Research Article

Research Skills Assessment of Teacher Education Students in Dagupan City

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ABSTRACT

This study aimed to assess how the Methods of Research course would improve the research skills of teacher education students by comparing their research skills before and after taking the said course. This study utilized an explanatory sequential mixed method research design where the researchers gathered and analyzed quantitative data then further conducted qualitative research to help explain the quantitative part in more detail. Quantitative data were analyzed through statistical analysis, whereas qualitative data were utilized as explanatory statements for the findings of the study. Findings reveal that the students had the medium ability on various research skills before taking up their Methods of Research course; but after one semester of being enrolled in the course, the students improved and showed high ability. Overall, the levels of research skills of the students before and after they took the course exhibited a significant increase in most of the required skills. This implies that the students had considerable improvement in their research skills after taking up the Methods of Research course. The researchers conclude that there was a significant improvement in the research skills of the teacher education students after the course. Factors that highly influenced the participants' improvement in their research skills were teaching strategies apt to the students' learning styles, strengths, and weaknesses, interest and self-confidence, and time management. Thus, this study recommends the Methods of Research instructors utilize innovative teaching strategies that will adjust to the strengths and weaknesses of the students to improve their learning on research.

KEYWORDS

Research Skills, Teacher Education, Methods of Research

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INTRODUCTION

One of the critical challenges in education is integrating research into students' education. As Walliman (2011) mentioned, research is "any investigation intended to uncover interesting or new facts" (p. 1). Grinnell and Unrau (2019) emphasized that research is a scientific inquiry that systematically solves issues and problems to provide worthy information and knowledge. One way of expanding students' learning is taking up Methods of Research course in their program. This course prepares students for their thesis writing that is ideally taken in the following semester. Generally, the Methods of Research course is intended to equip the students to articulate the phases of the research process, submit action research, and critique a research study. The integration of research in teaching in the college is aligned with the university's objective to actively provide venues for stimulating new ideas and discoveries that lead to innovations and technologies and strengthen students' knowledge, skills, and experience. Since education is considered significant in promoting development, there is a need to strengthen the research methods course to improve the research capability of students, specifically teacher education students.

This study primarily assessed the effectiveness of the Methods of Research subject of Teacher Education students in Dagupan City, Philippines. Specifically, it sought to address the following objectives: (1) to determine the level of research skills of teacher education students before taking their Methods of Research subject; (2) to assess the capability of teacher education students in terms of their research skills after taking Methods of Research subject; (3) to determine whether there was a significant change on the research skills of the respondents before and after the Methods of Research subject; (4) to identify factors influencing change in the research skills of the students enrolled in the Methods of Research course subject; and (5) to be able to determine innovative strategies of faculty members teaching Methods of Research course subject.

This study was deemed essential for other universities because they can use the results of the study to improve their Methods of Research course. Determining the level of the research capability of students before and after taking the Methods of Research subject will help their respective colleges identify teaching strategies or techniques to improve the course. The design and result of this study can also be relevant for other colleges that wish to enhance their research methods courses.

The Faculty of General Dental Practice (FGDP, 2007) has presented a framework of research competencies composed of five domains of practical skills. The first domain encompasses basic skills, including finding and using resources, using the library and information technology effectively, recognizing resources, observing behaviors, and demonstrating basic computer literacy. The second domain is problem-solving and

communication skills, where one is expected to understand, recognize, evaluate, generate objective information. Meanwhile, the third domain of research skills concerns professional ethics; it shows awareness of and adherence to the ethical principles underlying research activities. The fourth domain, dissemination, demonstrates the basic skills to present findings in podium/poster presentations and/or publications. Lastly, a researcher is expected to engage in activities that contribute to knowledge development, address significant issues, and help and support other researchers. These practical skills, in addition to the student's study skills like reading and writing skills, were viewed by Huddleston et al. (2020) to increase the research capabilities of the student.

However, Huddleston et al. (2020) mentioned that aside from these practical skills, critical thinking is also one of the essential skills in research. This allows the researcher to seek relevant information from various sources to develop an "informed point of view" (University of Louisville Libraries, n.d.; Wallman et al., 2012). Moreover, critical thinking enables the researcher to learn and think independently and articulate his opinions backed up by existing supporting evidence.

