

## Constructivism as a Paradigm in Teaching Research with Statistics: A Perception Study

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### Abstract

This "Constructivism as a Model in Teaching Research with Statistics" study aims to provide a model for the teaching of research writing and provide a better foundation in data analysis. . This research is based on constructivist learning theory – learning, constructing and translating one's own knowledge. A single-group semi-experimental design was used in this study; analysis of the research papers of 120 students assigned to written research and progress-based research statistics is provided in the module. Comparing research writing skills from the pre-test and post-test, students showed significant improvement from mostly “very poor” to “poor” to mostly “good” or medium. average after the test. The gain is significant at 0.01 when using Wilcoxon's signed rank test. Furthermore, the paper of the study is divided into three parts, Introduction, Related Materials and Methodology. Areas where students need a lot of help are writing research instrument validity, research instrument reliability, and data analysis.

**Keywords:** Constructivism, Paradigm, Research, Statistics.

### 1. Introduction

For Van Doren, (n.d.) "the art of teaching is the art of supporting discovery" and for Albert Einstein (Lim, 2012) "I never teach my students, I just try to provide things. conditions so that they can learn".

Although there are as many different views on education as there are philosophers; have this state of continuous acquisition and transmission of knowledge to maximize learners' latent skills. The concept of education has changed significantly (Moore, 2015); teaching methods have been studied (Bidabadi, Isfahani, Rouhollahi, & Khalili, 2016); and theories have been developed (Duchesne, Sue & McMaugh, 2016) to understand the nature of a child. However, educational problems are cyclical. In the Philippines, there is an age-old problem undermining the education system - degraded quality of education leading to low research and development productivity (Report of the Education Commission 1991 and the Education Commission of the Philippines). higher education, 2017). The task of teachers is to understand the unique characteristics of learners (Kochhar, 1985), the key to guiding them to develop every aspect of who they are. Similar to Van Doren and Einstein's additional views; teachers should create a learning environment that enhances learning outcomes in line with the constructivist concept – learning, constructing and translating one's own knowledge (He, 2005; Qi, 2011; Zhang, 2012; Duchesne and McMaugh, 2016; and Moore, 2015).

The researcher believes that the learners themselves can create and recreate themselves. Teachers only provide learning opportunities for learners to construct their own knowledge. The extent to which knowledge is acquired depends on one's abilities and goals, underpinned by the quality of the learning experience.

Overall, this study aims to illustrate statistical ways of teaching research writing applying constructivist learning theory. The investigation looks at cognitive processes, how learners construct their understanding by combining a priori and posterior knowledge. Newly constructed knowledge and understanding is measured against the learner's progress consistent with writing a sound research paper.

### **Statement of the Problem**

This study generally aimed to illustrate ways on how to fill the gaps in teaching and learning research writing and statistics in the tertiary level using the principles of constructivism. The general concept of constructivism is that knowledge is of no transferability and learning varies with the students' abilities (Qi, 2011).

Specifically, this study aimed to form the learning blocks or the fundamental knowledge and proficiencies in writing research proposal with supplemental lessons in statistics and shall answer the following problems as perceived by the respondents:

1. What is the level of research writing capabilities of the students before the intervention in terms of writing the following;
  - a. Introduction (Chapter I),
  - b. Review of Literature (Chapter II), and
  - c. Methodology (Chapter III)?
2. What is the level of research writing capabilities of the students after the intervention in terms of writing the following;
  - a. Introduction (Chapter I),
  - b. Review of Literature (Chapter II), and
  - c. Methodology (Chapter III)?
3. Is there a significant difference in the level of research writing capabilities of the students before and after the intervention in terms of writing the following;
  - a. Introduction (Chapter I),
  - b. Review of Literature (Chapter II), and
  - c. Methodology (Chapter III)?
4. What research development program to be developed to enhance students' research writing capabilities?

### **Hypothesis**

Based on the objectives stated above, the hypothesis below is drawn.

1. There is no significant difference in the level of research writing capabilities of the students before and after the introduced activities in terms of the following:
  - a. Introduction (Chapter I),
  - b. Review of Literature (Chapter II),
  - c. Methodology (Chapter III).

### **Theoretical Framework**

This quasi-experimental study is based on the following theories:

Jérôme Bruner's constructivism; cognitive development theory of Jean Piaget; The Social Cognitive Learning Theory of Julian Rotter and Waler Mischel; Sociocultural theory of education by Lev Semenovich Vygotsky; and the self-determination theory of Edward Deci and Richard Ryan.

Constructivism is a theory of learning rooted in the notion that learners construct knowledge on their own, meaning that learners discover and construct their own knowledge (Moore, 2015, cited by Anderson, Greeno, Reder and Simon, 2000; Fosnot, 2005; Waxman, Padron, & Arnold, 2001). Each person learns individually (and socially) building meaning as they learn. The construction of meaning is itself a learning process. As learners interact with their environment, they connect new information from current experience with previous knowledge

and thereby build new understanding and knowledge. Learning is supported by interaction with other learners and adults (Duchesne & McMaugh, 2016). Learners visualize and associate information in their heads with information they receive from their sensory organs (Moore, 2015). Knowledge construction occurs when thinkers have invaluable resources, support, and direction (Duchesne & McMaugh, 2016, cited in Hogan & Tudge, 1999; O'Donnell, 2012).

Cognitive processes are constantly taking place in the child's mind and in the minds of those around him. Whether a child is paying attention to a conversation, estimating the speed of a car crossing the street, or memorizing information for a school test, they will perceive information, process, remember or think. Cognitive psychology is the study of how people perceive, learn, remember, and reflect on information (Sternberg & Sternberg, 2017).

The sociocognitive learning theories of Julian Rotter and Walter Mischel postulate that cognitive factors help learners respond to their environment. Neither the environment nor the individual is fully responsible for such behavior. Instead, learners cling to their perceptions, past history, and their expectations about the future as key to predicting behavior. Michael's social cognitive theory has much in common with Bandura's social cognitive theory and Rotter's social learning theory. Like Bandura and Rotter, Mischel believes that cognitive factors, such as expectations, subjective perceptions, values, goals, and personal standards, play an important role in shaping personality. His contributions to personality theory have evolved from research on delayed gratification to research on personality consistency or inconsistency, and is currently working with Yuichi Shoda on the development of personality. cognitive-emotional personality system "Feist, Feist, & Roberts, 2018).

Sociocultural theory was developed by Lev Semenovich Vygotsky with the main claim that children are placed in different socio-cultural contexts and that their cognitive development is enhanced through social interaction with others. more qualified individuals (Psychology Notes HQ, 2018). Parents, caregivers, peers, and entire cultures are responsible for the development of higher-order functions. Learning is grounded in interaction with others. When this happens, the information is integrated at the individual level (Cherry, 2019). Learning occurs when societies equip their new members with skills they deem important and relevant. Learners are considered newcomers who undergo training under the supervision of a mentor. Inculturation occurs in communities of practice when mentors impart knowledge to novices in a particular job (Kaur, 2015).

