

Gendered-Analysis on Research Competency of 21st Century Learners

**Jun S. Camara, PhD¹, Edwin C. Cancino, PhD², Christy Ann M. Rahon³,
Elsa Q. Terre, EdD, PhD⁴, Randy Joy M. Ventayen, DBA, DIT⁵,
Mary Jane U. Quibilan, PhD⁶, Jomar M. Urbano⁷**

¹Faculty, Pangasinan State University, Lingayen Campus, Pangasinan, Philippines

²Faculty, King Faisal University, Kingdom of Saudi Arabia

³Faculty, Mariano Marcos State University, Ilocos Norte, Philippines

⁴Faculty, Pangasinan State University, Asingan Campus, Pangasinan, Philippines

⁵Faculty, Pangasinan State University, Lingayen Campus, Pangasinan, Philippines

⁶Faculty, Pangasinan State University, Asingan Campus, Pangasinan, Philippines

⁷Faculty, Nueva Ecija University of Science and Technology, Nueva Ecija, Philippines

Email: jcamara@psu.edu.ph

Abstract: Gender influence on research competency, though important, is less explored compared with other academic disciplines. This study aimed to compare both genders in their perceived level of research competency. The study utilized a descriptive-status research design which employed a validated survey questionnaire administered digitally all over the Philippines from October to November 2020. Participated in by 1, 220 participants from 9 regions and 27 provinces in the Philippines, the study revealed that both genders consider themselves as ‘Highly Competent’ in research, with the female respondents more competent than the male respondents in terms of writing. Findings revealed areas of strength and weaknesses in research instruction and national and international implications for these findings were noted. The authors recommended several measures to address these issues.

Keywords: Gender Dimension, K to 12, Research Competency, Senior High School, Updates.

1. INTRODUCTION

Goal number 3 of the 8-agenda-2015 Millennium Development Goals (MDG) aimed to promote gender equality and empower women, specifically (Target 3.1) to eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015. In the report of the United Nations on this target in 2015, one the findings resolved that developing countries, generally, have achieved the target. However, women continue to experience significant gaps in terms of poverty, labor market and wages, as well as participation in private and public decision-making. When the 15-year MDG ended in 2016, the world leaders adopted at the United Nations the Sustainable Development Goals (SDG) of 2030, as a shared vision of humanity and, to borrow the words of UN Secretary-General Ban Ki-moon, ‘a shared contract between the world’s leaders and the people’.

Gender Equality in the 2030 SDG is Goal number 5, and the goal target most related to the study is target number 5.C which states ‘adopt and strengthen sound policies and

enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels'. While much of the gender equality issues focus on the women participation to various social, political and economic aspects, the quality of education among both genders need to be addressed as well. Though quality education, gender issues are addressed and are resolved – maybe not in this time, but progressive techniques will do in the future. How is gender dimension addressed by the world of the contemporary times?

Diversity improves the collective intelligence of a research group. It does not only enhance creativity but also provides new contexts for understanding the societal relevance of the research itself. One of the key aspects of diversity is gender. Gender affects all facets of life and the world of research presents no exception. Men and women differ in the way they act, write, communicate, think and speak. These gender differences in the aspects mentioned have implications for gender differences across research competency of men and women. Based from the results of the present study, it was revealed that there is significant difference between the research competency of the male and female in most of the areas which are important to consider in conducting research studies qualitatively and quantitatively except for writing specific problems. There is really gender differences as to participants 'competence in research such as their ability to explain, identify, differentiate, compute and write research-related tasks for qualitative and quantitative research studies.

Language which is used by people is determined by social classification such as gender, social class, age, ethnicity, education. One of the socio-cultural factors shaped by learners in the process of learning a language including writing is gender. The term "gender" clearly reveals the social and contextual expectations which society puts on part of each gender (male or female) culturally and socially ((Kamiar, Gorjian, & Pazhakh, 2012).

Kamiar et al., (2012) in their research on 150 BA students of Islamic Azad University of Ahvaz majoring in Teaching English as a foreign Language (TEFL), compared both genders in terms of proficiency in writing descriptive paragraph and their opinion on paragraph. The results showed the superiority of writing skill of male students on opinion paragraph essay and superiority of female students on descriptive one. According to findings of Kamari et al., (2012), males are good writers on opinion related- subjects because of their ability in expressing their opinions and ideas.