In addition to the practical skills presented by the FGDP (2007) and Huddleston et al. (2020), Showman et al. (2013) identified five essential skills for every undergraduate researcher: creativity, judgment, communication, organization, and persistence. Creativity requires originality; thus, striving to conduct research in line with their discipline will spark their creativity for possible ideas. It is also vital for undergraduate researchers to develop good judgment as it applies to ethical issues and concerns in research. Students should take time to learn about ethical dilemmas related to their respective fields or discipline so that they can utilize their considered judgments to arrive at proper, safe, and righteous conclusions. Additionally, Showman et al. (2013) refer to communication as "the set of skills necessary to develop and maintain an effective relationship between an undergraduate researcher and his or her faculty mentor" (p.17). This can be intimidating to the students during the first stage of their undergraduate research process, but proper communication between the teacher and the student must be kept to develop and improve the research. Their study also pointed out that organization skills can easily help students schematize their ideas. These skills can make the difference between a solid report and an unsupported essay. Furthermore, persistence will drive the investigation and will not let undergraduate researchers give up despite all the failures and hardships in the research process.

Some research skills studies used students' self-assessment (McMillan & Hearn, 2008), while others focused on teachers' assessment of their students (Stokking, Schaaf, Jaspers, & Erkens, 2004). Some studies studied graduate students' teaching and research skills (Gilmore & Feldon, 2010). They focused on validity measures by

examining the relations of the variables of the study and designed a survey to capture graduate students teaching and research skills. Meanwhile, students' perceptions of academic competencies were also measured by several studies to provide an in-depth understanding of first-year students' perceptions of their research skills (Imafuku, Saiki, Kawakami, & Suzuki, 2015; Mah & Ifenthaler, 2018).

According to McMillan and Hearn (2008), student self-assessment can benefit and improve students' learning, involvement, and drive in their education. Student assessment does not only imply checking answers on a multiple-choice test, but rather it is "a process by which students (1) monitor and evaluate the quality of their thinking and behavior when learning and (2) identify strategies that improve their understanding and skills" (p. 40). Furthermore, self-assessment is helpful for students because they evaluate their work or knowledge to develop and improve their skills as they recognize weak points between their present and desired performances. McMillan and Hearn (2008) conceptualized a combination of three cyclical components of self-assessment: self-monitoring, self-evaluation, and identification and implementation of instructional correctives. Self-monitoring is the process where the students pay attention to what they are doing or what they know about research which concerns the awareness and thinking of the students in research as they go along with their curriculum. The second component, self-evaluation, is when the students identify their progress towards their desired performance. Lastly, students implement instructional correctives to improve their performance. "Because students at this stage need skills in determining learning targets and further instruction that will enhance their learning, they should be aware of options for further goals and instruction." (p. 42).

Nonetheless, these tools are also subject to biases and limitations that may influence the validity and reliability of the responses (Demetriou, Ozer, & Essau, 2015; Salters-Pedneault, 2020). One of the main disadvantages of these tools might be the *social responsibility bias* or social desirability bias (Lavrakas, 2008). This refers to the tendency that the respondents do not respond truthfully to the questions, especially on sensitive questions, and answer in a socially acceptable way. This results in inaccurate self-reports and erroneous study conclusions of overreporting socially desirable behaviors and underreporting those undesirable ones (Latkin, Edwards, Daey-Rothwell, & Tobin, 2017; Lavrakas, 2008). Moreover, the respondents might also exhibit *response bias* where they respond in a certain way regardless of the question. Demetriou et al. (2015) illustrated that individuals might be more likely to answer "yes" or more likely to respond "no."

Another problem in utilizing self-assessment tools is clarity. The questions or statements may have different meanings among different individuals. Thus, to avoid bias, all items in the questionnaire must be clear and easy to understand. They can also contain both close- and open-ended questions. Open-ended questions invite the respondents to answer in their words, and they get to express their thoughts that the closed-ended ones did not grasp. Fixed-choice questions can also be used, usually asking the participants between a "yes" and a "no" or through a rating scale. However, asking the participants to rate a statement gives them limited ability to express themselves and their feelings. To address this limitation, Demetriou et al. (2015) suggest using a response scale that is most appropriate to the set of questions, the most common of which is the Likert scale. Explicitly defining the rating options increases the reliability of how respondents use the scale.

