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Interdisciplinary Thinking: Financial Literacy Crosses Disciplinary Boundaries

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Abstract

Financial literacy is ideally suited to be integrated into mathematics courses and taught in an interdisciplinary manner. Students learn best and are motivated when tackling real-world meaningful questions. This article shares how elementary mathematics was applied to better understand the debate about raising the minimum wage and the United States National Debt. To serve as a guide for other teachers who wish to incorporate financial literacy into their mathematics courses and take an interdisciplinary approach, this article suggests readings, data sets, and pedagogical practices. Students were engaged and enthusiastic to work on problems that challenged their thinking about financial issues

Keywords: Financial literacy; interdisciplinary thinking; minimum wage; national debt; quantitative reasoning

1. INTRODUCTION

Financial literacy should move to a more prominent position in the mathematics curriculum [13], as it is ideally suited to promote interdisciplinary thinking. Financial literacy is necessary for students' personal and professional lives [1,13,15], as well as their roles as actively engaged citizens. Despite the need for financial education and the belief that finance should be taught in school [4], the level of financial literacy of high school students, and young adults in the United States is low [8]. College students are more financially literate than high school students or young American adults, but also have gaps in their understanding of financial literacy [13]. Teachers' real-world knowledge of finance, combined with financial literacy's broad appeal makes this an important interdisciplinary topic that can be readily integrated into a wide range of mathematics and mathematics education courses. Moreover, learning about finance can empower students to understand public policy decisions that often rely on the application of elementary mathematics and a combination of economics, ethics, and equity.

This paper, which reflects on my classroom experience, serves as a guide for teachers who wish to incorporate financial literacy into their mathematics courses and take an interdisciplinary approach. This article is divided into four sections followed by a conclusion. The financial exercises in this paper were used in a college Quantitative Reasoning course. The first section describes the course and the overarching learning objectives. The next three sections provide examples of real-world financial exercises and pedagogical practices. To guide the reader through the financial literacy lessons, each section contains specific learning objectives, an activity, a list of recommended readings and websites that contain data sets, teaching tips to help facilitate an interdisciplinary approach, students' solutions, a discussion of students' gains and misconceptions, and more challenging extension exercises that could be used

in more advanced mathematics courses such as statistics, precalculus, or finite mathematics. The article concludes by reflecting on the challenges, goals and benefits of incorporating financial literacy activities into elementary mathematics courses using an interdisciplinary approach. Students were genuinely interested in learning how select mathematical calculations could be used to support an argument and were highly motivated to use elementary mathematical calculations to examine meaningful, real-world issues.

2. QUANTITATIVE REASONING AND FINANCIAL LITERACY

The exercises in this paper were used in an introductory Quantitative Reasoning course that retaught basic mathematics and had no prerequisites. The course covered the following elementary mathematics topics: proportional reasoning, percent, estimation, place value, descriptive statistics, linear and exponential growth, scientific notation, and mathematical modeling. The course focused on incorporating real-world examples while reviewing elementary mathematics. The overarching aim of the Quantitative Reasoning course was to develop a sense of mathematical literacy or fluency with numbers and to help students appreciate how even simple mathematics concepts could be applied to better understand real-world issues.

Many students in the Quantitative Reasoning course had significant gaps in their mathematical background. Given the level of the course, the activities presented could be used in a wide range of introductory mathematics courses including: Elementary or College Algebra, Mathematics for Liberal Arts and Quantitative Reasoning. Each section concludes with more challenging exercises that could also be used in Statistics, Precalculus or Finite Mathematics courses. The activities could be incorporated into both 2-and 4-year college and high school courses. Additionally, because many teachers have not taken Quantitative Reasoning or may not have seen an interdisciplinary approach used to teach financial literacy, the exercises could also

be integrated into the curriculum of graduate mathematics education programs designed for both pre-service and in-service teachers or used for professional development.

Each activity was completed during one or two class sessions. Students worked on the activities either in groups or individually, and their answers were shared with the class and discussed. The questions were presented in an open-ended manner. Mathematics education organizations and researchers support this more challenging way of stating problems [9,14,16]. For students with large gaps in their background who were not making progress, hints were provided or closed-ended questions were suggested to scaffold the learning. No formal assessment was done. For all of the activities, a few key learning objectives were: to develop students' confidence and ability to use quantitative methods to understand and interpret information, to understand how numbers can be used to support an argument, to examine economic decisions with a lens of equity, and to develop a very elementary understanding of economics.