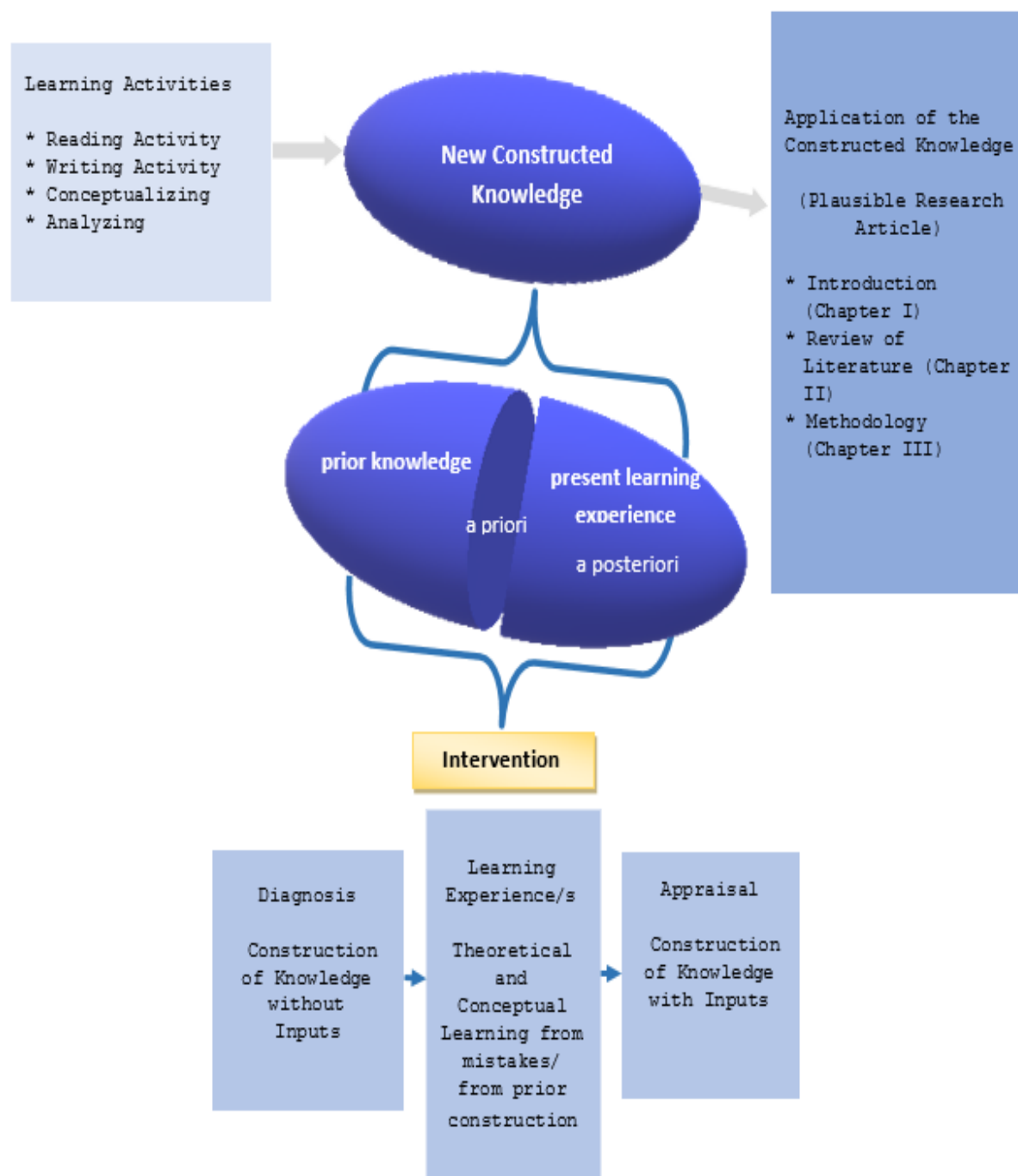
Deci and Ryan believe that in goal-directed behavior and psychological growth, it is important to satisfy all three psychological needs – autonomy, competence, and relationship. If these needs are met, people's motivations will be self-sustaining and their pursuits will align with their sense of self and reflect what they consider interesting or important. Otherwise, their motivation will be more controlled and their activities will be less self-determined (Kaur, 2015).

As applied in this study, constructivism explains that students have developed new knowledge by combining previous and current knowledge through their learning experiences. Specifically, in developing research writing skills, students will combine knowledge gained from past learning experiences, such as high school research writing, and current knowledge. through research writing activities specifically developed to optimize the student learning experience.

With past and present research writing experience, students will be able to build their own meaning and understanding of research writing and ultimately develop or improve their writing skills.

How students combine past and present knowledge depends on cognitive processes, as Piaget explained, cognitive development depends on how a child constructs an intellectual model of understanding. their knowledge of everything (McLeod, 2018). The acquisition of knowledge and the development of writing skills is not dependent on a single factor such as the teacher, but on the product of blended learning experiences in and out of the classroom or their interaction with you. friends, teachers or others can meet their learning needs.

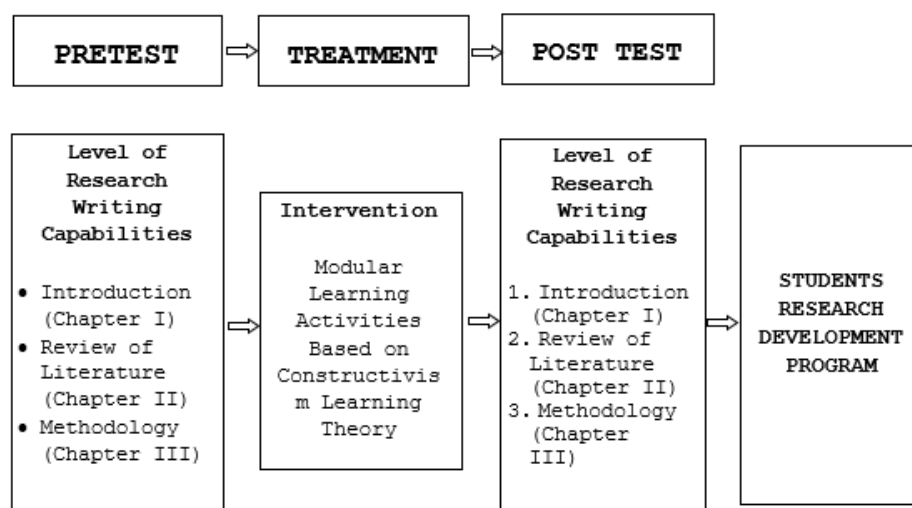
Self-determination is another factor that contributes to how students reach their full academic potential. It is important to meet the psychological needs of students such as; autonomy, competence and belonging. If these needs are met, students will be able to gain autonomy in their knowledge search. Figure 1 on the next page illustrates a constructivist learning framework.



**Figure 1. Constructivism Learning Framework**

### Conceptual Framework

This study posited that students' research writing skills are enhanced by the intervention applied by the teacher. In this study, the researcher conducted a pretest in terms of writing the research proposal involving the Introduction, Review of Literature, and Methodology. After which, the treatment or intervention was conducted. After the module was finished, a post test was conducted to determine if the students improved their research writing capabilities. The findings of the study were then used to base the development of the students' research development program. Figure 2 below illustrates the conceptual framework of the study.



**Figure 2. The Schematic Diagram of the Study**

### Scope and Limitations of the Study

The goal of the study is to provide a tangible or workable framework for how to teach statistical inquiry based on the constructivist learning theory. Constructivist learning theory is rooted in the premise that learners construct their own knowledge. The construction of knowledge is based primarily on the learner's ability to process information, before (stored) and/or present; and the teacher's ability to present or illustrate knowledge to learners; underpinned by a learning environment tailored to the needs of the student. And, how students optimize the knowledge acquired, or how they apply, convey this knowledge according to their abilities and needs.