Several studies have investigated factors that may influence change in the research skills of students. Finch et al. (2013) have identified that the level of research interest was reportedly higher than confidence and experience. It was also noted that many respondents had limited research experience, which affected their research performances. Besides, critical thinking skill is one of the core competencies a research student must possess. The study of Terenzini et al. (1995) asserted that in-school and out-school experiences played significant positive roles in developing critical thinking skills. Improvement in research skills was found to be accounted for in the academic performance of students. The study of Singh et al. (2016) revealed a positive and statistically significant impact of learning facilities, communication skills, and proper guidance from parents on student academic performance.

To facilitate learning among students in Methods of Research, the teacher should be flexible and creative. He is expected to modify his teaching plans while introducing new techniques. In research methods, the teacher's ultimate goal is to assist the students in appreciating the different steps of the research process. Leone and Maurer-Starks (2007) presented that teaching research methods starts by giving the students a solid foundation of research. Through this, the students will be prepared for the subsequent phases of their classes and stimulate their ideas and understanding of research.

Teaching Methods of Research is similar to teaching other courses. It might be something different in terms of learning it because it requires a set of specific skills. Vidergor and Sela (2017) presented innovative strategies for higher educational institutions in various fields that address using technology, cooperative teaching-learning strategies, and value-based methods. Methods of Research teachers can incorporate technology in educating students in research by applying different software used in data analysis. Instead of doing a manual process in computing or analyzing the data, Methods

of Research teachers can demonstrate the use of various applications used in research. This is also a way for teachers and students to adapt to innovations. However, this requires specific expertise and training of the teacher. Moreover, computers and purchasing of software are also needed. This strategy might be expensive, yet learning can be engaging, especially for this digital generation. Cooperative teaching-learning strategies can enhance the skills of students in problem-solving. This strategy refers to problem-based learning, project-based learning, and personal network problem. Methods of Research course can be a two-way process where teachers can give problems to the students and let the students figure out how to solve these problems with supervision and direction. This requires interaction and active participation between teachers and students. In teaching Methods of Research, the teacher must also promote social responsibility and value and knowledge to education which pertains to the value-based methods. Researchers need to socialize and build rapport with others in some cases. It is significant to promote a value-based method in teaching Methods of Research for the students tend to forget that they have social responsibilities and ethics to consider. Students, in this way, can appreciate the value of what they are doing and will learn to protect the welfare of others.

METHODOLOGY

This study utilized explanatory sequential mixed methods research design. Creswell (2014) defined explanatory sequential mixed methods research design as one where “the researcher first conducts the quantitative research, analyzes the results, and then builds on the results to explain them in more detail with qualitative research” (p. 15). It is considered explanatory because the qualitative part is used to explain the quantitative part, whereas it is sequential since the design follows a sequence of quantitative results first then the qualitative results. The researchers adapted the four-phase basic procedure of implementing explanatory research design according to Creswell and Plano Clark (2018).

The first phase of the study was the quantitative part, where the researchers used survey research. The respondents were selected teacher education students in Dagupan City who were enrolled in Methods of Research in the first semester of AY 2018-2019. The researchers devised a 10-item questionnaire designed to evaluate the skills of the students in the research. The contents of the questionnaire were based on the course objectives of Methods of Research. It contained competencies expected from students at the end of the course. The formulated questionnaire served as the primary tool for the assessment of the research capabilities of the respondents. The survey was administered twice: the first was on the first week of classes as a kickoff (i.e., pretest) and another the

week before the scheduled final exams (i.e., post-test). The respondents self-assessed their ability to perform the specific research skills on a four-point scale: low (0-25%), medium (26-50%), high (51-75%), and expert (76-100%). The last part of the questionnaire was composed of open-ended questions about various factors influencing the students' research skills and teaching strategies that may improve these competencies.

The data gathered from the quantitative part was analyzed through statistical analysis, specifically descriptive statistics and paired t-test. Mann (2016) defined descriptive statistics as the branch of statistics that deals with "methods for organizing, displaying, and describing data using tables, graphs, and summary measures" (p. 3). Specifically, the mean was utilized to describe the assessment of the students' research skills. On the other hand, paired-samples t-test, or dependent t-test, compared the students' research skills before and after the course. Paired samples are two data sets where for each data collected from one sample, there is a corresponding data value collected from the second sample, and both data sets are collected from one source (Mann, 2016). In this case, the pre- and post-tests of the students served as the paired samples. If the p-value is less than the threshold of 0.05, then the mean difference of the two samples (pretest and post-test scores) was statistically significant. Moreover, a negative mean difference (MD) indicates that the second sample (i.e., post-test) obtained higher scores than the first one (i.e., pretest).