Although these activities crossed disciplinary boundaries, there is a wide variance in the degree of interdisciplinary thinking about financial literacy that students can engage with in mathematics courses, ranging from tackling applied problems with a real-world context to having in-depth discussions about economic policies or issues of equity. Based on students' limited prior knowledge of economics, when I taught these activities, my goal was to have students explore issues of equity based, in part, on their personal real-life experiences, use mathematics to examine real-world financial problems and increase students' very rudimentary understanding of finance. Another goal was to develop a very basic understanding and awareness of different perspectives about economic policies and decisions. Therefore, the lessons were designed to be in the middle of the spectrum of interdisciplinary thinking. As

issues of equity were being discussed at campus events and in other courses, students had explored issues of fairness on a wide range of topics as varied as the cost of housing, food deserts, and the quality and cost of education. In mathematics courses that have prerequisites or co-requisites of economics or business courses, teachers could strengthen the interdisciplinary nature of the activities where the mathematics and suggested reading could result in robust conversations about economic policy.

3. LESSON 1: CONSTANT OR DIMINISHING GAINS

The learning objectives for this activity were:

1. Use elementary mathematics as a tool to analyze and gain a deeper level of understanding of real-world problems.
2. Perform basic operations involving absolute and relative change and develop the ability to interpret and compare the results.
3. Demonstrate the ability to apply mathematics to open-ended questions and use real-world data to support an argument.
4. Construct, interpret and analyze various graphical representations of data sets.

More challenging extension activities are suggested for courses that cover the following learning objectives:

1. Write and solve equations algebraically and graphically and interpret the solution.
2. Collect data and use the data to compute and interpret correlation coefficients.
3. Perform and interpret the results of hypothesis tests.
4. Use data and descriptive and inferential statistics as a tool to support an argument about an economic policy.

At the start of the activity, students were told that according to the New York State Department of Labor, the minimum wage for New York City workers in small businesses was set to increase by $1.50 per year over the next few years [10], see Table 1.

Table 1. General minimum wage rate change schedule for New York City small employers

	12/31/16	12/31/17	12/31/18	12/31/19
NYC - small employers (10 or less)	$10.50	$12.00	$13.50	$15.00

The class was asked to construct an argument in favor of or against constant increases of $1.50 per year to the minimum wage. Students were told to use the data in Table 1 to support their arguments. Students were also asked to consider the following two questions: Could there be a downside to constant dollar increases? Are constant dollar increases the same as constant percent increases?

3.1. Teaching Tips: Constant or Diminishing Gains

The activity was designed to be closely aligned with students' interests and to make use of their knowledge about changes to the minimum wage in New York City, where I teach. Before the lesson began, students were surveyed and by a show of hands indicated whether they were in favor of or against the minimum wage being increased by the same dollar amount each year. Overwhelmingly, students felt positive about receiving constant predictable dollar pay increases each year.

The data used in this exercise is available on the official website for New York State [10]. Teachers from other states, or teachers who wish to work with larger data sets and make

comparisons between their state and other states, can find data on historic changes to the minimum wage [19] and minimum wage laws [20] by state on the United States Department of Labor Website.

For students who had gaps in their backgrounds, teachers may want to ask students to calculate the percentage by which the minimum wage changed from 2016 to 2017 and from 2017 to 2018. Using this information, students could be asked to predict the percentage by which the minimum wage would increase from 2018 to 2019. As students have different learning styles and different ways of demonstrating what they know, teachers could also suggest that students solve the problem graphically. This would also reinforce the connection between different solution strategies. After finding the percent change, students were asked to explain why if the dollar amount increased the percent change decreased.

3.2. Solution: Constant or Diminishing Gains

Students were able to show that although the dollar pay increase remained constant, the percent by which a worker's rate of pay increased steadily declined. Students calculated that in 2017, the percent by which a worker's salary rose was \$1.50 increase per hour ×100%/\$10.50 pay rate per hour for 2016 ≈ 14.3%. In 2018, the percent by which a worker's salary rose was \$1.50 increase per hour ×100%/\$12.00 pay rate per hour for 2016 = 12.5%. Therefore, clearly a downside of constant, equal pay raises is that while one's salary increases by the same amount each year, the percent by which one's salary changes decreases each year.

