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**Article**

# Gender disparity in financial literacy

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# Gender Disparity in Financial Literacy:
# Evidence from Homogeneous Group

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**Abstract:** This paper interrogates the reality or otherwise the gender disparity in financial literacy using a homogenous group of randomly selected and 560 responded business students of School of Business, University of Cape Coast, Ghana. The intention is to provide a better understanding of the confounding issues of gender as a determinant of financial literacy. Using a Chi-square and Independent t-test, this study analysed gender disparity in financial literacy of homogeneous group of 560 business students. The male respondents were found to have an advantage in computational ability whilst the females are advantaged in non-computational ability. This observed nominal difference was, however, found not to be significant through chi-square test of independence and independent t-test. Again, the effect sizes in all cases are very small which suggest diminishing differences due to the homogeneous nature of the sample. The implication is that documented significant sex difference favouring male in financial literacy could emanate from sample dissimilarity and that irrespective of one's financial orientation or experience, subsequent financial education is capable of bridging the literacy gap. This is important for the policy to bridge the sex gap in financial literacy.

**Keywords:** gender disparity; financial literacy; issues of gender

**JEL Classification:**

## Introduction

The set of skills and knowledge that allow individuals to make prudent financial decisions is paramount for wealth creation and economic development of society. As such, financial literacy which provides these skills and knowledge is receiving much attention in the literature (Olga, 2011). James (2009) defines financial literacy as individual ability to understand financial product and concept, appreciate the financial risk through their ability and confidence to make informed choices. It includes identifying sources of financial advice and effective action to improve individual's financial well-being. Simply put, it refers to the possession of skills, knowledge and ability to make financial decisions, which optimize individual's well-being. The importance of financial literacy is, therefore, crucial for individuals and society because of its implications for wealth creation and financial well-being (Van Rooji et al, 2012)

Empirical and theoretical literature offer a number of factors to explain differences in financial literacy among individuals and various demographic categories (see Agarwalla, Barua, Jacob & Varma, 2015). The dominants of these demographics are age, sex, employment status, education, location, etc. Of these; sex had come out strongly; that financial literacy is a factor of sex. Prior researchers posit that females are likely to display a lower level of financial literacy compared to their male counterpart (Chen & Volpe, 2002; Mandell, 2008; Lusardi et al, 2010). These differences emanate from different sources. For example, Agnew and Cameron-Agnew (2015) observed that the timing of the individuals' first financial discussion in the home influence their future financial literacy and this financial socialisation in the home are gender bias in favour of the male. Yu, Wu and Chun (2014), however,

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explained the differences from differences in risk tolerance and computation ability between male and female. Again, females exhibited a low level of financial literacy as against males. These findings from earlier studies, Chen and Volpe (2002), and Goldsmith, Goldsmith (1997), linked the lack of confidence about financial decisions, interest in investment and personal finance, and risk tolerance of females to their low-level financial literacy.

However, Schubert, Brown, Gysler, and Brachinger (1999) proposition that risk attitude of male and female did not differ under controlled economic condition presents a different dimension of the observed sex differences in financial literacy. The implication is that, for a homogeneous group, differences in financial literacy between male and female are not likely to exist. The homogeneous group in this sense refers to subjects with similar level of financial orientation or education. For example, Wagland and Taylor (2009) studies on financial literacy of undergraduate business students at University of Western Sydney, Australia showed that females were slightly literate than male but not statistically significant. It should be noted that undergraduate business students have been directly or indirectly subjected to financial education through courses taken ranging from basic numeracy to advance business course resulting in financial literacy convergence of the students irrespective of their previous financial socialisation, hence, no statistical difference between male and female students. This is manifested in Ansong and Gyansere (2012) survey on determinants of financial literacy of working students at University of Cape Coast, Ghana. Though, the study observed differences in financial literacy between female and male students through responses of 109 business and 140 non-business students, and 107 male and 143 female students, the distribution of sample suggests that the differences could emanate from sampling error originating from the differences between business and non-business students.

Therefore, examining the differences in financial literacy between male and female of similar financial orientation is necessary to unfold the myth of sex and financial literacy.

This study examine gender differences in financial literacy randomly selected and 560 responded business students of School of Business, University of Cape Coast, Ghana. The intention is to provide a better understanding of the confounding issues of gender as a determinant of financial literacy. The results show that females and males financial literacy in basic computation, financial confidence, savings and planning do not significantly differ.