The second phase, the qualitative part, was governed by qualitative descriptive research. Qualitative description is used to formulate descriptions about a phenomenon by focusing on who, what, and where of events or experiences (Bradshaw, Atkinson, & Doody, 2017; Sandelowski, 2000). The researchers utilized focus group discussion (FGD) to derive explanations for the quantitative part of the study. Five of those who participated in the survey were purposively selected to join the FGD. They were chosen according to levels of improvement in their research skills, and the variety of responses on the open-ended questions about factors and teaching skills that may influence the change in their research skills were also considered. The researchers formulated a semi-structured interview guide composed of open-ended questions.

Data gathered from this phase were analyzed through qualitative content analysis (QCA). Sandelowski (2000) defined QCA as the "analysis of verbal and visual data-oriented toward summarizing the informational contents of data." The researchers adopted the four-step QCA by Bengtsson (2016) — decontextualization, recontextualization, categorization, and compilation. The researchers decontextualized the data by familiarizing themselves with it and constructing tentative findings. These findings were recontextualized to determine which statements were to include or exclude.

Then, recontextualized findings were grouped into homogeneous categories. Lastly, the findings were compiled using specific words from the data to "stay close to the text" (Bengtsson, 2016, p. 10).

The third phase of the design is integrating results where the qualitative results were used to enrich and contextualize the quantitative findings (Bowen, Rose, & Pilkington, 2017; Creswell, 2014; Creswell & Plano Clark, 2018). Findings from the qualitative part were connected to those in the quantitative part to provide in-depth explanations for each.

The fourth and final phase involved the conclusions derived from the findings of the study. In this phase, the researchers summarized and interpreted the quantitative and qualitative findings collectively.

RESULTS

Table 1 shows the assessment of the research skills of the respondents before and after their Methods of Research course.

Table 1. Research Skills Assessment

Research Skills Assessment

	PRETEST		POSTTEST	
	Mean	*Interpretation*	*Mean*	*Interpretation*
Articulate basic terms and concepts	2.52	High Ability	3.04	High Ability
Explain the phases of the research process	2.52	High Ability	2.87	High Ability
Apply the specific concepts of the research process	2.43	Medium Ability	2.91	High Ability
Select appropriate tools to gather data and statistical treatment for analysis	2.48	Medium Ability	2.87	High Ability
Undertake data gathering procedures independently	2.13	Medium Ability	2.87	High Ability
Create appropriate tables to organize and present data	2.52	High Ability	2.96	High Ability
Critically analyze and interpret data gathered	2.48	Medium Ability	2.83	High Ability
Write appropriate summary, conclusion, and recommendations	2.52	High Ability	2.91	High Ability
Develop the final research output	2.48	Medium Ability	2.87	High Ability
Present the research findings in a podium and/or poster presentation	2.39	Medium Ability	2.96	High Ability
Overall Average	2.48	Medium Ability	2.83	High Ability

Findings reveal that the respondents have generally assessed themselves to have the medium ability in their research skills before taking the Methods of Research course. Further, the respondents expressed high ability in four out of ten skills. The respondents see themselves as having high ability on the following research skills: articulating basic terms, concepts, and guidelines; explaining the phases of the research process; creating appropriate tables to organize and present data; and writing comprehensive summaries, conclusions, and recommendations. However, the respondents have assessed themselves to have medium abilities on the remaining six skills; applying concepts in each research phase, selecting appropriate data gathering and analysis tools, undertaking data gathering procedure independently, analyzing data critically, writing the final report, and presenting the output in fora.