To solve the problem, students could have been asked to construct a line graph or a bar graph to demonstrate the downside of receiving the same pay raise year after year. Alternatively, teachers could share Figure 1 with the class, which shows the minimum wage and percent

change graphed together, and ask students to verify the information presented and interpret the graph.

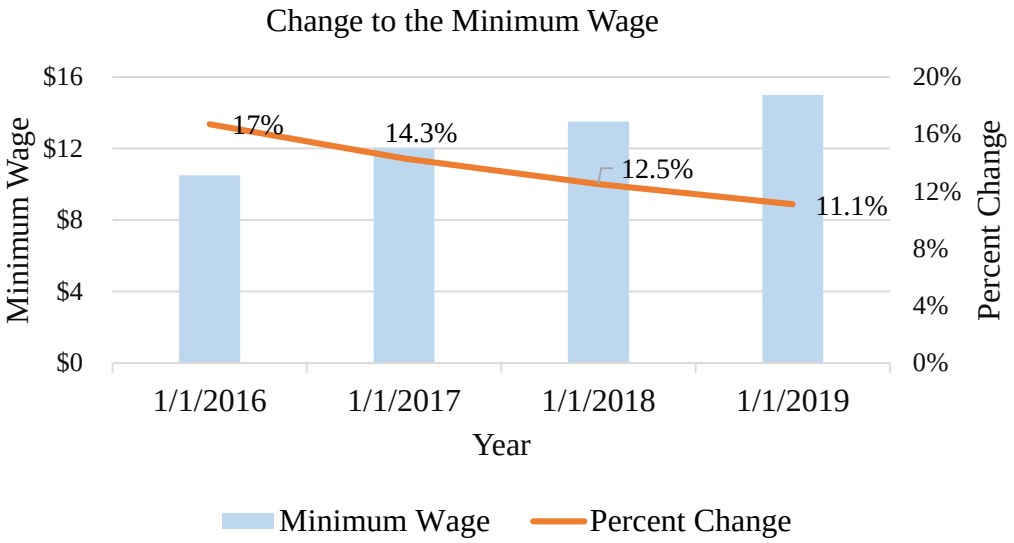

Figure 1. Absolute and percent change to the minimum wage.

3.3. Teaching Reflection and Extensions: Constant or Diminishing Gains

Although students understood how to calculate absolute and percent change, most had not realized that increasing one's salary by a set dollar amount each year would result in increasing one's salary by a smaller percentage each year. Even after students shared their answers with the class and attempted to clarify that the same hourly pay raise would be a smaller percentage of the new higher hourly rate of pay, some students still found it difficult to understand why this was the case. To help students develop an intuitive understanding, I asked the class about their career aspirations. Using a student's projected future salary, the class was asked to assess how a lawyer making $150 per hour might feel about receiving a raise of $1.50 per hour. Students volunteered that this would be a meager, unsatisfactory increase. Asked why, students correctly calculated

that this would only amount to a 1% raise, which probably would be below an increase in the cost of living. Students were able to extend their intuitive understanding to the assigned problem, which clarified why salary increases by the same dollar amount would lead to progressively smaller percent increases. Students felt that one's perception could be changed by selecting which figure to present, as a pay raise of 14.3% seemed like a greater increase than a pay raise of $1.50 per hour. This lesson helped students better understand why in the real-world the absolute and relative change can present different pictures, which can be used to sway one's opinion on an issue.

For courses at a higher level, the following more challenging problems could be assigned:

1. If the minimum wage for New York were to increase by $1.50 per year, in how many years would the percent increase be 2%? Students should be encouraged to solve the problem algebraically and graphically.
2. The United States Bureau of Labor Statistics tracks the Consumer Price Index, which is a weighted average of prices of items that consumers use. Read about the percent change in goods that make up the Consumer Price Index in the article "One Hundred Years of Price Change: The Consumer Price Index and the American Inflation Experience" by Stephen Reed [12]. Using data showing the historic minimum wage, calculate the correlation between the minimum wage and either the Consumer Price Index or the price of one item the Consumer Price Index tracks.
3. Using data showing the poverty thresholds [17] over time from the United States Census Bureau, calculate the correlation between the yearly salary of an employee working full-

time at a minimum wage job and the Poverty Threshold. Using the correlation coefficient, describe the relationship.