The rest of the paper is structured as follows; research methodology in terms of the research design, sampling, data collection and analytical method in the next section. This is followed by analysis, finding and discussion of the results and concluded in the final section.

## Research Methodology

*Study design and sampling procedure:* The study adopted a cross-sectional and quantitative survey covering business students of the University of Cape Coast. Ghana. This study employed proportionately stratified sampling technique to randomly selected 600 out of the target population of 1500 students distributed as 570 females and 930 males of School of Business, University of Cape, Ghana, reading Bachelor of Management Studies (BMS) and Bachelor of Commerce (BCom). The sample determination was guided by Bartlett, Kotrlik and Higgins (2001) minimum returned sample size determination table with 50% proportion ($p = 0.5$), margin of error of 0. 05 and expected non-response rate of 20%. A total of 560 responded and subsequently used for the analysis.

*Data and Data Collection*: The study employed a questionnaire modified from that one used by Lusardi and Mitchell (2007), Almenberg and Widmark (2011), Gathergood (2012), and Lusardi (2012) to assess or measure the financial literacy. The questionnaire consists of fifteen (15) questions of which three (3) elicit demographic and socioeconomic information such as sex, level of study and programme, and twelve (12) measuring financial literacy. The financial literacy was elicited through twelve (12) multiple-choice questions of the respondents' general knowledge on consideration for taking loan from a financial institution, timing of buying on credit, use of Automated Teller Machine (ATM), time value of money, account types, savings, investment return and risks and insurance. The questionnaires were initially piloted in twenty (20) non-business students and changes were made to some of the questions. The final approved questions were administered to randomly selected business students over a period of three weeks.

*Data Analysis Method.* Descriptive statistics were conducted to describe the background characteristics of the study sample. Data was organised and presented in frequency tables and proportionate counts. Bivariate analyses with Pearson's Chi-Square test and Fisher's exact test were used to identify the associations between variables and to compare financial literacy items and sex status of the respondent. Financial literacy index is measured as the total score was analysed with independent t-test. Predictive Analytics Software (PASW) for Windows application programme (version 17. 0) was used to carry out the analysis with 5% significance level.

## Results and Discussions

*Sample Characteristics.* The background characteristics of the study participants about sex status are presented in Table 1. The total sample included 560 business students from School of Business of University of Cape Coast. The majority (59. 9%) of the sample were male business students with female business students constituting (40. 1%). The difference reflects the male-female gap in tertiary education in Ghana. There were more BCom students (83. 9%) than BMS (16. 1%) participants. In all, most respondents (60%) were at level 400 and least at level 300 (4. 6%). A Chi-square goodness-of-fit test to compare the difference in proportion of male and female participants in the sample and the proportion of male and female students in the population indicates that there was no significant difference across the sample as compared with the population, $\chi^2(1, n = 560) = 1.321, p = .250$, as presented in Table 1.

Although the sampled participants take the same number of core finance courses such as

Quantitative Methods for Business, Financial and Investment Management, these courses are taken at different levels. In addition, optional courses of the participants might further deepen their understanding and appreciation of the financial concepts and applications which could affect the financial literacy level of the two groups. To ensure homogeneity of males and female with respect financial education, a bivariate analysis was conducted to compare the baseline characteristics between males and female's participants. The study found no statistically significant differences between the two subgroups in relation to a programme of study, $\chi^2(1, n = 560) = 2.834, p = .092, \quad Phi = .076$) and level of study $\chi^2(2, n = 560) = 3.316, p = .191, \quad Phi = .077$ (see Table 1). It implies that the two subgroups, males and females are homogeneous in terms of financial education. The control of programme and

level of study eliminates any biases, which might influence the difference or non-difference of the participant.