On the other hand, the results showed that the respondents evaluated themselves to develop high abilities in all the research skills mentioned after the course. Specifically, the respondents assessed themselves to have the highest ability to articulate basic terms, concepts, and guidelines. They expressed that research is about finding solutions to problems or discovering something contributing to their fields of interest. The respondents admitted that they were taught to define their research titles and their specific objectives precisely. Some have shared that they can formulate a research title and specific problems independently. The students have learned the proper conduct of each phase of their thesis and the importance of each chapter of their studies. They became more aware of the various research methodologies, not just quantitative and qualitative approaches. They have understood the different methods and their uses. However, they still had the most difficulty in data analysis and interpretation which acquired the lowest mean.

Meanwhile, Table 2 displays the paired t-test between the pretest and post-test assessments of the specific research skills of the respondents.

Table 2. Paired Samples t-test on Research Skills Assessment

Paired Samples Test

	MD	*t*	*p*	*Interpretation*
Articulate basic terms and concepts	0.522	-3.761	.001	Significant
Explain the phases of the research process	0.348	-2.006	.057	Not Significant
Apply the specific concepts of research process	0.478	-3.447	.002	Significant
Select appropriate tools to gather data and statistical treatment for data analysis	0.391	-2.237	.036	Significant
Undertake data gathering procedure independently with minimal supervision	0.739	-5.147	.000	Significant
Create appropriate tables to present data	0.435	-2.865	.009	Significant
Critically analyze and interpret data gathered	0.348	-2.152	.043	Significant

Write appropriate summary, conclusion, recommendations	0.391	-2.859	.009	Significant
Develop the final research output	0.391	-2.398	.025	Significant
Present the research findings in podium and/or poster presentation	0.565	-4.092	.000	Significant
Overall	0.387	-4.030	.001	Significant

The table shows that the respondents had the greatest significant improvement in terms of their skills in undertaking data gathering procedures independently ($p < .001$). This implies that among the ten research skills intended to be acquired by the students at the end of the semester, they showed the greatest improvement in data gathering. That is, they believed they could execute the said procedure with little to no supervision.

The second highly significant improvement was found in the skills of the respondents in an oral podium/poster presentation ($p < .001$). This can be viewed in the students' presentation skills. Statistically significant positive mean differences were also found in the students' skills of articulating basic terms, concepts, and guidelines ($p = .001$) and applying specific concepts in each phase of the research process ($p = .002$).

A statistically significant positive mean difference was also found in selecting appropriate tools to gather data and statistical treatment for data analysis ($p = .036$). Research skill improvements in terms of critically analyzing and interpreting gathered data ($p = .043$) and creating appropriate tables and charts in organizing and presenting data ($p = .009$) were also found to be statistically significant.

Also, writing an appropriate summary, conclusions, and recommendations ($p = .009$) and developing the final research output ($p = .025$) were also found to have statistically significant substantial increases. This implies that the respondents had increased skills after taking the Methods of Research subject. This refers to writing the results and the synthesis of the results and the literature.

However, there was no significant difference found in explaining the phases of the research project before and after the course ($p = .057$). This implies no difference between the students' knowledge regarding the phases of a research project before and after the course. In other words, the research process that the students were aware of before enrolling in the Methods of Research was not different from what they have learned throughout the course.

Overall, a statistically significant difference was found between the pretest and post-test scores ($p = .001$). It can be inferred that there was a significant improvement in the research skills of the teacher education students before and after their research

subject. Moreover, the overall t-test result reveals a positive mean difference between the overall pretest and post-test skills assessments of the respondents; thus, the post-semester skills of the respondents were better than that of the pre-semester. This implies an increase in the overall assessment of the research skills of the respondents. Generally, after one semester, the respondents showed considerable growth in their research skills, which they may apply in their thesis writing the following semester.

Further, Table 3 below presents the factors and teaching strategies that influenced the students' research skills.

Table 3. Factors and Teaching Strategies Influencing Research Skills

Factors and Teaching Strategies Influencing Research Skills of Students	
Teaching Strategies and Methods	"By giving the students research works and guiding them so that they will know what to do…."
	"By assessing the capability of students to identify their strengths and weaknesses…."
	"By teaching students to conduct research in line with their interests…."
Student-Related Influencing Factors	"The confidence of the student is the most difficult part of researching. You cannot gather information if you do not build up your confidence, and you cannot present it if you do not have enough confidence."
	"Practice in oral communication to build confidence."
	"Vocabulary and sentence construction"
	"Time management"

Findings show that the students were primarily concerned about the "*teaching strategies and methods"* their research instructors utilized in their classes. The students believe that effective teaching and learning depends on the different methods and approaches that a teacher can use according to the students' ability to grasp information and the difficulty of the topic. One example they have mentioned is that the teachers must provide activities and class works to help their learning. By *"giving them research works and guiding them so that they will know what they are doing,"* students will be able to apply their knowledge and skills in research.