4. Conduct a paired samples t-test to determine whether, among single workers over the last 30 years, the salary earned by working full-time at a minimum wage job is above the poverty threshold.
5. Use the results of questions 2, 3, and 4 to support an argument in favor of or against raising the minimum wage.

4. LESSON 2: INCREASE OR MAINTAIN THE MINIMUM WAGE

The learning objectives for this activity were to:

1. Demonstrate the ability to use mathematics to support, refute, and assess the validity of an argument.
2. Solve open-ended questions where the data provided are not translated into the language of mathematics.
3. Develop an increased appreciation for, and in-depth understanding of, issues of equity by using mathematics to examine the impact of policy changes, from multiple perspectives.

More challenging extension activities are suggested for courses that cover the following learning objectives:

1. Translate real-world open-ended questions that can be solved mathematically into equations.
2. Solve equations and interpret the solution within the context of the problem.

The class was presented with Table 2, which shows future changes to the minimum wage for big and small employers in New York City [10].

Students were asked if the minimum wage should be raised from the perspective of a minimum wage worker and from the perspective of a small business owner. Half the class was assigned to present the case from the perspective of minimum wage workers and the other half of the class was assigned to present the case from the perspective of a small business owner. Students had to consider whether raising the minimum wage was an issue of treating workers fairly and with compassion or, from the perspective of a small business owner, if opposing an increase in the minimum wage was a matter of survival rather than self-interest. In both cases, students were instructed to use the data to support their decision.

Table 2. General minimum wage rate schedule for New York City

	12/31/16	12/31/17	12/31/18	12/31/19
NYC - Big Employers (of 11 or more)	$11.00	$13.00	$15.00	
NYC - Small Employers (10 or less)	$10.50	$12.00	$13.50	$15.00

4.1. Teaching Tips: Increase or Maintain the Minimum Wage

To increase students' knowledge of the arguments being made to maintain or increase the minimum wage, a week prior to the lesson teachers could assign the following four brief articles:

- "A Case Against the Minimum Wage" by Gary Wolfram [21],
- "Why It's the Perfect Time to Raise the Federal Minimum Wage" by Chris Lu [7],
- "The Case for Raising the Minimum Wage Keeps Getting Stronger" by Linda DePillis [2],
- "Raising Minimum Wage Is Misguided Policy" by Douglas Holtz-Eakin [6].

These four articles present a balanced perspective, as two of the articles are in favor of increasing the minimum wage and two oppose an increase. For teachers from other states, the article entitled "Minimum Wage Changes in 2018: State by State Guide" by Annemaria Duran [3] contains a wealth of information on specific minimum wage laws for each state. Up-to-date information on changes to the minimum wage can also be found by searching on each state's website.

Teachers may want to ask students presenting the argument that the minimum wage should be increased to calculate a minimum wage worker's yearly salary and to approximate the cost of living in New York City. I suggested students notice any increase in jobs that were automated in small businesses and share with the class the impact this might have on workers ability to secure a higher rate of pay. For students presenting the employer's perspective, teachers may want to suggest that students calculate the cost of keeping 11 employees vs the cost of letting one employee go to pay all of the retained employees a lower wage.

4.2. Solution: Increase or Maintain the Minimum Wage

Viewed from the individual employee's perspective, the difference seemed relatively small and equitable. In 2018, each employee working for a small business would receive a yearly salary of 1 employee × $13.50 per hour × 40 hours per week × 52 weeks per year = $28,080; whereas each employee working for a large business would receive a yearly salary of 1 employee × $15.00 per hour × 40 hours per week × 52 weeks per year = $31,200. This was thought to be a low wage based on the high cost of housing in New York City. By contrast, viewed from the perspective of a business owner with 11 employees, the increase was seen as large and unsustainable. In 2018, the combined salaries per year for all 11 full-time workers would be: 11 employees ×

$15.00 per hour × 40 hours per week × 52 weeks per year = $343,200. In 2018, the combined salaries for all 10 full-time workers would be: 10 employees × $13.50 per hour × 40 hours per week × 52 weeks per year = $280,800. As a result, it would be extremely expensive to keep the 11^{th} employee, since the extra expense would be $343,200 – $280,800 = $62,400. This financial analysis supported a decision contrary to students' personal beliefs.