According to the latest report of European Commission in 2012, only 33 % of European researchers were women. This percentage tends to be even lower in typically male-dominated fields. Throughout the years, it was stated that women have been historically under-represented at the head of higher education institutions. These findings are utterly disappointing as, in 2012, the percentage of female European PhD graduates amounted to 47%.

The study of Besselaar & Sandström (2015) on the performance differences between male and female researchers, and the change of performance differences during the early career, the results showed that male careers developed much faster than female researchers' careers; but controlling for performance differences, it also revealed that gender is also an important determinant.

The data analysis in the study conducted by Jafari and Ansari (2012) on the effect of collaboration and gender on Iranian EFL learners' writing accuracy indicated that the students in the collaborative writing group outperformed the students in the control group. Moreover, based on data, the females in the collaborative group outperformed males in the same group indicating that gender has a pivotal role in Iranian EFL collaborative writing.

In another study conducted by Gorjian et al., (2012), they attempted to find out whether critical thinking instruction affect Iranian EFL male and female students' descriptive writing and if there is a significant gender difference in strategy use in the writing performance. The results showed that critical thinking instruction had a significant effect on improving Iranian

EFL students' descriptive writing and there were significant differences on the effective use of critical thinking instructions with regard to gender in descriptive writing test performance.

In our attempt to propose a more integrated research curricula that is gender-sensitive, this gendered-analysis presents findings from a nationwide survey in the Philippines, with the end in mind of understanding behavioral differences of the male and female with respect to their perceived abilities in research.

2. METHODOLOGY

Research Design and Sampling Technique. This study employed descriptive-status type of research because (descriptive) it attempts to observe and measure the characteristics of the research participants without any form of intervention or manipulation to any prevailing conditions that affect them but (status) with possibility that these characteristics may be different with other populations and with the fact that these characteristics are present to the population under the study and during the data-gathering period. The sampling technique employed is simple random sampling for convenience and for wider geographical reach especially at a time when mobility of researchers is limited or restricted by Philippine IATF guidelines relative to the control of covid-19 pandemic.

Population and Instrumentation. The population of interest are (1) Filipino K to 12 graduates who are (2) enrolled in college during the data-gathering period. In this study, 1, 271 students participated but only 1, 250 of their responses were considered as data, because the remaining 21 responses were college students but were not K to 12 graduates. The research instrument is self-developed by the lead researcher. It is composed of 2 major parts. Part 1 included questions on the personal profile of the research participants including a few questions on their research profile as K to 12 graduates. Part 2 included questions on research competency questions relative to research writing. The research instrument underwent 2 major revisions and was finally rated as 'Very Highly Valid' ($M=4.51$) by experts of the Philippine Association of Research Practitioners, Educators and Statistical Software Users (PARESSU), Inc [SEC RN: CN2019001170]. The Ethics Board of the PARESSU, Inc rated it 'Approved for Administration' dated October 10, 2020. Further, of the 1, 250 responses, only 1, 220 responses were considered, as explained later.

Data-gathering Procedure and Data Analysis. The data-gathering technique employed is the survey-questionnaire technique which was administered digitally all over the Philippines from October 15 to November 15, 2020 primarily through Messenger and Gmails. Further, a social media invitation with the link of the google form was also posted on the website of PARESSU, Inc to ensure that every netizen who possessed the inclusion criteria is given an opportunity to participate in the study. For data analysis, the data for this excerpt – were subjected to simple frequency counts, average weighted mean, chi-square test of independence (crosstab) using SPSS v25.

3. RESULTS AND DISCUSSION

Geographic Distribution. In terms of regional distribution, there were nine (9) regions which participated in the study. Majority of the participants came from Region I (802, 64.2%). Regions II, III, IV-A and NCR had more than 100 participants, while a few came from Regions IV-B, V, CAR, X.

In terms of provincial distribution, there were twenty-seven (27) provinces which participated in the study. Majority of the participants were from Pangasinan (713, 57.0%). Nueva Ecija, Manila, Ilocos Norte, and Rizal had more than 50 participants. There were participants from La Union, Abra, Mountain Province, Tarlac, Benguet, Bulacan, Misamis Oriental, Ilocos Sur, Aurora, Camarines Sur, Pampanga, Zambales, Apayao, Cavite, Laguna, Bataan, Cagayan, Romblon, Pasay, Ifugao, Nueva Vizcaya, and Isabela. In terms of municipal, university and course distribution, requests for data could be made to the author/s – but for this article, these are not reported to ensure privacy of the participants.