It is important to establish the background information of the students in terms of technical writing and knowledge in research and statistics. Several writing activities were presented to the students with in-depth or substantial inputs on writing the research proposal and identification of the appropriate test statistics.

On the other hand, the study considered several constraints. The time element of the study was one (1) semestral period. Different groups of students enrolled in Research courses were the subject of the study. The varied socio-demographic characteristics of the students and their learning capabilities set the limit of the study due to the fact that the physical environment and the day-to-day experiences of the learners cannot be controlled. The study considered normal occurrences or circumstances in the lives of the learners. Thus, quasi-experiment was considered as the research design. The researcher-teacher factor was also considered a limitation since the conduct of the investigation was dependent on his teaching capabilities.

## 2. Review of Related Literature

Constructivism has become a relevant learning theory as we enter the 21st century. This theory, derived from the work of Dewey, Piaget and Vygotsky; argues that learners construct their own knowledge independently (Moore, 2015). How do students build their knowledge? In the learning process, students build their knowledge and understanding by experiencing and reflecting on these experiences (Moore, 2015) or by interacting with their environment (Duchesne & McMaugh). , 2016). As learners interact with their environment, they connect new information from current experience with prior knowledge or information that exists within individuals in the process and thus build new understanding. and new knowledge (Ayaz & Şekerci, 2015, and Duchesne & McMaugh, 2016). It is important to note that making sense of a concept or idea is itself a learning process. Constructivism focuses on the process of forming knowledge in the minds of learners and emphasizes how learners take an active role in learning. As Moore (2015) explained, learners build a unique mental picture by combining information in their heads with information they receive from their sensory organs.

As illustrated by Asiksoy and Ozdamli (2017), learning occurs when learners are actively involved in the learning process. Based on learners' experiences, information is constructed in meaningful ways (citing Atasoy & Akdeniz, 2006 and Fosnot & Perry, 2005).

In constructivism, learners are seen as active participants in their individual learning process (Moore, 2015), in which the teacher plays an important role. As there is a change in the view of learning, there is a re-perception of teaching. Teachers should help learners build their understanding of concepts (Moore, 2015). In a press release, Senator Gatchalian said the most important factor in education is the teacher. Schools are only as good or bad as their teachers. Even the brightest students will not reach their full potential without passionate and skilled teachers leading the way. For learners who are struggling to catch up, teachers are their closest and most influential source of life (Gatchalian, 2021).

According to Bada, (2015); teachers must reflect on their teaching practices to guide them on how to apply constructivist ideas in the classroom to help students reach their full potential. In a constructivist approach that allows for a different perspective on education, they also view measurement and evaluation activities differently. In this approach, learners are very active in learning activities. Exams that do not allow reflection, feedback, and assessment of knowledge and skills at a lower cognitive level in the form of multiple choice and short test will be inadequate and inadequate. Thus, in a constructivist approach, instead of product-oriented learning, focus on learning through exposure, project work, portfolio, key diagnostic tree scoring, checklists, performance reviews, self-assessments, alternative assessment tools such as peer review should be used. Here, what is assessed is not a product of learning but a learning process and students continue to learn throughout assessment and evaluation studies (Ayaz & Şekerci, 2015). Contrary to John Locke's popular theory, *tabula rasa*, "at birth, a child's mind is like a blank page" (Androne, 2013); Students should not be viewed as whiteboards to write on or empty containers to be filled, but as active learners (Moore, 2015).

Furthermore, in support of the previous views, Zhang (2011) argues that learning should not be the passive acquisition of knowledge taught by the teacher, but active construction based on knowledge, knowledge and experience of the learners themselves. Student learning should be a process in which learners construct a new cognitive structure through active exploration and communication.

When preparing a research proposal, students writing should be able to articulate ideas and support them with relevant, coherent, and well-organized ideas. Well, it can be done by mastering two important skills:

Read and write. According to Gallagher & Kittle (2018), improving writing is based on the fact, placing words on the page...no shortcuts. Young writers don't just need to practice, they need to practice properly. Bruner believes that students benefit from reviewing a task multiple times, having the opportunity to struggle with increasing complexity with each new task review. They don't learn something as complicated as writing a good story all at once; they learn gradually. They learn as they build new knowledge on top of old knowledge. So, if our students were to learn how to write good stories, they reasoned that they would have to do many rounds in a variety of genres — rounds built on increasingly sophisticated development of skills. McLeod ability (2019).

Also note that when improving skills, teachers should identify the types of texts that students will write in each round and also plan how long it will take students to complete each round. At the beginning of the lesson, teachers should provide students with a roadmap of the tricks they will perform and the skills they will be asked to demonstrate with each assignment. Teachers must relate the critical habit that characterizes all writing with the skills of the particular genre they are studying. There are many skills detailed in the lesson plan, but teachers must believe that students are empowered when they understand that learning to write well... involves mastering a wide range of skills (Gallagher & Kittle), (2018).

Learning happens when it is situated in authentic contexts (Kolb, 2019). Students are exposed in real life situations where they have knowledge and can relate to. To ignite the students critical thinking and writing abilities, they were asked to react in situation/s which touches their very lives like the issues confronting today's generation in the Philippine setting, poverty, politics and the like. Later, they were exposed to topics that has something to do with their future career, as Math, English, Science, and Filipino teachers. Topics like the difficulty in teaching Mathematics, the difficulty of expressing ideas in the English language are among the issues the students were asked to react to. Or, issues confronting the department of Education in general, the schools, the teachers, the learning and the learning environment. Through this, students were gradually elevated or connected to the very object to the course, to teach research with statistics to the teacher-education students.

### **3. Research Design and Methodology**

#### **Research Design**

A single-group semi-experimental study design was used in this study. Survey participants participated in activities to prepare for writing a research proposal. Study participants (students) are placed in normal conditions, so they are observed under normal or routine distance learning conditions using a module developed by the researcher. Observable and unobserved elements of learning are also taken into account in the sense that learning takes many forms and occurs in different ways. In addition, learning acquisition varies from person to person, learning conditions, learning supports, and learning environments. The input to the study is reading and writing activities in which the student is given the opportunity to study the module on their own and use all available means to explore the material. However, the teacher provided support through group discussions and encouraged group activities and peer tutoring. The researcher has provided all possible means to help students learn. This process also involves learning, dropping out, and relearning, where past and present or past and new learning are combined and analyzed to create new knowledge or understanding. The result is a demonstration of knowledge through their writing or research proposal. The data were statistically analyzed to identify significant differences in the students' research writing ability before and after the intervention.

Furthermore, the design of a single-group semi-experimental study is the same as that of an experimental study, but lacks the element of unit control. Although the independent variable was manipulated, participants were not randomly assigned to conditions or order of conditions.

#### **Participants of the Study**

The participants of the study were the students enrolled in Research subjects. One hundred twenty (120) college students enrolled in research were subjected to the one-group quasi-experimentation. Fifty four point five (54.5%) percent of the respondents were enrolled in education and 45.5% were related to business and management.