**Table 1. Background Characteristics of the Study Participants by Sex**

| Variable | Male | | Female | | Total | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | (%) | N | % | N | % | P-Value | Phi ($\phi$) | |
| **Sex Distribution** | | | | | | | | | |
| | 334 | (59. 6) | 226 | (40. 4) | 560 | (100) | . 250[a] | - | |
| **Programme of study** | | | | | | | | | |
| BMS | 46 | (13. 8) | 44 | (19. 5) | 90 | (16. 1) | . 072 | . 076 | |
| BCOM | 288 | (86. 2) | 182 | (80. 5) | 470 | (83. 9) | | | |
| **Level of Study** | | | | | | | | | |
| Level 200 | 108 | (32. 3) | 90 | (39. 8) | 198 | (35. 4) | | | |
| Level 300 | 16 | (4. 8) | 10 | (4. 4) | 26 | (4. 6) | . 191 | . 077 | |
| Level 400 | 210 | (62. 9) | 126 | (55. 8) | 336 | (60. 0) | | | |
| | | | | | | | | | |

## Gender and Financial Literacy

The analysis of gender differences in financial literacy was preceded as follows; first, we examine the performance difference of twelve exam-type financial literacy questionnaires and the averaged financial literacy of male and female.

Table 2 shows the relationship between gender status of the respondents against their literacy in various financial literacy dimensions. Table 2 reports the frequency, percentage of each question answered correctly by sex, test-statistics of Chi-Square Test of independents, p-value associated with Chi-Square and Phi, a measure of effect size. Regarding the question "*You recently won a lottery and have the following options to choose from. Which option would you prefer given that the prevailing interest rate is 25% p. a. ?",* a slight difference in literacy level between the male and female was observed in nominal terms but this difference was not statistically significant (35. 93% versus 38. 9. %; $P > 0. 05$). When posed the question "*In choosing among several banks on which one to take credit (loan), which of the following deserves primary attention?",* 71. 26% of male respondents answered correctly as against 63. 39% of female respondents. A test of significance of the observed difference with Chi-square showed that there was no significant difference in level of literacy between male and female at 5% significance level[ $\chi^2(1, n = 558) = 3.464, \ p = .063, \quad Phi = -.083$ ]. The effect size of the observed difference at 10% significance is -. 083, which is considered a very small effect using Cohen's (1988) criteria of. 10 for small effect, 30 for medium effect and . 50 for large effect. Similarly, question on ATM (*What is the first step in the use of the ATM service?)* saw slight observed differences between the correctly answered question by male and female respondents, which is statistically insignificant at 5% (91. 02% versus 95. 34, P>0. 05). The male respondents performed slightly better than the female respondent on the question "*Imagine you deposited money in a bank account at 12% interest rate, while the annual inflation rate was 18%. Do you think the money from*

*your account can buy more or less, or the same amount of goods/services on average now as a year ago?"* but statistically insignificant (54. 49% versus 51. 79%, p>. 05).

The dominance of male respondents was also observed in questions bothering interest on account [*Which account usually pays the MOST interest? (Male: 38. 9%versus female: 37. 5%, p=. 803)*]; bounce cheque [*When a cheque bounces, who, if anyone, is usually charged a fee? (*Male: 42. 51% versus female: 41. 96%, p=. 967)]; returns on Treasury Bill [*Let's assume that you invested GH¢1000 in treasury bills for two years. At the time of investment, T-Bill rate was stated at 8% interest rate. How much would you have at maturity of your investment?* (Male: 49. 70%versus female: 46. 36%, p=. 495*)] and* requirement for opening bank account [*Which of the following is not always a requirement for opening an account with a financial institution?* (Male: 71. 00% versus female: 65. 35%, p=. 187*)].* However, the observed differences were not statistically significant at 5% levels and the effect sizes as indicated by Phi ($\phi$) <. 10 in Table 2 signify very small effect.

Female respondents showed slight literacy over the males in deciding on when buying on credit is justified [*When do you think buying on credit is justified?* (Male: 91. 24% versus female: 95. 56%, p=. 074*) ];* determining on the reward for investing in shares [*What do you get in return if you invest in shares?* (Male: 38. 97% versus female: 40. 89%, p=. 715*)];* identifying the appropriate account for medium to long-term investment [*Which of the following accounts will you sign for when planning for medium to long term deposit?* (Male: 54. 94% versus female: 55. 11%, p=1. 00*)];* finally determining what is insurance is bought for [*Insurances is bought to* (Male: 40. 48% versus female: 42. 67%, p=. 671)].