Gender Distribution

<i>Gender</i>	<i>Frequency (f)</i>	<i>Percentage (%)</i>
Male	437	35.0
Female	783	62.6
Preferred Not to Say	30	2.4
<i>Total Respondents</i>	1, 250	100.0
<i>Final total</i>	1, 220	97.6

In terms of gender distribution, there were 783 female respondents (62.6%) and 437 male respondents (35.0%). A very few of the participants preferred not choosing between the options male or female, and the researchers decided to remove these responses during the analysis. A total of 1, 220 responses were subjected to analysis, which represented the majority (97.6%).

Gendered Analysis on Research Competency of Male and Female 21st Century Learners

<i>No</i>	<i>Competency</i>	<i>Mean (Male)</i>	<i>Mean (Female)</i>	<i>X²</i>
1	I can explain the importance of Qualitative research in daily life.	3.53 <i>HC</i>	3.76 <i>HC</i>	30.857*
2	I can explain the importance of Quantitative research in daily life.	3.48 <i>HC</i>	3.72 <i>HC</i>	29.864*
3	I can identify the characteristics of research.	3.52 <i>HC</i>	3.76 <i>HC</i>	37.793*
4	I can identify the different processes of research.	3.48 <i>HC</i>	3.73 <i>HC</i>	40.153*
5	I can identify the different ethical principles in doing research.	3.36 <i>C</i>	3.63 <i>HC</i>	54.797*
6	I can differentiate a qualitative from a quantitative research.	3.82 <i>HC</i>	4.11 <i>HC</i>	38.529*
7	I can identify the different kinds of Qualitative research.	3.42 <i>HC</i>	3.74 <i>HC</i>	64.428*
8	I can identify the different kinds of Quantitative research.	3.41 <i>HC</i>	3.70 <i>HC</i>	64.659*
9	I can write a good research title.	3.50 <i>HC</i>	3.64 <i>HC</i>	10.666*

10	I can write a good chapter 1.	3.52 HC	3.71 HC	24.011*
11	I can write a good chapter 2.	3.44 HC	3.65 HC	25.983*
12	I can write a good chapter 3.	3.38 C	3.56 HC	19.281*
13	I can write a good chapter 4.	3.37 C	3.53 HC	17.248*
14	I can write a good chapter 5.	3.39 C	3.57 HC	19.733*
15	I can select relevant studies for my research.	3.50 HC	3.71 HC	21.989*
16	I can write correct general problem.	3.45 HC	3.56 HC	15.935*
17	I can write correct specific problems.	3.49 HC	3.58 HC	9.337 ^{nsd}
18	I can choose appropriate methodology for my study.	3.41 HC	3.57 HC	19.839*
19	I can compute correct sampling method.	3.35 C	3.47 HC	21.936*
20	I can compute correct statistical tool.	3.32 C	3.42 HC	17.252*
21	I can write correct bibliographical references.	3.48 C	3.73 HC	31.820*
22	I can write correct synthesis of reviewed studies.	3.32 C	3.50 HC	28.496*
23	I can write correct findings.	3.41 HC	3.55 HC	13.146*
24	I can write correct conclusions.	3.54 HC	3.74 HC	25.573*
25	I can write correct recommendations.	3.58 HC	3.78 HC	25.933*
26	I can write a correct abstract.	3.46 HC	3.61 HC	16.299*
	<i>Weighted Mean</i>	3.46 HC	3.66 HC	
	<i>Very Highly Competent (4.21-5.00); Highly Competent (3.41-4.20); Competent (2.61-3.40); Moderately Competent (1.81-2.60); Not Competent (1.00-1.80)</i>			
	<i>* (With Significant Difference); ^{nsd} (No Significant Difference)</i>			

Report of High Perceived Competency of both genders. In general, both males and female respondents reported a high perceived competency in their understanding of and skills in doing senior high school research. However, table 2 shows that between males and females, there is a significant difference in almost all areas covered, in favor of females. An exception is on perceived ability to write correct specific problems, where there is a nonsignificant difference, although females had a higher perception of competency than males did. Overall, females had a higher perception of research competency than did the males.