#### **Research Instrument**

The research instrument used in the study was a researcher-made criteria for evaluating a research proposal which was based from Traenkel, Wallen, & Hyun (2012); Lentz, (2019); Daaboul, (2017); and Organizing Academic Research Papers (2020). The instrument contained items or indicators to evaluate whether or not the write-ups contained the elements in each chapter of the research proposal as illustrated in the module. These were grouped into: Background of the Study, Statement of the Problem, Theoretical Framework, Conceptual Framework, Scope and Limitation of the Study, Review of Related Literature, Research Design, Locale of the Study, Participants of the Study, Validity of Research Instrument, Reliability of Research Instrument, Data Gathering Procedure, and Data Analysis.

#### **Validity of the Research Instrument**

The students were subject to the regular learning conditions in the university they enrolled. Classes conducted in normal class settings. Blended learning modality was applied; using the researcher-made module, the limited class discussion, and group and one-on-one instruction.

After the work plan was approved, the instrument was then subjected to validity and reliability tests. After the validity and reliability were ascertained, the pretest was conducted. Then, the research writing lessons and activities using the module started. One semestral period was allotted for the quasi-experimentation. At the closing of the semester, the post test was done. The data were then submitted to the Statistical Center of Central Philippines State University for analysis.

#### **Data Gathering Procedure**

The students were subject to the regular learning conditions in the university they enrolled. Classes conducted in normal class settings. Blended learning modality was applied; using the researcher-made module, the limited class discussion, and group and one-on-one instruction.

After the work plan was approved, the instrument was then subjected to validity and reliability tests. After the validity and reliability were ascertained, the pretest was conducted. Then, the research writing lessons and activities using the module started. One semestral period was allotted for the quasi-experimentation. At the closing of the semester, the post test was done. The data were then submitted to the Statistical Center of Central Philippines State University for analysis.

### **Data Analysis**

To analyze the data generated by quasi-group testing, the following test statistics are used for each specific problem:

Determine the student's level of research writing ability before intervention in terms of writing (a) Introduction (Chapter I), (b) Literature overview (Chapter II) and (c) Methodology (Chapter III), significance, number of standard frequencies and percentage distributions and deviations were used.

Similarly, to determine the level of research writing ability of students after intervention in terms of writing (a) Introduction (Chapter I), (b) Literature Review (Chapter II) and (c) Methodology (Chapter III), significance, number of reference frequencies and percentage distributions, and deviations are used.

For the third problem, which was to determine the significant difference in students' research writing ability before and after the intervention, Wilcoxon's signed rank test was used.

For issue number four aimed at improving students' research writing ability, the Student Research Development Program was developed.

## **4. Results and Discussion**

### **Level of Research Writing Capabilities in Terms of Writing the Chapter I Introduction**

The student's degree of research writing ability in structuring Chapter I or the Pre-intervention Introduction and post-intervention is discussed below. Five components of Chapter I were assessed: research context, problem setting, theoretical framework, conceptual framework, scope and limitation of the research.

The scores of the students before the intervention were generally poor with an overall average score of 3,3006. The average score in the following components is; 3.7694 (research context), 3,0139 (problem), 3.1833 (theoretical framework), 2.8694 (conceptual framework) and 3.6667 (research scope and limitations). After the intervention, students achieved an overall average score of 5.1887, which is considered good. This means that there was an overall improvement in students' research writing ability from poor (before) to good (after).

The results corroborate Paurillo's (2019) study, on students' lack of motivation to write research, low interpretive ability, and lack of interest in writing. Furthermore, Lasala (2014) stated that the writing ability of Filipino students is relatively lower than the speaking ability. Through using the module as an intervention, students can improve their research writing skills. This may be due to the clarity of the lessons and activities presented in the set. Learners learn at their own pace and at their own pace through self-study modules. Modular learning that meets the needs and abilities of each student (Betlen, 2021). All the learning experiences that learners can have in the classroom will be experienced by the learners in the self-help distance learning module.

The self-help module encourages autonomous or self-directed learning (Betlen, 2021 quoting Malipot, 2020). On the other hand, Hajan, Hajan, and Marasigan, (2019) cited several factors to research writing; (i) teachers' cognition and classroom instructions in teaching writing culture (Suwaed, 2011), (ii) teacher's beliefs in life and their educational beliefs (Al-bakri, 2015), and (iii) beliefs and practices in writing instruction (Yang & Gao, 2013). The data are shown in Table 3 in the following page.

Below is the table based on the discussion above.



**Table 1. The Level of Research Writing Capabilities in terms of writing the Chapter I- Introduction before and after the Intervention.**

Chapter I (Introduction)	Before			After		
	Mean	Interpretation	Standard Deviation	Mean	Interpretation	Standard Deviation
Background of the Study	3.77	Poor	1.12	5.56	Good	2.10
Statement of the Problem	3.01	Poor	0.86	5.62	Good	1.84
Theoretical Framework	3.18	Poor	0.92	5.04	Good	1.93
Conceptual Framework	2.87	Poor	0.89	4.79	Good	1.80
Scope and Limitation of the Study	3.67	Poor	0.94	5.04	Good	1.59
Overall	3.30	Poor	0.70	5.19	Good	1.56

To further analyze the number of students which made improvement in research writing, Table 4 presents the frequency count and percentage distribution on the level of research writing capabilities in writing the introduction before and after the intervention.

It is depicted on the table that before the intervention, only 24 students made good rating, 62 or 51.7% were poor and 32 or 26.7% were very poor. After the intervention, the students marked improvement of which majority are having a good mark. This means that most students show modest competencies in structuring the introduction of their research proposal. This may be attributed to the appropriateness of the language used in the module to the level of understanding and competencies of the students. Moreover, it was ensured that the students were provided with necessary assistance through peer tutoring and group discussion where a more advanced students are paired with average and below average students.

**Table 2. The Frequency and Percentage Distribution of Students Level of Research Writing Capabilities in Writing Chapter I – Introduction before and after the Intervention**

Level	Before		Description	After	
	f	%		f	%
Very Good	0	0.0	The students were able to acquire sufficient knowledge and skills in writing a research proposal. The students need very little assistance or help from the teacher.	9	7.5
Good	24	21.7	Students show modest competencies in writing the content and structuring the research proposal.	79	66.8
Poor	62	51.7	Students show low competency level in writing and structuring a research proposal. Students need a considerable amount of help from the teacher.	17	14.2
Very Poor	32	26.7	Students show very low competency level in writing and exhibit poor knowledge and skill in establishing the content and structure of the research proposal. Students need adequate time and assistance from teacher as learning would start from zero.	15	12.5

Before			Description	After	
Level	f	%		f	%
Total	120	100.0		120	100.0

Scale: Excellent - 5, Very Good - 4, Good (Average) - 3, Poor - 2, Very Poor -1

### Research Writing Capabilities in Terms of Writing Chapter II- Review of Related Literature

Similarly, the students made an academic gain in writing the review of literature before and after the intervention. It is shown in table 5 that the mean rating of the students was 3.38 which is interpreted as *poor* and improved to 4.76 which is interpreted as *good* after the intervention. This implies that they made significant improvement in writing the review of literature with the use of the module. This improvement could be attributed to the daily reading activities where students were required to review research papers and to keep a reading journal to bank research findings that would be useful in writing the review of literature.