### Table 2. Financial Literacy Dimension by Gender

| | | | Male N(%) | Female N(%) | Total | $\chi^2$ | p-value | Phi($\phi$) |
|---|---|---|---|---|---|---|---|---|
| 1 | *You recently won a lottery and have the following options to choose from. Which option would you prefer given that the prevailing interest rate is 25% p. a. ?* | | | | | | | |
| | | Wrong | 214 (64. 07) | 138 (61. 61) | 352 (63. 08) | | | |
| | | **Correct** | **120(35. 93)** | **86(38. 39)** | **206(36. 92)** | . 252 | . 616 | . 025 |
| | Total | | 334 | 224 | 558 | | | |
| 2 | *In choosing among several banks on which one to take credit (loan), which of the following deserves primary attention?* | | | | | | | |
| | | Wrong | 96(28. 74) | 82(36. 61) | 178(31. 90) | | | |
| | | **Correct** | **238(71. 26)** | **142(63. 3)** | **380(68. 10)** | 3. 464 | . 063 | -. 083 |
| | Total | | 334 | 224 | 558 | | | |
| 3 | *What is the first step in the use of the ATM service?* | | | | | | | |
| | | Wrong | 30 (8. 98) | 10(4. 46) | 40(7. 17) | | | |
| | | **Correct** | **304(91. 02)** | **214(95. 54)** | **518(92. 83)** | 3. 641 | . 063 | . 086 |
| | Total | | 334 | 224 | 558 | | | |
| 4 | *Imagine you deposited money in a bank account at 12% interest rate, while annual inflation rate was 18%. Do you think the money from your account can buy more or less, or the same amount of goods/services on average now as a year ago?* | | | | | | | |
| | | Wrong | 152(45. 51) | 108(48. 21) | 260(46. 59) | | | |
| | | **Correct** | **182(54. 49)** | **116(51. 79)** | **298(53. 41)** | . 293 | . 558 | -. 027 |
| | Total | | 334 | 224 | 558 | | | |

| 5 | Which account usually pays the MOST interest? | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Wrong | 204(61. 08) | 140(62. 50) | 344(61. 65) | | | |
| | | **Correct** | **130(38. 9)** | **84(37. 50)** | **214(38. 35)** | . 062 | . 803 | -. 014 |
| | Total | | 334 | 224 | 558 | | | |
| 6 | When a cheque bounces, who, if anyone, is usually charged a fee? | | | | | | | |
| | | Wrong | 192(57. 49) | 130(58. 04) | 322(57. 71) | | | |
| | | **Correct** | **142(42. 51)** | **94(41. 96)** | **236(42. 29)** | . 002 | . 967 | -. 005 |
| | Total | | 334 | 224 | 558 | | | |
| 7 | Let's assume that you invested GH¢1000 in treasury bills for two years. At the time of investment, T-Bill rate was stated at 8% interest rate. How much would you have at maturity of your investment? | | | | | | | |
| | | Wrong | 168(50. 30) | 118(53. 64) | 286(51. 62) | | | |
| | | **Correct** | **166(49. 70)** | **102(46. 36)** | **268(48. 38)** | . 465 | . 495 | -. 033 |
| | Total | | 334 | 220 | 554 | | | |

**Table2, Continued**

| 8 | Which of the following is not always a requirement for opening an account with a financial institution? | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Wrong | 96(29. 00) | 78(34. 67) | 174(31. 29) | | | |
| | | **Correct** | **235(71. 00)** | **147(65. 33)** | **382(68. 71)** | 1. 744 | . 187 | -. 060 |
| | Total | | 331 | 225 | 556 | | | |
| 9 | When do you think buying on credit is justified? | | | | | | | |
| | | Wrong | 29(8. 76) | 10(4. 44) | 39(7. 01) | | | |
| | | **Correct** | **302(91. 24)** | **215(95. 56)** | **517(92. 99)** | 3. 194 | . 074 | . 083 |
| | Total | | 331 | 225 | 556 | | | |
| 10 | What do you get in return if you invest in shares? | | | | | | | |
| | | Wrong | 202(61. 030 | 133(59. 11) | 335(60. 25) | | | |
| | | **Correct** | **129(38. 97)** | **92(40. 89)** | **221(39. 75)** | . 133 | . 715 | . 019 |
| | Total | | 331 | 225 | 556 | | | |
| 11 | Which of the following accounts will you sign for when planning for medium to long term deposit? | | | | | | | |
| | | Wrong | 149(45. 02) | 101(44. 89) | 250(44. 96) | | | |
| | | **Correct** | **182(54. 98)** | **124(55. 11)** | **306(55. 04)** | . 00 | 1. 00 | . 001 |
| | Total | | 331 | 225 | 556 | | | |
| 12 | Isurances are bought to | | | | | | | |
| | | Wrong | 197(59. 52) | 129(57. 33) | 326(58. 37) | | | |
| | | **Correct** | **134(40. 48)** | **96(42. 67)** | **230(41. 37)** | . 181 | . 671 | . 022 |
| | Total | | 331 | 225 | 556 | | | |