4.3. Teaching Reflection and Extensions: Increase or Maintain the Minimum Wage

Students found the activity challenging when the question was phrased in an open-ended manner. Some students compared the cost of a business with 20 employees and a business with 10 employees. Although the difference was large, students realized that, in all likelihood, a business could not cut its workforce in half. Some students calculated the cost to the business owner of keeping all 11 employees and compared that with the cost of keeping 10 employees. Although some students who took this approach thought to subtract the two numbers, few made the argument that, from a business owner's perspective, the difference of $62,400 could be viewed as one low-skilled worker's yearly salary. After discussing this point, most students agreed that viewing the difference as one worker's salary presented the strongest case for firing a worker. Teachers could consider asking students to interpret what the dollar amount represents in words. Some students on the employee side had thought to do more research to connect the yearly salary with the cost of living in New York City, but did not have time to collect and analyze data. Seeing both arguments, students better understood how the media could elect to show mathematically correct numbers to highlight one side of an issue. In the class discussion, students stressed the importance of looking at the data and analyzing the numbers themselves.

This activity was designed to connect with students' real-life work experience. At the start of this lesson, I surveyed my students and asked what their hourly wage was. None were

paid more than the minimum wage. However, this does not mean that some or even most small business owners do not pay their employees a wage that is above the current or future minimum wage. Additionally, the profit margin small business owners make may be large enough to absorb the cost of retaining the 11th employee. Therefore, teachers may want to ask their students to research the profit small business owners make and what percent of small businesses pay above the minimum wage, so that students can verify if the assumptions are correct and more fully understand the potential impact of raising the minimum wage.

To extend the exercise and challenge students a bit more, the following question could be assigned:

1. Write the equation of a function that tells a business owner how much each of the fired workers would be paid if the owner is comparing keeping x employees, where x is some number greater than 11 as opposed to keeping only 10 employees.
2. Use the equation to determine how big the workforce would have to be before the fired employees would each be viewed by the owner as having a salary of $32,000.

5. LESSON 3: THE UNITED STATES NATIONAL DEBT

The learning objectives for this activity were to:

1. Increase facility and comfort with estimation and numeracy skills.
2. Apply mathematics to basic real-world economics to gain a deeper level of understanding.
3. Recognize and be able to use mathematics as a tool to assist with decision making.

More challenging extension activities are suggested for courses that cover the following learning objectives:

1. Collect data and use the data to compute and interpret correlation coefficients, which will be used to support an argument about a policy.
2. Create a mathematical model to match a real-world economic problem and use the model to make predications.

To start the lesson, students were asked to list the programs the United States government finances and decide whether the government should continue to fund these programs at the same rate, a higher rate, or a lower rate. Next, students were asked: How much is the United States National Debt? Estimate the United States National Debt per person and per taxpayer and then research the numbers and calculate the exact amount. How did the data impact your decision about which programs to fund?

5.1. Teaching Tips: The United States National Debt

Students had an approximation of the United States population from past problems, though they did not know exactly what percent of the United States population paid taxes. The class was asked to write out all numbers in words in addition to listing the dollar amount to confirm that the number listed was the amount intended. After collecting students' estimates and debating whether the United States National Debt should be increased, teachers could assign the following readings: "As Deficit Soars Toward $1 Trillion, Congress Shrugs and Keeps Spending" by Alan Rappeport and Thomas Kaplan [11] and "The National Debt Is Worse Than You Think" by William A. Galston [5]. At the end of the lesson, students viewed the United States Debt Clock [18], which shows changes to the United States National Debt and funding for government programs in real-time.

5.2. Solution: United States National Debt

At the start of the class discussion, students generated an extensive list of programs that the government funds including: defense, education, environmental protections, financial aid, health, Medicaid, Medicare, police, public safety, Social Security and Supplemental Nutrition Assistance Program. The class favored increasing or maintaining the present level of funding for every program except the military. Few of the students either knew the amount of the United States National Debt [13] or were initially able to estimate how much each person living in the United States or each taxpayer owed. One student, working without a calculator, estimated the United States National Debt and the debt per person to be $7 trillion and $65, respectively. Working in groups, the class was told that the United States National Debt was approximately $21 trillion and that the United States population was approximately 328 million and that approximately 122 million people paid taxes. Several students correctly calculated the United States National Debt per person and per taxpayer was $21 trillion/328 million ≈ $64 thousand and 21 trillion/122 million ≈ $172 thousand. When the numbers were viewed as debt per person and debt per taxpayer, and were smaller more manageable numbers, students' opinions about government spending changed.