The researcher wants to quote the words of Mohammed and Ahmed (2019), who stated that “criticism and writing are the basis of all scholarly research and writing, and they are the most important and cannot be lacking for any scholarly work”. The difficulty in understanding, editing, and writing the document mainly stems from not clearly defining exactly what the reviewers want and how to continue to research it methodically and comprehensively. Therefore, the data are presented in Table 3 below.

**Table 3. The Level of Research Writing Capabilities in terms of writing Chapter II- Review of Related Literature before and after the Intervention.**

Chapter II	Before			After		
	Mean	Interpretation	Standard Deviation	Mean	Interpretation	Standard Deviation
Review of Literature (Overall)	3.38	Poor	1.30	4.76	Good	1.99

Going deeper in the analysis of the data, Table 6 presents the numbers and percentages of students in the different level of research writing capabilities. It is shown that before the intervention, only 19 or 15.8% were rated as *good*, 51 or 42.5% were *poor* while 50 or 41.7% were *very poor*. In contrast, after the intervention, the number of students who progressed in research writing were 21 or 17.5% marked as *very good* and 66 or 55.0% were *good*. Only 7 or 5.8% and 26 or 21.7% remained at *poor* and *very poor* ratings, respectively.

Mohammed and Ahmed (2018) cited important aspects of literature review, quality, accuracy and relevance to the research topic (citing Cresswell, 2012). Furthermore, they explain that the literature review covers what the theories say and their relevance to new research, what, how and to what extent the topic is covered.

Teaching academic writing is a multifaceted skill. Teachers should help students not only write but also develop other skills necessary for writing, such as developing reading habits. Writing has three distinct components, namely the writer's long-term memory, the task environment, and the writing process. Writing is not only cognitive work but also a complex psychological construct that requires careful thought, discipline, and focus (Hajan, Hajan, & Marasigan, 2019).

**Table 4. The Frequency and Percentage Distribution of Students Level of Research Writing Capabilities in Writing Chapter II – Review of Related Literature before and after the Intervention**

Before			Description	After	
Level	f	%		f	%

Very Good	0	0.0	The students were able to acquire sufficient knowledge and skills in writing a research proposal. The students need very little assistance or help from the teacher.	21	17.5
Good	19	15.8	Students show modest competencies in writing the content and structuring the research proposal.	66	55.0
Poor	51	42.5	Students show low competency level in writing and structuring a research proposal. Students need a considerable amount of help from the teacher.	7	5.8
Very Poor	50	41.7	Students show very low competency level in writing and exhibit poor knowledge and skill in establishing the content and structure of the research proposal. Students need adequate time and assistance from teacher as learning would start from zero.	2	21.7
total	120	100.0		120	100.0

Scale: Excellent - 5, Very Good - 4, Good (Average) - 3, Poor - 2, Very Poor -1

### Research Writing Capabilities in terms of writing Chapter III- Research Methodology

At the skill level of writing research writing research methods, the results are presented in Table 5.

Seven components were evaluated in the study method. This includes study design, study site, study participants, validity of research instruments, reliability of research instruments, data collection procedures, and data analysis. It is shown in the table that before the intervention, the overall score of 2.46 was interpreted as very bad. This score improved to 4.41 after the intervention, indicating academic achievement, but this score was interpreted as poor. The areas where the student scored very poorly prior to the intervention were; search aid validity (2.10), search aid reliability (1.81), data collection procedures (2.73) and data analysis (1.70). However, those ratings have improved to 3.77, 3.92, 4.95 and 4.16 respectively.

On the other hand, the research methods sections where students get high marks are writing the study design, study site, study participants, and data collection procedures. , corresponding. This implies that the students were able to make progress in their research writing, especially in research methods writing after using the module.

This improvement may be due to the practicality of the lessons where students relate their prior experiences with the present learning activities. This means further that their prior knowledge was enhanced by the direct application of the presently learned knowledge through the research writing tasks.

**Table 5. The Level of Research Writing Capabilities in writing Chapter III– Methodology before and after the Intervention.**

Chapter III (Methodology)	Before			After		
	Mean	Interpretation	Standard Deviation	Mean	Interpretation	Standard Deviation
Research Design	3.00	Poor	1.12	4.68	Good	1.58
Locale of the Study	3.12	Poor	0.85	4.70	Good	1.77
Participants of the Study	2.80	Poor	0.96	4.68	Good	1.69
Validity of Research Instrument	2.10	Very Poor	0.91	3.77	Poor	1.90
Reliability of Research Instrument	1.81	Very Poor	0.79	3.92	Poor	1.89

Chapter III (Methodology)		Before			After		
		Mean	Interpretation	Standard Deviation	Mean	Interpretation	Standard Deviation
Data Gathering Procedure		2.73	Very Poor	0.90	4.95	Good	1.78
Data Analysis		1.70	Very Poor	0.51	4.16	Poor	1.78
Overall		2.46	Very Poor	0.64	4.41	Poor	1.63

Taking a closer view of the data, Table 6 presents the frequency and percentage distribution of the different levels of research writing capabilities among the students. Prior to the intervention, there were only 16 or 13.3% who marked good. There were 50 or 41.7% who were assessed to be poor and 54 or 43.0% were very poor. After the intervention, the numbers had improved. There were 81 or 87.5% who marked good while 3 or 2.5% marked very good and 2 or 1.7% marked excellent. Only 17 or 14.2% remained at poor ratings and another 17 or 14.2% at very poor rating.

Table below shows the data on the discussion above.

**Table 6. The Frequency and Percentage Distribution of Students Level of Research Writing Competencies in Writing Chapter III – Methodology before and after the Intervention**

Level	Before		Description	After	
	f	%		f	%
Excellent	0	0.0	The student exhibit superior knowledge and skills in writing the content and structure of the research proposal.	2	1.7
Very Good	0	0.0	The students were able to acquire sufficient knowledge and skills in writing a research proposal. The students need very little assistance or help from the teacher.	3	2.5
Good	16	13.3	Students show modest competencies in writing the content and structuring the research proposal.	81	87.5
Poor	50	41.7	Students show low competency level in writing and structuring a research proposal. Students need a considerable amount of help from the teacher.	17	14.2
Very Poor	54	43.0	Students show very low competency level in writing and exhibit poor knowledge and skill in establishing the content and structure of the research proposal. Students need adequate time and assistance from teacher as learning would start from zero.	17	14.2
Total	120	100.0		120	100.0

Scale: Excellent - 5, Very Good - 4, Good (Average) - 3, Poor - 2, Very Poor -1

#### **Test of Significant Difference on Research Writing Capabilities Before and After the Intervention.**

Discussed below is the statistical analysis on the significant difference on research writing capabilities of students before and after the intervention.

The areas of analysis are introductory writing (Chapter I), literature review (Chapter II) and methodology (Chapter III).

Wilcoxon's signed rating test resulted in -8.294a with a corresponding p-value of 0.000, meaning there was a significant difference in the students' ability to structure the content of the introduction.

Similarly, a similar expression was observed in the structure of the literature review and methodology with statistical test and p-values of -7.840a, 0.000 and -8.636a, 0.000, respectively. . These numbers mean that students made statistically significant progress in writing their research proposal pre-intervention.