Although these results reflect gender differences in perceived research competence, these are nonetheless consistent with the findings of Reilly, Neumann, and Andrews (2019). In

the researchers' meta-analysis of reading assessment data and writing achievement from the National Assessment of Education Progress (NAEP) from 1988-2015 and 1988-2011, respectively, they found that females outperformed males in both reading and writing achievement (Reilly et al., 2019). These observations are not isolated in the USA alone. In fact, the results of PISA 2018 on reading show that this difference in reading achievement is universal across cultures (OECD, 2020). These findings are important since reading and writing are interrelated (IRA, n.d.), and that extensive reading improves writing abilities of ESL learners (Aida & Widiyati, 2020). Research is a reading and writing intensive intellectual pursuit, and it can be argued that students' competence in reading and writing may be reflected in their perceptions of research competence. Whether this translates to objective measurements of research competence among senior high school students must be explored in future studies. ***Female had higher perceived research competence than males in terms of writing.*** In all items in the questionnaire related to writing, female respondents had a higher perceived research competence than males. This may be explained in part by the relationship between language proficiency and writing quality. Al-Saadi (2020) found that girls' significant outperforming of boys in text quality can be mediated by language proficiency, an area where girls also outperformed boys. It should be noted, however, that the participants in Al-Saadi's (2020) study were English as a Foreign Language learners, whereas, participants in the present study were English as a Second Language Learners. Similarly, Van der Slik, Van Hout, and Schepens (2015) showed that this gender difference in writing proficiency also exists in favor of females among a large sample of learners of Dutch as a second language, who are of diverse nationalities and mother tongues (Van der Slik, Van Hout, & Schepens, 2015). However, Van der Slik et al. (2015) found no gender difference in terms of reading.

Various ideas attempt to explain these gender differences in reading and writing, and by extension, high school research competence. One aspect that can explain this is motivation. In a study of Chilean children, females had a higher motivation for reading than males (Espinoza & Strasser, 2020). This can be further explained by respondents' gender stereotyping of reading, which is thought of as a more feminine than a masculine activity (Espinoza & Strasser, 2020). It could be that the female respondents in the present study have read more extensively than the males did, leading to a higher perception of research competency in females as compared to males.

International Implications on Gender Dimension

The results also showed that both gender identities consider themselves as Highly Competent in Senior High School Research with the female obtaining higher weighted mean. Twenty first century learners all over the world are now research-oriented and they use their skills for innovations and inventions. No wonder that young learners can do a lot of extraordinary discoveries. With the aid of high technology, nobody is exempted to take challenge of being competent globally in the field of research.

On the other hand, Reynolds (2015) noted that the issue of gender differences in writing skills has been overlooked because it is less frequently measured in educational assessments. In cases where writing ability is assessed, researchers examine gender differences to determine if any meaningful differences occur. Also, the term "gender gap" has most often been applied to women, the benefit that sex- and gender-based analysis will help for understanding of men's issue. Despite the increasing representation of male and female subjects in research and reporting of sex specific and gender-specific data, these examples indicate that existing policies have not been enforced (Heidari, 2016). Thus, it implies that the world needs more researchers focusing on the gender differences on research competence.

The result of the study that female K to 12 graduates are more competent in terms of identifying research problems and relevant studies conforms to the findings of Ain, Sabir, & Willison (2019) in which women gave a greater emphasis and comments on the embarking and clarifying skills. Embarking and clarifying skills pertain to how a student responds to initiate research and clarify what knowledge is required considering ethical, cultural, and socio factors (Willison, 2020). Contradictory, in the study conducted by Wright & Holttum (2012), among clinical psychology trainees in UK, males have a stronger intention to do research and have stronger liking for self-efficacy scores. This is probably due to the culture in research that men receive more research grants than women in the UK (Ag Ayoya & et. al., 2012).

In the study, females scored significantly higher in terms of their knowledge in conducting qualitative and quantitative research. The higher inclination to conducting qualitative research can be attributed to better communication and verbal skills among women (Hyde, 2014). Women are also more interested to people than men (Hyde, 2014) and more sensitive and emotionally tuned (Edwards & Hamilton, 2004).

