduates]. In International Conference on Global Education V "Global Education, Common Wealth, and Cultural Diversity." Universitas Ekasakti, Padang, April 2017.

Lai, K. L., Khaw, A. H., & Seah, A. K. (2013). *Satu kajian mengenai penggunaan bahan bantu mengajar dalam pengajaran pembelajaran matematik di sekolah rendah* [A study on the use of teaching aids in the teaching of mathematics in elementary school]. Maktab Perguruan Batu Lintang.

McCrindle, M., & Fell. A. (2020). *Understanding Generation Alpha*. McCrindle Research.

Ministry of Education Malaysia. (2013). *Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025* [Malaysia Education Blueprint 2013-2025].

Ministry of Education Malaysia. (2019). *Pelaporan Pentaksiran Sekolah Rendah 2019* [Primary School Assessment Report 2019].

Nina Othman, I. F. (2017, Julai 25). *Financial literacy: Starting them young*. Personal Wealth, The Edge Malaysia Weekly. https://www.theedgemarkets.com/article/financialliteracy-starting-them-young

Ngasiman, N. (2014). *Kesan kaedah pembelajaran koperatif terhadap pencapaian pelajar dalam mata pelajaran matematik* [The effect of cooperative learning methods on student achievement in mathematics subjects] (Unpublished Master thesis). Universiti Tun Hussein Onn Malaysia.

OECD. (2020). *PISA 2018 Results (Volume IV): Are Students Smart about Money?* PISA, OECD Publishing. https://doi.org/10.1787/48ebd1ba-en

Prebiu. (2019). *Trend guna kemudahan tanpa tunai semakin meningkat-Kad Merchantrade turut raih popularitи* [The trend of cashless facilities is increasing- Merchantrade cards are also gaining popularity.]. https://prebiu.com/2019/03/04/trend-guna-kemudahan-tanpa-tunai-semakin-meningkat-kad-merchantrade-turut-raih- populariti/

Rubayah, Y., Hawati, J., & Nur Ain, K. (2015). Financial literacy level among public university students: Evidence from Universiti Kebangsaan Malaysia. *Jurnal Personalia Pelajar, 18*(1), 75–88.

Sobrey, J. A. (2018). *Gelombang sistem bayaran tanpa tunai* [Wave of cashless payment system]. Kosmo Online Jurnal. http://psasir.upm.edu.my/id/eprint/66522/1/Gelombang%20Sistem%20Bayaran%20Tanpa%20Tunai.pdf

Thompson, W. (2019). *Generation Alpha: Preparing for the future consumer*. Wunderman Thompson Commerce Research. https://gertkoot.files.wordpress.com/2019/10/wtcgeneration-alpha-2019.pdf

Xu, Y., Ghose, A., & Xiao, B. (2018). *The impact of mobile payment channel on consumer consumption: Evidence from Alipay.* SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3270523

Zainudin, M. Z., Omar, R., & Kamarudin, M. F. (2016). *Kaedah gabungan (mixed methods) dalam kajian pembasmian kemiskinan di malaysia dan Indonesia: pengalaman penyelidikan* [Mixed methods in poverty eradication studies in Malaysia and Indonesia: Research experience. Universiti Teknikal Malaysia Melaka.