This implies that the given module or intervention is effective. In addition to the fact that modular learning is very convenient for most typical Filipino students and is the most preferred learning system for the majority of parents/guardians for their children, the modular course is a successful method of learning compared to the traditional one (Guiamalon, Alon, & Camsa, 2021). In addition, Guiamalon, Alon and Camsa (2021) citing Gonzales (2015) have shown that the modular approach can be a good alternative because it is student-centered and self-paced. , allowing students to progress and explore any learning material on their own. . In addition, the use of this module provides a more flexible learning environment for both the instructor and the learner, as both can use technological innovations to optimize the learning experience. (Guiamalon, Alon, & Camsa, 2021 citing Cheng et Bakar, 2017).

Furthermore, Alamelu (2019) points out that teachers need to maintain students' interest in writing and regularly adjust teaching methods according to students' interests. Each lesson requires thorough preparation, where teachers must apply a variety of techniques, personalize their lesson plans, and use relevant and up-to-date teaching tools to make the lesson Writing becomes more interesting.

This is shown in the table on the next page.

**Table 7. The Test of Significant Difference on Research Writing Capabilities before and after the intervention.**

Variables	Test statistics	Test statistics value	p-value	Decision	Interpretation
Chapter I- Introduction	Wilcoxon Signed Ranks Test	-8.30 <sup>a</sup>	0.00	Reject Ho	There is significant difference at 0.01 level
Chapter II- Review of Literature	Wilcoxon Signed Ranks Test	-7.84 <sup>a</sup>	0.00	Reject Ho	There is significant difference at 0.01 level
Chapter III- Methodology	Wilcoxon Signed Ranks Test	-8.64 <sup>a</sup>	0.00	Reject Ho	There is significant difference at 0.01 level

## 5. The Theory Developed Learning Matching and Equilibrium (Balancing) Theory

“Matching and balancing of innate abilities, learning support and learning experiences”

To optimize the potential or latent abilities of the learners, learning experience and learning support should equate with the readiness and abilities of the learners to acquire knowledge and develop competencies.

When learners are ready to advance to new level of abilities, they, at some point, had learned or acquired a certain level of skills through their past experiences. The level of acquisition of knowledge and skills are dependent on the innate abilities to learn and the quality of support and learning experiences. The understanding of the level of abilities and/or competencies of learning would guide the teachers in constructing learning activities that would match to the present competencies and balance the learning needs of the learners towards acquiring a new or higher-level competencies.

For example, for learners to develop or improve their writing abilities, the present level of writing capabilities should be enhanced if the writing experiences and support should be matched and balanced with the level of readiness of the learners to advance towards higher level writing capabilities- from novice to becoming an intermediate, advanced, superior, to distinguished writers.

## **6. Summary, Conclusion and Recommendations**

### **Summary of Findings**

Based on the main goal of the study on teaching and learning research writing and statistics in the tertiary level using the principles of constructivism, the following are the summary of its major findings.

1. The research writing capabilities of the students prior to the intervention were at poor to very poor levels in writing the Introduction (Chapter I), poor in writing the Review of Literature (Chapter II), and very poor in writing the Methodology (Chapter III).
2. Using the module as intervention, the research writing capabilities improved to good in writing the Introduction, good in writing the Review of Literature, and poor in writing the Methodology.
3. In writing the Introduction, the part of which the students recorded the lowest competency in writing the conceptual framework and with highest competency in writing the statement of the problem however, both are rated as good.
4. In writing the Review of Literature, the students marked poor to good before and after the intervention.
5. In writing the Methodology, the area with the lowest rating before the intervention was writing the reliability of research instrument with the rating of very poor. The highest rate was writing the locale of the study which was rated as good. After the intervention, writing the data gathering procedure marked the highest from very poor to good.
6. There was a significant academic gain among the students in research writing capabilities in writing the Introduction, Review of Literature, and Methodology after the intervention.
7. In students research development program, the areas that need to be given much greater emphasis would be on writing the Methodology particularly writing the validity of research instrument, reliability of research instrument, and data analysis.

### **Conclusion**

Based on the study results showing a significant improvement in research writing ability among college students, the researcher concluded that:

The students' research writing ability was generally improved from before to after the intervention or using the module with a good overall academic rating. Progression went from bad to good in Introduction writing, from poor to good in Literary Review writing and from very poor to very bad in Methodology writing.

The area that should be emphasized in the introduction is drafting the conceptual framework.

Areas that need more attention when writing methodology are writing research instrument validity, writing research instrument reliability, and writing data analysis.

Improvements in introductory writing, literature review, and methodology were statistically significant. The areas that teachers-researchers need a lot of attention are methodological writing, especially writing about research instrument validity, research instrument reliability, and data analysis.

Overall, the use of this module as an intervention in written research is effective.

### **Recommendations**

From the results and conclusions of the study, the researcher recommends the following:

8. In teaching research writing, the students should be exposed to reading, reviewing, and analyzing several research articles as bases in structuring their own research proposals.
9. The students should be exposed to or experience drafting and rewriting their written articles as exercises in refining the content of the research proposals.

10. In writing the Introduction, teacher must give more attention to structuring the conceptual framework of the study.
11. To help students write the Review of Literature, they must be taught how to source articles relevant to their study. They should keep reading journals to write or bank the important findings that are needed in writing the review of literature.
12. In writing the Methodology, the research teacher should give greater attention in writing the validity of research instrument, reliability of research instrument, and data analysis.
13. With the academic gain in research writing capabilities of the students using the module, the researcher recommends its use as primary or supplementary reference in teaching research writing.
14. The use of module is further recommended to beginners or novice researchers who wanted to have an independent study of research writing and/or for those who wanted to improve their research writing capabilities.
15. Lastly, it is recommended to schools, colleges, and universities to consider the use of the students' research development program and focus on the areas that need to be given much greater emphasis in research writing such as writing the validity of research instrument, reliability of research instrument, and data analysis.