The overall gender difference was analysed by constructing the financial literacy index- the percentage of correct responses for each question. Our computation hinges on the Behrman et al. (2010) exposition that more sophisticated measures of financial literacy index perform about as well as the simple additive approach and such simple measure has been used in Hastings and Mitchell (2011). Table 3 shows the results of independent t-test to compare the mean scores of the financial literacy index between male and female respondents. The result showed that there was insignificant difference in mean scores for male ($M$= 56. 67, $SD$= 20. 34) and female [$M$= 56. 09, $SD$=23. 33; $t$ (421. 938) = . 302, $p$=. 732]. The result presented is based on Welch's corrected t-test due to the violation of the assumption of homogeneity of variance violated as per the Levene's test of equality of variance.

**Table 3. Financial Literacy by Gender**

|  | N | Mean | St. Deviation | t | p-value |
|---|---|---|---|---|---|
| Male | 331 | 56. 67 | 20. 34 |  |  |
| Female | 219 | 56. 09 | 23. 33 | . 302 | . 732 |

Levene's test of equality of Variance (F=5. 628, P-value=. 018)

## Discussion

This is the first study investigating the gender difference in financial literacy of homogeneous group using a sample from University of Cape Coast, Ghana. A total sample of 560 business students comprises 334 (59. 6%) male and 226(40. 4%) female students. The difference in proportion between males and females reflects the imbalance in the male-to-female ratio in tertiary institutions in Ghana and comparable to other findings in Ghana (Mireku, 2015). Generally, the study observes statistically insignificant relationship between male and female respondents in both financial literacy dimensions/items and the financial literacy index. This finding is contrary to the widespread belief that female display low level of financial literacy compared to males (Agarwalla, Barua, Jacob & Varma, 2015; Ansong & Gyansere; Lusardi et al, 2010; Mandell, 2008). The results showed that out of twelve financial literacy questions, females outperformed the male counterpart in six whilst the male dominated in six. The finding from this homogeneous group suggests that male and female business students exhibit a similar level of financial literacy. The convergence of financial may emanate from common courses in finance and other finance related course taken. It can be argued that the observed difference in financial literacy between male and female is due to sampling biases or difference across the sample due to education, financial orientation and other socioeconomic characteristics. Males from different socioeconomic background could as well exhibit such differences in their level of financial literacy. This proposition supports the findings of insignificant difference observed by Wagland and Taylor (2009) studies of financial literacy of undergraduate business students at University of Western Sydney, Australia.

Notwithstanding the insignificant differences observed, the nominal figures present interesting findings for discussion. For instance, there was male dominance in three out of four calculation questions, which lend some credence to males' superiority in computational ability (Yu, Wu & Chun, 2014). In spite of the homogeneity within the group and having gone through similar courses, male still exhibits slightly high computational ability. This may be attributed to late financial socialisation and the insignificance suggests catching-up of females in computational ability. The females, however, dominated by non-computational financial literacy dimensions, which are widely agreed

procedures and rules, when followed to connote financial literacy. The female's advantage in recall of these procedures and rules supports Herlitz et al (1999) observation that female is more accurate than male in recalls. The effect sizes in all cases are very small which suggest diminishing differences due to the homogeneous nature of the sample. And most importantly, the dominance of the male in financial literacy is not supported.

## Conclusion and Implications

Gender difference favouring a male in financial literacy had been found in a number of studies. In this paper, we showed there is insignificant difference in financial literacy between male and female business students from the University of Cape Coast. The male respondents were found to have the advantage in computational ability whilst the females are advantaged in non-computational ability. This observed nominal difference was, however, found not to be significant through Chi-square test of independence and independent t-test.