The study shows that females are more competent in computing for sampling method and statistical tools, which differs from research trends that males have higher mathematical ability than females. Ain, Sabir, & Willison (2019), found out that male and female researchers and students are similar in finding information and generating data using appropriate methodology. This characteristic can be linked to the students' critical thinking skills and analytical skills. In the study conducted by Shubina & Kulakli (2019), males have lower inference level and level of deduction than females. Both are facets of critical thinking.

International Implications on Basic and Higher Education

In the PISA 2018 National Report of the Philippines published in December 2019, the Department of Education found that female students performed significantly better (27-point difference) than male students in overall reading literacy, significantly higher (12-point difference) as well in average mathematical literacy than male students, and significantly higher (4-point difference) too in average scientific literacy though not statistically different. The findings of the study that the male and female participants view themselves as 'Highly Competent' find implications to such a finding. While in the academic discipline, the genders defer, in terms of research competency they are similar (highly competent). This could imply that research as a subject is gender-friendly, and/or research subjects including instruction, activities, guideline son outputs are gender-free.

Conducting research studies for global competence can promote cultural, social awareness and respectful interactions in increasingly diverse societies. Nowadays, research competence has an important role to suffice the needs of an interconnected, diverse and rapidly changing world. The emergence of many creative digital applications despite gender differences in terms of our orientation in research is an indication that the kind of education we have all over the world has been leveling up.

The level of competence among 21st century learners in research vary regardless of gender differences depending on their writing skills and interests. Recognizing that gender equality is essential to ensure that men and women can develop their full potential in the digital world. Hence, educators in this generation must be equipped with very high research competence too to give enough research skills needed by the young researchers.

More seminars and trainings in research should also help all individuals, i.e. both men and women, both learners and educators to acquire the research skills needed to become globally research oriented and experts.

4. CONCLUSIONS AND RECOMMENDATIONS

Competence in research open networks, partnerships and open engagement in an international society. The finding that both gender identities consider themselves as highly competent in research implies competitiveness and comparability in terms of emerging demands for 21st century global learners. Governments should cooperate to invest and enact support policies for inter-regional/national learning and research opportunities for students. In the face of increasingly uncertain and diverse world, high research competency can make a difference as to whether students can thrive and shape the world to ensure sustainability of knowledge society, environment, people, peace, and business through global partnerships and initiatives.

As the higher education system operates in a changing and challenging environment, its roles of instruction, research, engagement and production requires that providers should ensure interconnectedness of these roles. The finding showing that both gender identities consider themselves as highly competent in research implies that students can learn more and better using research-based learning. Higher education then need to innovate and construct flexible teaching strategies and learning activities other than lecture sessions. The structure and design of curricula should incorporate research-led teaching-learning strategies and assessment such as project-based, problem-based, and case studies. In Japan, the new educational policy aims to emphasize on problem-solving abilities and moving towards active learning and deep learning (OECD, 2018). The students' research competency should be linked to a more innovative teaching beyond traditional classroom lectures. In addition, recognition of research outputs as equivalent credits in degree acquisition must be developed and recognized in higher education. In this era of scientific knowledge explosion and growing societal problems, it is appropriate that curricula should continue to evolve where teaching-learning should be research-led. Finally, it is recommended that gendered-research competence is correlated with the awards, strand, spirality, and alignment (Camara, 2020). This way, gender could be seen as a moderator variable of research competency.

Conflict of Interests

The authors stated no conflict of interests.

Acknowledgements

The authors would like to acknowledge the assistance during data-collection of Mr. Arvin Sammy D. Rivo of a school in Dagupan City, Philippines, as well as Mr. Terence M. Lapeñas of University of Sto. Tomas, Vemma Mae R. Guinto of Pangasinan State University Bayambang, and Mr. Adrian R. Manaois of Pangasinan State University Urdaneta, for their assistance in data coding and tabulation.