## References

1. **Duchesne, Sue & McMaugh, Anne (2016).** Educational Psychology for Learning and Teaching, 5<sup>th</sup> Edition. Cengage Learning, 1010 Printing International Limited. China
2. **Feist, J., Feist, G. J., & Roberts, T. A. (2018).** Theories of Personality, 9<sup>th</sup> Edition. McGraw-Hill Education. United States
3. **Kaur, G. (2015).** Motivating Students to Learn. Random Publications, India
4. **Moore, K. D. (2015).** Effective Instructional Strategies from Theory to Practice, Fourth Edition. Sage Publications, Inc., USA
5. **Sternberg, R. J. & Sternberg, K. (2017).** Cognitive Psychology, 7<sup>th</sup> Edition. Cengage Learning Asia Pte. Ltd., Philippines
6. **Traenkel, Wallen, & Hyun (2012).** How to Design & Evaluate Research in Education, Eight Edition. McGrawHill Education, Philippines
7. **Alamelu (2019).** Factors Influencing the Acquisition of Writing Skills. Retrieved December 1, 2021 from <https://www.ijitee.org/wpcontent/uploads/papers/v8i7c2/G10590587C219.pdf>
8. **Androne, M. (2013).** Notes on John Locke's views on education. Retrieved July 24, 2019 from <https://pdf.sciencedirectassets.com>
9. **Anzaldo (2021).** Modular Distance Learning in the New Normal Education Amidst Covid-19. Retrieved December 1, 2021 from [https://www.researchgate.net/publication/351547626\\_Modular\\_Distance\\_Learning\\_in\\_the\\_New\\_Normal\\_Education\\_Amidst\\_Covid-19](https://www.researchgate.net/publication/351547626_Modular_Distance_Learning_in_the_New_Normal_Education_Amidst_Covid-19)
10. **Asiksoy, G. & Ozdamli, F. (2017).** An overview to research on education technology based on constructivist learning approach. Retrieved July 17, 2019 from [https://www.academia.edu/34850350/An\\_overview\\_to\\_research\\_on\\_education\\_technology\\_based\\_on\\_constructivist\\_learning\\_approach](https://www.academia.edu/34850350/An_overview_to_research_on_education_technology_based_on_constructivist_learning_approach)
11. **Ayaz, M. F. & Şekerci, H. (2015, Oct.).** The Effects of the Constructivist Learning Approach on Student's Academic Achievement: A Meta-Analysis Study. Retrieved July 17, 2019 from <http://tojet.net/articles/v14i4/14414.pdf>
12. **Bada, S.O. (2015).** Constructivism Learning Theory: A Paradigm for Teaching and Learning. Retrieved June 24, 2019 from <https://pdfs.semanticscholar.org/1c75/083a05630a663371136310a30060a2afe4b1.pdf>
13. **Bidabadi, Isfahani, Rouhollahi, & Khalili (2016).** Effective Teaching Methods in Higher Education: Requirements and Barriers. Retrieved October 1, 2021 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5065908/>
14. **Cambourne, Brian & Turbill, (2007, Jan).** Looking Back to Look Forward: Understanding the Present By Revisiting The Past: An Australian Perspective, International Journal of Progressive Education, Volume 3 Number 2, 2007. Retrieved August 29, 2019 from <https://files.eric.ed.gov/fulltext/ED498462.pdf>
15. **Cambridge Dictionary (n.d.).** Retrieved December 12, 2020 from <https://dictionary.cambridge.org/dictionary/>
16. **Candrasekaran, S. (2015, July).** Productive Methods of Teaching Middle School Science. Retrieved September 26, 2019 from [http://www.ijhssi.org/papers/v3\(7\)/Version-2/C0372015025.pdf](http://www.ijhssi.org/papers/v3(7)/Version-2/C0372015025.pdf)
17. **Cherry, Kendra (2019, June).** What is Sociocultural Theory? Retrieved June 27, 2019 from <https://www.verywellmind.com/what-is-sociocultural-theory-2795088>

18. **Cognitive Development Theory (Jean Piaget) (n.d.).** Retrieved June 27, 2019 from <http://ddekun.edu.in/Files/2cfa4584-5afe-43ce-aa4b-ad936cc9d3be/Custom/Major%20Aspects%20of%20CD.pdf>
19. **Commission on Higher Education. (2017, November).** The State of Philippine Higher Education. Pasay City, Philippines: Author: Patricia B. Licuanan. Retrieved June 3, 2019 from <https://peac.org.ph>
20. **Count me in! Collecting human rights based data (n.d.).** Retrieved September 26, 2019 from <http://www.ohrc.on.ca/en/count-me-collecting-human-rights-based-data/6-what-involved-collecting-data-%E2%80%93-six-steps-success> (© Queen's Printer for Ontario)
21. **Culatta, Richard (2019).** Constructivist Theory (Jerome Bruner). Retrieved June 24, 2019 from <https://www.instructionaldesign.org/theories/constructivist/>
22. **Daaboul, A. (2017).** State the Study Delimitations and Limitations. Retrieved October 3, 2020 from <https://researchpaperadvisor.com/lets-get-started/state-the-study-delimitations-and-limitations/>
23. **Education Commission Report of 1991.** Retrieved June 3, 2019 from <https://wordpresscom59389.files.wordpress.com/2016/03/curriculumdevelopment-report.pdf>
24. **Gatchalian, Sherwin (2021, May 17, Press Release).** Sponsorship Speech, Senate Bill No. 2152. Retrieved August 15, 2021 from [http://legacy.senate.gov.ph/press\\_release/2021/0517\\_gatchalian2.asp](http://legacy.senate.gov.ph/press_release/2021/0517_gatchalian2.asp)
25. **Glaze, A. L. (2018).** Teaching and Learning Science in the 21<sup>st</sup> Century: Challenging Critical Assumptions in Post-Secondary Science. Retrieved September 26, 2019 from <https://www.mdpi.com>
26. **Guiamalon, Alon, & Camsa (2021).** Teachers Issues and Concerns on the Use of Modular Learning Modality. Retrieved December 1, 2021 from [www.researchgate.net](http://www.researchgate.net)
27. **Hajan, B., Hajan, B. C., and Marasigan, A. C. (2019, March).** Second Language Academic Writing: A Study of Teachers' Beliefs and Pedagogical Practices in Senior High School. Retrieved August 1, 2021 from [https://www.researchgate.net/publication/332143597\\_Second\\_Language\\_Academic\\_Writing\\_A\\_Study\\_of\\_Teachers%27\\_Beliefs\\_and\\_Pedagogical\\_Practices\\_in\\_Senior\\_High\\_School](https://www.researchgate.net/publication/332143597_Second_Language_Academic_Writing_A_Study_of_Teachers%27_Beliefs_and_Pedagogical_Practices_in_Senior_High_School)
28. **Retrieved August 1, 2021** from [https://www.researchgate.net/publication/332143597\\_Second\\_Language\\_Academic\\_Writing\\_A\\_Study\\_of\\_Teachers%27\\_Beliefs\\_and\\_Pedagogical\\_Practices\\_in\\_Senior\\_High\\_School](https://www.researchgate.net/publication/332143597_Second_Language_Academic_Writing_A_Study_of_Teachers%27_Beliefs_and_Pedagogical_Practices_in_Senior_High_School)
29. **International Training Center (2003).** Retrieved December 12, 2020 from (<https://www.itcilo.org/process-constructing-knowledge>).
30. **Lasala, C. B. (2014).** Communicative Competence of Secondary Senior Students: Language Instructional Pocket. Retrieved August 1, 2021 from [https://www.researchgate.net/publication/263281846\\_Communicative\\_Competence\\_of\\_Secondary\\_Senior\\_Students\\_Language\\_Instructional\\_Pocket](https://www.researchgate.net/publication/263281846_Communicative_Competence_of_Secondary_Senior_Students_Language_Instructional_Pocket)
31. **Lentz, C. (2019, July 2).** Academic and Business Writing Tips-Tips for Post Graduate Writing: Scope and Limitations of your Study. Retrieved October 3, 2020 from <http://www.dissertationpublishing.com/dissertation-writing-tips/tips-post-graduate-writing-scope-limitations-study/>
32. **Lim, Glenn (2012).** Leadership, Personal Development, Entrepreneurship. Retrieved June 3, 2019 from <https://glennlimthots.wordpress.com/2012/12/12/einstein-i-never-teach-my-pupils/>
33. **Mark Van Doren (n.d.).** Inductive Teaching: The Art of Teaching is the Art of Assisting Discovery. Retrieved June 3, 2019 from [http://pedagogy21.pbworks.com/f/IPM\\_finalcomments.pdf](http://pedagogy21.pbworks.com/f/IPM_finalcomments.pdf)
34. **Maverick, J.B. (2021).** What Assumptions Are Made When Conducting a T-Test? Retrieved August 12, 2021 from <https://www.investopedia.com/ask/answers/073115/what-assumptions-are-made-when-conducting-ttest.asp>
35. **McLeod, S. A. (2018, June 06).** *Jean Piaget's theory of cognitive development.* Retrieved June 27, 2019 from <https://www.simplypsychology.org/piaget.html>
36. **McLeod (2019).** Bruner - Learning Theory in Education. Retrieved December 2021 from <https://www.simplypsychology.org/bruner.html>
37. **Middleton, F. (2019).** The Four Types of Validity. Retrieved June 18, 2021 from <https://www.scribbr.com/methodology/types-of-validity/>
38. **Mohammed, I.S. & Ahmed, M. (2019).** Problems of Academic Literature Review and Writing the Way Forward. Retrieved August 15, 2021 from <https://www.researchgate.net/publication/331634236>
39. **Organizing Academic Research Papers: 4. The Introduction (2020).** Retrieved October 21, 2020 from <https://library.sacredheart.edu/c.php?g=29803&p=185916>
40. **Pandey, R. (n.d.)** Lecture Notes on Parametric & Non-Parametric Tests for Social Scientists/ Participants of Research Methodology Workshop BBAU, LUCKNOW. Retrieved August 11, 2021 from [https://www.lkouniv.ac.in/site/writereaddata/siteContent/202003241550010566rajeev\\_pandey\\_parametric\\_test.pdf](https://www.lkouniv.ac.in/site/writereaddata/siteContent/202003241550010566rajeev_pandey_parametric_test.pdf)
41. **Paurillo, P. M. (2019).** Research Writing Ability of Senior High School Students as Perceived by Teachers of Sample Schools in Quezon City. Retrieved August 1, 2021 from [https://www.researchgate.net/publication/331411301\\_RESEARCHWRITING\\_ABILITY\\_OF\\_SENIOR\\_HIGH\\_SCHOOL\\_STUDENTS\\_AS\\_PERCEIVEDBY\\_TEACHERS\\_OF\\_SAMPLED\\_SCHOOLS\\_IN\\_QUEZON\\_CITY](https://www.researchgate.net/publication/331411301_RESEARCHWRITING_ABILITY_OF_SENIOR_HIGH_SCHOOL_STUDENTS_AS_PERCEIVEDBY_TEACHERS_OF_SAMPLED_SCHOOLS_IN_QUEZON_CITY)
42. **Price, P. C., Jhangiani, R., & Chiang, I. C. A. (n.d.).** Quasi-Experimental Research. Reliability and Validity of Measurement. Retrieved August 22, 2019 from <https://opentextbc.ca/researchmethods/chapter/quasi-experimental-research/>