The implication is that, financial education has bridges financial literacy. It also suggests that irrespective of one's financial orientation or experience, subsequent financial education is capable of bridging the literacy gap. This is important in the policy to bridge the gender gap in financial literacy.

## Bibliography

Agarwalla, S.K.; Barua, S.K.; Jacob, J. & Varma, J.R. (2015). Financial Literacy among Working Young in Urban India. *World Development*, Vol. 67, pp. 101-109.

Agnew, S. & Cameron-Agnew, T. (2015). The influence of consumer socialisation in the home on gender differences in financial literacy. *International Journal of Consumer Studies*, 39(6), pp. 630-638.

Almenberg, J. & Widmark, O. (2011). *Numeracy, financial literacy and participation in asset markets*. Available at SSRN 1756674.

Ansong, A. & Gyensare, M.A. (2012). Determinants of university working-students' financial literacy at the University of Cape Coast. Ghana. *International Journal of Business and Management*, 7(9), pp. 126-133.

Bartlett, J.E. II, Kotrlik J.W., & Higgins C.C. (2001). Organizational research: Determining appropriate sample size in survey research. *Inform Tech Learn Perform J*, 19(1), pp. 43-50.

Behrman, J.R.; Mitchell, O.S.; Soo, C. & Bravo, D. (2010). *Financial literacy, schooling, and wealth accumulation*. No. w16452. *National Bureau of Economic Research*.

Chen, H. & Volpe, R.P. (2002). Gender differences in personal financial literacy among college students. *Financial services review*, 11(3), pp. 289-307.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. 2nd ed. Hillsdale, NJ: Erlbaum.

Gathergood, J. (2012). Self-control, financial literacy and consumer over-indebtedness. *Journal of Economic Psychology*, 33(3), pp. 590-602.

Goldsmith, E. & Goldsmith, R.E. (1997). Gender differences in perceived and real knowledge of financial investments. *Psychological Reports*, 80(1), pp. 236-238.

Hastings, J.S. & Mitchell, O.S. (2011). How financial literacy and impatience shape retirement wealth and investment behaviors. No. w16740. *National Bureau of Economic Research.*

Herlitz, A.; Airaksinen, E. & Nordström, E. (1999). Sex differences in episodic memory: the impact of verbal and visuospatial ability. *Neuropsychology*, 13(4), pp. 590-597.

James, E. (2009). The Case for Financial Literacy in Developing Countries. *World Bank/OECD/DFID.* Online Available: http://www. oecd. org/dataoecd/35/32/43245359. pdf. March 6, 2011.

Lusardi, A. (2012). *Numeracy, financial literacy, and financial decision-making*. No. w17821. *National Bureau of Economic Research.*

Lusardi, A. & Mitchell, O.S. (2007). Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of monetary Economics*, 54(1), pp. 205-224.

Lusardi, A.; Mitchell, O.S. & Curto, V. (2010). Financial literacy among the young. *Journal of Consumer Affairs*, 44(2), pp. 358-380.

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.

Mireku, K. (2015). Financial literacy among University students: evidence from Ghana. *Doctoral dissertation*, Department of Accounting and Finance, Kwame Nkrumah University of Science and Technology.

Olga, K. (2011). Financial literacy in Ukraine: Determinants and implications for saving behaviour. *Unpublished master's thesis.* Kyiv School of Economics.

Schubert, R.; Brown, M.; Gysler, M. & Brachinger, H.W. (1999). Gender and economic transactions-Financial decision-making: Are women really more risk-adverse? *The American Economic Review*, 89(2), pp. 381-385

Van Rooij, M.C.; Lusardi, A. & Alessie, R.J. (2012). Financial literacy, retirement planning and household wealth. *The Economic Journal*, 122(560), pp. 449-478.

Volpe, R.P.; Kotel, J.E. & Chen, H. (2002). A survey of investment literacy among online investors. *Journal of Financial Counseling and Planning*, 13(1), p. 1.

Wagland, S.P. & Taylor, S. (2009). When it comes to financial literacy, is gender really an issue?. *Australasian Accounting, Business and Finance Journal*, 3(1), pp. 13-27.

Yu, K. M.; Wu, A.M.; Chan, W.S. & Chou, K.L. (2015). Gender differences in financial literacy among Hong Kong workers. *Educational Gerontology*, 41(4), pp. 315-326.