

Spirally Progressive and Contextualized Research Curriculum Competency Checklists for the Philippine Special Science Program

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Abstract – This pioneering study aimed to develop, validate and propose four (4) 22-page Curriculum Competency Checklists for the research subjects 1 to 4 of the Special Science Program of the Philippines, and measure its level of spiral progression, contextualization, practicality, and acceptability. The proposed Curriculum Competency Checklist were first drafted in 2014 by the researcher and went on with several revisions in 2015 to 2017. They were subjected to validity test by five (5) experts from various universities in the Philippines along the four (4) areas: spiral progression, contextualization, practicality, and acceptability. Findings revealed that the four proposed Curriculum Competency Checklists were found to be very high in spiral progression, very highly contextualized, very highly practical, and very highly acceptable. With this, the researcher recommends that the proposed curriculum competency checklist be adopted by education program supervisors in Science as reference and/or guide in their respective jurisdictions in the teaching of Research subjects in the Special Science Program; and that a periodic evaluation and/or further validation of the proposed curriculum competency checklists may be instituted to further provide strengths on the spiral progression and contextualization of the competencies.

Keywords – Curriculum, Research, Philippines, Special Science Program, Competency

INTRODUCTION

The vision of the Philippine Special Science Program is to produce responsible and morally upright graduates from schools offering relevant and innovative Science and Mathematics Education. Its mission is to create Centers of Excellence in Science, Mathematics, and Research Education in the schools divisions that shall develop the full potential of students along the areas of Science, Mathematics, and Research. The objectives are two-fold: To widen access to quality Secondary Education in Science and Mathematics, and To develop a science culture among the students with the view to prepare them for careers in or for higher learning in Science, Mathematics, and Research.

While the vision, mission, and objectives of this Program were clear and executory, gaps in the implementation were

observed. One of the components of this Science Program is Curriculum Development, and two of the areas of concern on Staff Development is Laying the Ground for Curriculum Reform and Innovation, and Setting the School Context for Curriculum Reform and Innovation. Clearly, during those times of implementation, such a hard curriculum ready for use and distribution to classroom teachers were evidently not available, especially in the subjects Research 1 and 2. In succeeding program monitoring of the Department, there were issues raised on including a research subject for each grade level from Grades 7 to 10. Unfortunately, no syllabi nor curricula and not even a single topic outline were available and transmitted to research teachers. This plan was never materialized and the Science Program was stuck in just 2 research

subjects in Grade 9 (Research 1) and Grade 10 (Research 2) – still without a hard curriculum. Were there a ready-to-use curricula, the implementation of one research subject per grade level could have been implemented, and the level of research may have been significantly increased at this point in time already.

In line with this, the researcher designed and developed four (4) research curricula, and subjected such materials for validation by experts especially along the areas of spiral progression, contextualization, practicality, and acceptability. This study could be a pioneering curriculum checklist development in the country.

OBJECTIVES OF THE STUDY

Generally, this study aimed to develop, validate and propose four (4) Curriculum Competency Checklists for the research subjects 1 to 4 of the Special Science Program of the Philippines, and measure its level of spiral progression, contextualization, practicality, and acceptability.

Specifically, it sought answers to the following questions:

1. Which content in science research and in what sequence are observed in available science and research books to develop a curriculum competency checklist for Special Science Program of DepEd?
2. What is the level of spiral progression, contextualization, practicality, and acceptability of the proposed curriculum competency checklist for Philippine Special Science Program for Research:
 - a. 1,
 - b. 2,
 - c. 3, and
 - d. 4?
3. Based on the findings, what Curriculum Competency Checklist may be recommended for use in the Philippine Special Science Program for the research subjects?

MATERIALS AND METHOD

This study employed descriptive developmental research. Developmental research, as opposed to simple instructional development, has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness. Developmental research is particularly important in the field of instructional technology. The most common types of developmental research involve situations in which the product-development process is analyzed and described, and the final product is evaluated.