5.3. Teaching Reflection and Extensions: United States Nation Debt

Working with large numbers proved difficult, even when students used calculators, as students were unable to assess the reasonableness of their answers. Initially most students underestimated the amount of debt per person or per taxpayer, suggesting that students were not considering place value when dividing, but were instead attempting to judge what might be a reasonable estimate for a person or for a taxpayer to owe. It was difficult for students to understand the difference between the United States National Debt being $5 billion, $50 billion, or $5 trillion.

Many students were intimidated working with large numbers. In this exercise, students seemed only to have understood the enormity of the United States National Debt after calculating debt per taxpayer, highlighting the importance of being able to work with large numbers.

For mathematically stronger students, the following activities that extend the exercise could be assigned:

1. In the news, there are frequently articles written about the trade imbalance between the United States and other countries. Research another country's national debt over a decade. Calculate the correlation between the United States National Debt and another country's national debt. Can the results be used to argue that trading policies are fair or unfair?
2. There is concern that funds for governmental supported programs will run out. Pick a program the government funds, such as Social Security, Supplemental Nutrition Assistance Program, Medicare, or Medicaid and research the program's funding and benefits in the last year. If the program selected will no longer be funded, for how many more years will the program be solvent if funds are depleted at a rate of 15% per year? This problem could be approached algebraically and graphically.

6. CONCLUSION: TEACHING GOALS AND REFLECTION

Quantitative Reasoning is designed to teach basic mathematics skills and to highlight the value of applying elementary mathematics to better understand real-world problems. At the start of the semester, I asked students how important it was to be financially literate. One-hundred percent thought it was "*important*" or "*very important*," yet many recognized that they were not financially literate. One student wrote, "*I'm not too financially literate. I learned a little bit in*

high school, but not enough." As the course revisited elementary mathematics skills, which students can feel are repetitive, I made the decision to focus on financial literacy to increase students' knowledge of basic finance and their level of engagement. By phrasing the questions in an open-ended manner, elementary questions became a bit more demanding.

There were several challenges inherent in teaching these activities and taking a modest interdisciplinary approach. First, students may have little prior knowledge of economics and finance. I have found it helpful to start the activities with a discussion of personal finance or financial policies that can impact students' lives. Using a lens of equity, students could contribute to the conversation based on their experiences and gain a better understanding of different perspectives. As most students were being paid the minimum wage, they were engaged and eager to understand the opposition to increasing a minimum wage worker's rate of pay. The approach of asking students to consider whether a policy is fair did not rely to a significant extent on unfamiliar economic policies that students may not have the time and background knowledge to delve into deeply. To foster a fruitful discussion about the National Debt, teachers could approach the activity by discussing funding for programs that presently impact students, such as tuition assistance and school loan forgiveness. It is valuable for students to understand how difficult financial decisions can be when funds are limited.

Another challenge in teaching these activities is that, whenever possible, questions were posed in an open-ended manner. Although not selecting the strategy to be used to solve problems better models how mathematics is used in the real-world, students may find it difficult to select a strategy. Teachers may want to consider pairing off students to work collaboratively on the exercises. Teachers may also want to remind the class that the exercises can be approached algebraically, graphically, or by using trial and error to test numbers. Teachers

should be mindful of the fact that students likely will need more time to explore problems in-depth that do not come with directions telling them how to proceed. If students are struggling, teachers can direct students to a specific method and ask them to write and interpret the solution.

Despite the challenges, there are tremendous benefits from having students learn to present different sides of real-world financial issues and have their argument supported by data and current articles. Students were able to gain a deeper level of understanding of complex real-world issues that, in all likelihood, they would not have arrived at analyzing the situation from only one perspective. Analyzing the data using a moderate interdisciplinary approach, sometimes led students to draw conclusions that were contrary to their own personal beliefs. Students developed an intuitive understanding of working with numbers and saw the importance of applying elementary mathematics to better understand economic issues. Students came to appreciate how numbers could be used to support an argument by selecting which basic calculations to present. Simultaneously, using the activities, students were motivated and engaged as they reviewed and strengthened their elementary mathematics skills and became a bit more skeptical consumers of financial information.