43. **Psychology Notes HQ (2018, May).** Vygotsky's Sociocultural Theory of Cognitive Development Retrieved June 27, 2019 from <https://www.psychologynoteshq.com/vygotsky-theory/>
44. **Qi, Wu (2011).** The application of constructivism in senior high school historical teaching under the background of new curriculum reformation--make the opium war as an example. Retrieved June 15, 2018 from <https://search.proquest.com/docview/1874388095/F0C2EE5678FB4E43PQ/7?accountid=173015>
45. **Quasi-Experimental Research**<https://opentextbc.ca/researchmethods/chapter/quasi-experimental-research/>
46. **Ramos, E.T.B. & Gatcho, A.R.G. (2020).** Common Writing Problems and Writing Attitudes among Freshman University Students in Online Learning Environments: An Exploratory Study. *Journal of Translation and Language Studies*, jtls.sabapub.com. Retrieved August 1, 2021 from <https://media.neliti.com/media/publications/328948-common-writing-problems-and-writing-atti-18cf6e27.pdf>
47. **Research Proposal Guidelines (2013, August).** Retrieved September 26, 2019 from <https://www.dlsu.edu.ph/wpcontent/uploads/pdf/urco/guidelines.pdf>
48. **Shuttleworth, M. (n.d.).** Construct Validity. Retrieved August 12, 2021 from <https://explorable.com/construct-validity>
49. **Taherdoost (2016).** Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. Retrieved December 1, 2021 from [https://www.researchgate.net/publication/319998004\\_Val\\_idity\\_and\\_Reliability\\_of\\_the\\_Research\\_Instrument\\_How\\_to\\_Test\\_the\\_Validation\\_of\\_a\\_QuestionnaireSurvey\\_in\\_a\\_Re\\_search](https://www.researchgate.net/publication/319998004_Val_idity_and_Reliability_of_the_Research_Instrument_How_to_Test_the_Validation_of_a_QuestionnaireSurvey_in_a_Re_search)
50. **Theories of Cognitive Development, Psychology of Childhood(n.d.).**
51. Retrieved June 27, 2019 from
52. [http://developmentalcognitivescience.org/lab/H3550\\_files/CgTheories.pdf](http://developmentalcognitivescience.org/lab/H3550_files/CgTheories.pdf)
53. **Vocabulary.com (n.d.).** Retrieved December 12, 2020 from (<https://www.vocabulary.com/dictionary/content>)
54. **Vygotsky's Sociocultural Theory (n.d.).** Retrieved June 27, 2019 from <http://www.ceebl.manchester.ac.uk/events/archive/aligningcollaborativelearning/Vygotsky.pdf>
55. **Wang, Jia, & Jin (2020).** Reading Amount and Reading Strategy as Mediators of the Effects of Intrinsic and Extrinsic Reading Motivation on Reading Achievement. Retrieved December 1, 2021 from <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.586346/full>
56. **What are the guide questions in writing scope and limitation of the study? (2014),** Retrieved October 12, 2020 from <https://brainly.ph/question/93899>
57. **Writing a Literature Review (2019).** Retrieved October 7, 2010 from (Ashford University) <https://writingcenter.ashford.edu/writing-literature-review>
58. **Zhang, Jing (2011).** A Current Research Situation of Geography Teaching Design based on Constructivism Theory in Junior High School. Retrieved June 15, 2018 from <https://search.proquest.com/docview/1874972782/F0C2EE5678FB4E43PQ/4?accountid=173015>
59. **Ferlazzo, L. (2018, April).** Micro-Writing for English Learners. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 48-52
60. **Gallagher, K. & Kittle, P. (2018, April).** Giving Students the Right Kind of Writing Practice. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 14-20
61. **Jurca, L. (2018, April).** Capturing the Flash of Writing, Digital cameras encourage ELLs to tell their stories. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 47-49
62. **Kolb, Liz (2019, February).** SMART Classroom-Tech Integration. *The Tech-Savvy School.. Educational Leadership*. Vol. 76, No. 5. pp. 20-26
63. **Laman, T. T. & Flint, A. S. (2018, April).** Let Them Write Plays. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 44-46
64. **McKenny, Y. (2018, April).** Making Student Writing Matter. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 33-37
65. **Miller, M. (2018, April).** Let Them Write Plays. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 39-42
66. **Schmoker, M. (2018, April).** Demystifying Writing, Transforming Education. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 22- 27
67. **Spycher, P., Austin, K. & Fabian, T. (2018).** The Writing- Centered Classroom. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 54- 59
68. **Wright, Z. F. (2018, April).** Creating a Mindset for Writing. *Learning to Write, Writing to Learn. Educational Leadership*. Vol. 35, No. 7. pp. 74-77.