In this study, the researcher designed and developed four (4) curricular competency checklists in Research subjects 1, 2, 3 and 4 for the Special Science Program of the Philippines' Department of Education. The researcher was guided by all research, science and statistics textbooks, and internet-based research topic outline existing at the time of development of the four (4) curricula which took a span of three (3) years from School Years 2014 to 2016 with several revisions throughout this period, and went a revision based on the researcher's technical field experience in School Year 2017-2018, especially in the area of practicality.

In the School Year 2017-2018, the curricula was in its final form for validation. The four (4) curricula were sent through e-mail to five (5) experts. These experts are esteemed in their respective universities in terms of research among others, and have publications in refereed journals. The proposed curriculum competency checklists were evaluated using a researcher-prepared checklist-questionnaire in four macro-areas: spiral progression, contextualization, practicality, and acceptability.

One evaluator came from each of the following universities: Pangasinan State University Asingan Campus College of Teacher Education, University of the Philippines Institute of Biology, PHINMA University of Pangasinan College of Arts and Sciences, Mariano Marcos Memorial State University Ilocos Norte College of Teacher Education, and Graduate School.

RESULTS AND DISCUSSION

Science Research Content and Sequence in Research 1

Quarter 1: Science Processes and Attitudes

- Basic Concepts of S & T
- Scientific Principles
- Limitations of Science
- Scientific Attitudes

Quarter 2: Basic Science Processes

- Science Process Defined
- Observing
- Comparing
- Classifying
- Measuring

Quarter 3: Integrated Science Processes

- Inferring
- Predicting
- Controlling variables
- Interpreting data
- Formulating hypothesis
- Experimenting

Quarter 4: Scientific Method

- Steps of a Scientific Method

Science Research Content and Sequence in Research 2

Quarter 1: Descriptive Statistics with Excel Application

- Descriptive vs Inferential Statistics
- Levels of Measurement
- Textual, Tabular, and Graphical Presentation
- Measures of Central Tendency
- Measures of Variability
- Shape of Distribution
- Excel Application in Statistics

Quarter 2: Research and Sampling Designs

- Research: Definition, Purposes and Characteristics
- Classifications of Research
- Variable: Meaning and Types
- Historical Design
- Descriptive Design
- Experimental Design
- Sampling Design

Quarter 3: Introduction to Thesis Writing – Descriptive Design

- Parts of a Thesis: Preliminaries of Front Matter
- Parts of a Thesis: Chapter 1 Background of the Study
- Statement of the Problem
- Hypothesis (Experimental)
- Significance of the Study
- Scope and Delimitations
- Assumptions (Descriptive)
- Definition of Terms
- Theoretical and Conceptual Framework
- Conceptual Paradigm
- Chapter 2: Importance, Purposes and Functions
- Characteristics of Related Literature and Studies
- Foreign and Local Studies
- Synthesis of the Reviewed Studies

Quarter 4: Introduction to Thesis Proposal Writing (continued)

- Chapter 3: Research Design, Flow Chart, and Statistical Treatment
- Guidelines in Writing Chapter 3 of a descriptive design
- Guidelines in the Selection and application of statistical treatment
- Questionnaire Development and Validation
- Writing your Thesis Proposal

Science Research Content and Sequence in Research 3

Quarter 1: Non-parametric Test with Computer Application

- Normal distribution and Its Application to Research
- Inferential Statistics: Hypothesis Testing
- Non-parametric Test: Chi-square
- Spearman Rank Order Correlation
- Regression Analysis
- Correlation Analysis

Quarter 2: Chapters 4 and 5

- Chapter 4: Guidelines in Writing
- Review on Textual, Tabular, and Graphical Presentation

- Types of Data Analysis: Univariate, Bivariate, and Multivariate
- Implication, Inference, or Interpretation
- Chapter 5: Guidelines in Writing
- Parallelism among the Findings, Conclusions and Recommendations
- Abstract: Guidelines in Writing and Parallelism among Problem, Hypothesis, Methods and Results