The students also expressed that a Methods of Research instructor should *"assess the capability of students to identify their strengths and weaknesses."* As future teachers, they acknowledge the importance of identifying the strengths and weaknesses of their students. Through this, they can quickly adapt to the individual needs of their students.

The respondents also shared that *"teaching students to conduct research in line with their interest"* will increase their motivation and skills in research writing. Topics of the thesis they like would increase their interest in doing it.

Participants have shown how their self-confidence in their research skills mattered to them. They said, "*The confidence of the student is the most difficult part of researching. You cannot gather information if you do not build up your confidence and you cannot present it if you do not have enough confidence."* Moreover, since oral dissemination of research findings was considered one of the most challenging parts of research, some emphasized that teachers should *"practice the students in oral communication to build their confidence."*

Moreover, the respondents were uncertain of their research-related skills like "*vocabulary and sentence construction"* and were afraid this might influence their research writing. Since the thesis is primarily written in English, they uttered the need to be fluent in the said language to communicate their thoughts effectively, be it written or oral.

Lastly, *time management* was one of the concerns of the students. They were enrolled in other major subjects in the same semester as their Methods of Research and Thesis Writing subjects. Thus, their schedules were divided into various subjects and the writing of their theses. In that sense, college students may procrastinate until they experience the pressure of beating several deadlines for their different academic requirements.

DISCUSSION

Before the Methods of Research subject of the respondents, they have shown medium ability on the various research skills they are expected to learn after the course. They had the highest ability in articulating basic concepts, explaining research phases, creating appropriate data presentations, and writing comprehensive summaries, conclusions, and recommendations.

During the FGD, the participants said that the survey is the only possible data-gathering tool they can use in their theses. One thought that, before enrolling in the Methods of Research subject, "research is a survey." This notion was evident since most of the class utilized surveys or questionnaires as the primary data-gathering tool. Meanwhile, it must be noted that the respondents obtained the lowest assessment on undertaking data gathering procedures independently. The participants have shared their difficulties in conducting a survey. Few have mentioned that conducting a survey is tiring and time-consuming despite knowing that it only encompasses a few respondents from a population. However, they have acknowledged that one of the advantages of

conducting survey research is “to develop and gather more effective information” and that this must be performed accurately to yield accurate results as well.

After the entire semester of research methods, the respondents' abilities have shown high ability on the different research skills. This is consistent with the skills developed through research, according to Steward et al. (cited from Andersen, 2015). Primarily, one can understand research processes and their applications. Through research engagement, students will understand each phase of research and learn how to carry out these phases in their respective fields. Also, the researcher can develop critical thinking skills, teamwork skills, and communication skills, which are all necessary for completing research work.

The teacher education students showed statistically significant changes in their research skills. Some of these are executing data gathering procedures, creating appropriate data presentations, and analyzing critically. Data gathering is crucial for developing a research study because it will provide the data needed to address the research problems. Regardless of the field of study or preference in data analysis, accurate data gathering procedures must be employed to ensure the reliability of the research. Improperly conducted data collection may result in fabricated data and research findings, thus the inability to answer the research objectives accurately. This result is supported by the studies of Tan (2007) and Alghamdi and Deraney (2018) that students tend to consider data analysis and data presentation as the most challenging stages of the research project. The difficulty in these parts of research is because the data analysis and interpretation, along with appropriate data presentation, is the very heart of the research. This is the stage of the research process which yields fruits from mere objectives and hypotheses (Oliver, 2010). Aside from displaying the study's results, data analysis and interpretation can compare the findings to other similar studies, draw general themes and inferences, and provide implications to a broader context. Despite the challenging experiences, the students could generally demonstrate improved skills in research.

The students also exhibited improvements in articulating basic concepts and guidelines of research and applying these in writing. Ball and Pelco (2006) believed that learning to do research is better facilitated by training critical research problem-solving and reasoning skills than by having them memorize research terms and definitions. Moreover, Boyer Commission (cited from Garg, Madhulika, & Passey, 2018) emphasized the need to imbibe students' written and communication skills. Whether oral or written, communication skills could be developed through presentations and group discussions.