REFERENCES

- [1] Ag Ayoya, M., & al., e. (2012). Gender inequality in awarded research grants. *The Lancet*, 380, 474.
- [2] Ain, C. T., Sabir, F., & Willison, J. (2019). Research skills that men and women developed at university and then used in workplaces. *Studies in Higher Education*, 44(12), 2346-2358.
- [3] Aida, S. N., & Widiyati, E. (2020). Extensive reading to improve students' writing of explanation text. *Journal of English Education, Literature, and Culture*, 5 (1), 109-117. DOI: 10.30659/e.5.1.109-117
- [4] Al-Saadi, Z. (2020). Gender differences in writing: The mediating effect of language proficiency and writing fluency in text quality. *Cogent Education*, 7:1, 1770923. DOI:10.1080/2331186X.2020.1770923

- [5] Camara, J. S. (2020). Post-evaluative insights among Filipino Engineering Students on Alignment, Spirality, Strand and Awards (ASSA) in K to 12 Implementation. *International Journal of Scientific and Technology Research*, 9(2).
- [6] Department of Education. PISA 2018 National Report of the Philippines.
- [7] Edwards, R., & Hamilton, M. (2004). You need to understand my gender role: an empirical test of tannen's model of gender and communication. *Sex Roles*, 50(7-8), 491-504.
- [8] Espinoza & Strasser (2020). Is reading a feminine domain? The role of gender identity and stereotypes in reading motivation in Chile. *Social Psychology of Education*, 23: 861-890. DOI: <https://doi.org/10.1007/s11218-020-09571-1>
- [9] European Institute for Gender Equality. (2016). Integrating gender equality into academia and research organisations: Analytical Paper. Retrieved from https://eige.europa.eu/sites/default/files/documents/20186141_mh0518041enc_002_pdf.pdf
- [10] Gorjian, B., Pazhakh, A., & Parang, K. (2012). An investigation on the effect of critical thinking (CT) instructions on Iranian EFL learners' descriptive writing: A case of gender study. *Advances in Asian Social Science*, 1(1), 114- 118.
- [11] Hyde, J. S. (2014). Gender similarities and differences. *Annual Review of Psychology*, 65(3), 3.1-3.26.
- [12] International Reading Association (2012). The Reading-Writing Connection. Retrieved from <https://files.eric.ed.gov/fulltext/ED571549.pdf> on February 2, 2021.
- [13] Jafari, N., & Ansari, N. A. (2012). The effect of collaboration on Iranian EFL learners' writing accuracy
- [14] Kamari, E., Gorjian, B., & Pazhakh, A. (2012). Examining the effects of gender on second language writing proficiency of Iranian EFL students: Descriptive vs. opinion one-paragraph essay. *Advances in Asian Social Sciences (AASS)*, 3(4).
- [15] OECD (2019). Girls' and boys' performance in PISA in PISA 2018 Results (Volume II): Where All Students Can Succeed. OECD Publishing, Paris. DOI: <https://doi.org/10.1787/f56f8c26-en>
- [16] OECD 2018. Education Policy in Japan: Building Bridges Towards 2030
- [17] Piraksa, C., Srisawasdi, N., & Koul, R. (2014). Effect of Gender on Students' Scientific Reasoning Ability : A Case Study in Thailand. *Procedia - Social and Behavioral Sciences*, 116, 486 - 491.
- [18] Reilly, D., Neuman, D. L., & Andrews, G. (2019). Gender Differences in Reading and Writing Achievement: Evidence from the National Assessment of Educational Progress (NEAP). *American Psychologist*, 74 (4), 445-458. <http://dx.doi.org/10.1037/amp0000356>
- [19] Reynolds, M. R., Scheiber, C., Hajovsky, D. B., Schwartz, B., & Kaufman, A. S. (2015). Gender differences in academic achievement: Is writing an exception to the gender similarities hypothesis? *The Journal of Genetic Psychology*, 176, 211-234. <http://dx.doi.org/10.1080/00221325.2015.1036833>
- [20] Shubina, I., & Kulakli, A. (2019). Critical thinking, creativity and gender differences for knowledge generation in education. *Literacy Information and Computer Education Journal (LICEJ)*, 10(1), 3086.
- [21] Willison, J. (2020). The Models of MELT. Retrieved from Models of Engaged Learning and Teaching: <https://www.adelaide.edu.au/melt/the-models-of-melt#the-melt-conference>
- [22] Wright, A. B., & Holttum, S. (2012). Gender identity, research self-efficacy and research intention in trainee clinical psychologists in the UK. *Clinical Psychology and Psychotherapy*, 19, 46-56.