REFERENCES

1. Council for Economic Education. 2018. Survey of the States: Economic and Personal Financial Education in Our National Schools 2018, New York, NY: Council for Economic Education. https://www.councilforeconed.org/wp-content/uploads/2018/02/2018-SOS-Layout-18.pdf

1. DePillis, L. 2017, April 27. The case for raising the minimum wage keeps getting stronger. https://money.cnn.com/2018/04/27/news/economy/minimum-wage-increase/index.html. Accessed July 18, 2018.

2. Duran, A. 2017, November 29. Minimum wage changes in 2018: State by state guide. https://www3.swipeclock.com/blog/minimum-wage-changes-2018-statestate-guide/. Accessed 18 July 2018.

3. Financial Industry Regulatory Authority. 2013. Financial Capability in the United States: Report of findings from the 2012 National Financial Capability Study. Washington, DC: Financial Industry Regulatory Authority.

4. Galston, W. A. 2018, April 17. The national debt is worse than you think. https://www.wsj. com/articles/the-national-debt-is-worse-than-you-think-1524004495. Accessed 18 July 2018.

5. Holtz-Eakin, D. 2013, December 4. Raising minimum wage is misguided policy. https://www.nytimes.com/roomfordebate/2013/12/04/making-low-wages-liveable/ raising-minimum-wage-is-misguided-policy. Accessed 18 July 2018.

6. Lu, C. 2017, July 24. Why it's the perfect time to raise the federal minimum wage. http://time.com/4870916/congress-federal-minimum-wage/. Accessed 18 July 2018.

7. Mandell, L. 2008. The Financial Literacy of Young American Adults: Results of the 2008 National Jump$tart Coalition Survey of High School Seniors and College Students. Washington, DC: The Jump$tart Coalition for Personal Financial Literacy.
8. National Council of Teachers of Mathematics. 2014. Principles to Actions: Ensuring Mathematical Success for All. Reston, VA: National Council of Teachers of Mathematics.
9. New York State Department of Labor. 2017. Upcoming minimum wage increases. https://labor.ny.gov/workerprotection/laborstandards/workprot/minwage.shtm. Accessed 14 November 2017.
10. Rappeport, A. and T. Kaplan. 2018, January 31. As deficit soars toward $1 trillion, Congress shrugs and keeps spending. https://www.nytimes.com/2018/01/30/us/politics/federal-deficit-1-trillion.html. Accessed 18 July 2018.
11. Reed, S. 2014, April. One hundred years of price change: The Consumer Price Index and the American inflation experience. https://www.bls.gov/opub/mlr/2014/article/one-hundred-years-of-price-change-the-consumer-price-index-and-theamerican-inflation-experience.htm. Accessed 18 July 2018.
12. Sole, M. A. 2014. Financial literacy: An essential component of mathematics literacy and numeracy. Journal of Mathematics Education at Teachers College. 5(2): 55–62.
13. Sole, M. A. 2016. Multiple problem-solving strategies provide insight into students' understanding of open-ended linear programming problems. PRIMUS. 26(10): 922–937.
14. Sole, M. A. 2017. Financial education: Increase your purchasing power. Mathematics Teacher. 111(1): 60–64.

15. Sole, M. A. 2018. Open-ended questions: A critical class component. Mathematics Teacher. 111(6): 462–465.
16. United States Census Bureau. Poverty thresholds. https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html. Accessed 18 July 2018.
17. United States Debt Clock. http://www.usdebtclock.org/. Accessed 18 July 2018.
18. United States Department of Labor (Wage and Hour Division). Changes in basic minimum wages in non-farm employment under State Law: Selected years 1968 to 2017. https://www.dol.gov/whd/state/stateMinWageHis.htm. Accessed 18 July 2018.
19. United States Department of Labor (Wage and Hour Division). Minimum wage laws in the States. https://www.dol.gov/whd/minwage/america.htm. Accessed 18 July 2018.

2. Wolfram, G. 2017, September 12. A Case against the Minimum Wage. Forbes (Guest Post). https://www.forbes.com/sites/realspin/2017/09/12/a-case-against-the-minimum-wage/#16f4d02e499e. Accessed July 18, 2018.