On the other hand, the teacher education students perceived that the teaching strategies and methods significantly improve their research skills. As future teachers, they primarily perceived that they would apply their knowledge and skills by providing students various guided and independent research-related class works aptly to their strengths and weaknesses and learning styles. When the teachers have teaching strategies appropriate to the students' learning styles, the students' competencies will be developed. Requiring class-based research projects among students is highly suggested as one way of developing their research skills (Ball & Pelco, 2006; Moore & Teter, 2014). When students are hands-on in learning and writing research, they become more engaged in it. Thus, this increases their interest in their research.

Also, interest plays a vital role in writing research. Teaching students to research in line with their interests will increase their motivation and skills in research writing. There have been numerous studies worldwide asserting that interest plays a significant role in the motivation, achievement, productivity, and perseverance of students in their academic requirements (Kpolovie, Joe, & Okoto, 2014; Logasov, n.d.; Showman, Anh Cat, Coo, Holloway, & Wittman, 2013; Weber, 2003). One way of increasing the students' motivation is by allowing them to have some degree of choice of topics in their research papers that connect to their outside interests and passions. Students interested in learning are motivated to pursue learning experiences on tasks despite the increasing difficulty. This leads to their willingness to persevere in the learning tasks they are interested in. Literature shows that self-confidence was also found to be one of the various factors that may affect the research capabilities of the respondents (Verma & Kumari, 2016; Finch et al., 2013; Tan, 2007; Druckman & Bjork, 1994; Garg, Madhulika, & Passey, 2018). Thomas (cited from Garg, Madhulika, & Passey, 2018) wrote that various skills demand a researcher to be self-critical and aware of his strengths and weaknesses. Druckman and Bjork (1994) emphasized that the terms "self-confidence" and "self-efficacy" interchangeably are used to describe one person's perceived capability to accomplish his tasks. Verma and Kumari (2016) found a significant relationship between students' academic achievements with high and low confidence. The study of Finch et al. (2013) has identified that students tend to be more confident and experienced with basic research tasks (like finding literature and formulating introduction) and less confident and experienced with more complex research tasks (like data analysis and interpretation). Inexperienced undergraduate student researchers tend to feel inadequate about their knowledge and skills in research and are anxious about their ability to fulfill the course requirements.

Lastly, poor time management has been linked to poor academic performance and research productivity among undergraduate students (Adebayo, 2015; Nadinloyi et al., 2013; Nasrullah & Khan, 2015; Chase et al., 2013). As the students devote their time to some of their "deliverables" (Topp in Chase et al., 2013), they tend to lack time for some other activities they needed to do. Moreover, as they consume their time in other activities, they have less time to write their research. Hence, they will not gather enough information to rationalize their hypotheses or support their findings.

CONCLUSIONS

Findings showed that the respondents have a medium ability in their research skills during the pretest. Four out of ten skills resulted in a high ability to articulate basic terms, concepts, and guidelines, explain the phases of the research process, create appropriate tables in presenting data, and write appropriate comprehensive summaries, conclusions, and recommendations. The respondents need direction in the area of independently conducting data gathering procedures.

The respondents expressed an improvement in the post-test, garnering a high-ability interpretation of the results. The findings showed high ability in all the ten areas of research skills assessment. Articulating basic terms, concepts, and guidelines showed the highest average weighted mean, while critically analyzing tables to interpret and present the data gained the lowest. The relationship between the research skills assessment of the students before and after they took Methods of Research showed improvement. Factors that highly influenced the participants' changes in the research skills were teaching strategies apt to the students' learning styles, strengths, and weaknesses, interest and self-confidence, and time management.

RECOMMENDATIONS

Based on the findings and conclusion of the study, the following are recommended:

1. The researchers recommend conducting a further study to triangulate the students' research skills based on their self-assessment with their actual academic performances in the Methods of Research course to validate results.
2. The researchers recommend that the university conduct this study on other departments and colleges to gain other factors influencing students' research skills and improve Methods of Research courses in their colleges.
3. The researchers also recommend the Teacher Education department utilize innovative teaching strategies for their respective Methods of Research instructors to improve the students' learning on research.

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