Quarter 3: Introduction to Experimental Design

- Introduction to Medical and/or Scientific Terms
- Characteristics of Experimental Research
- Contemporary Issues and Trends in Experimental Designs (including Intel ISEF Rules)
- Generating Topics for Experimental Research
- Ethics in Research
- Internal Validity

Quarter 4: Thesis Proposal Writing (Experimental)

- Surfing the literature and analysis of methods and/or procedures used
- Understanding the test/s to be employed in the thesis proposal
- Identifying the data to be collected and the manner of statistical analysis
- Writing the Thesis Proposal

Science Research Content and Sequence in Research 4

Quarter 1: Refining the Thesis Proposal/ Conduct of Laboratory Tests

- Revisiting the Thesis Proposal:

- Background of the Study
- Statement of the Problem
- Hypothesis
- Significant of the Study
- Scope and Delimitations
- Definition of Terms
- Input-Process-Output Model
- IV-DV Model
- Literature
- Studies
- Research Design
- Flow Chart
- Materials and Procedures
- Statistical Treatment

Quarter 2: Parametric Test with Computer Application

- Parametric Test vs Non-parametric Test
- t-Test for Independent Samples
- t-Test for Correlated Samples
- Z tests on one sample and two samples
- Single Factor ANOVA
- Two-factor ANOVA with interaction
- Pearson r
- Special Topics 1 – 3

Quarter 3: Writing Chapters 4 and 5

- Writing Chapter 4: Presentation, Analysis and Interpretation of Data
- Writing Chapter 5: Summary of Findings, Conclusions and Recommendations

Quarter 4: Apprenticeship and Special Topics

- Apprenticeship
- Special Topics

Assessment of the Proposed Curriculum Competency Checklist for Research 1

Table 1. Level of Spiral Progression, Contextualization, Practicality, and

Acceptability of the of Proposed Curriculum for Research 1

Topic	<i>Spiral</i>		<i>Contextualized</i>		<i>Practical</i>		<i>Acceptable</i>	
	X	DE	X	DE	X	DE	X	DE
<i>Quarter 1:</i> <i>Science Processes and Attitudes</i>	4.70	VHS	4.60	VHC	4.70	VHP	4.75	VHA
Basic Concepts of S & T	4.80	VHS	4.60	VHC	4.80	VHP	4.80	VHA
Scientific Principles	4.60	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Limitations of Science	4.60	VHS	4.40	VHC	4.40	VHP	4.60	VHA
Scientific Attitudes	4.80	VHS	4.80	VHC	5.00	VHP	4.80	VHA
<i>Quarter 2:</i> <i>Basic Science Processes</i>	4.76	VHS	4.84	VHC	4.92	VHP	4.96	VHA
Science Process Defined	4.80	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Observing	4.80	VHS	5.00	VHC	5.00	VHP	5.00	VHA
Comparing	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Classifying	4.60	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Measuring	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
<i>Quarter 3:</i> <i>Integrated Science Processes</i>	4.73	VHS	4.73	VHC	4.77	VHP	4.83	VHA
Inferring	4.80	VHS	4.80	VHC	5.00	VHP	4.80	VHA
Predicting	4.60	VHS	4.60	VHC	4.80	VHP	4.60	VHA
Controlling variables	4.80	VHS	4.40	VHC	4.80	VHP	4.80	VHA
Interpreting data	4.60	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Formulating hypothesis	4.80	VHS	4.80	VHC	4.60	VHP	4.80	VHA
Experimenting	4.80	VHS	5.00	VHC	4.60	VHP	5.00	VHA
<i>Quarter 4:</i> <i>Scientific Method</i>	5.00	VHS	5.00	VHC	5.00	VHP	5.00	VHA
Steps of a Scientific Method	5.00	VHS	5.00	VHC	5.00	VHP	5.00	VHA
Grand Mean	4.80	VHS	4.79	VHC	4.85	VHP	4.89	VHA

Table 1 reveals that the proposed research curriculum competency checklist for Research 1 is Very Highly Spirally Progressive (X=4.80); Very Highly Contextualized (X=4.79); Very Highly Practical (X=4.85); and,

Very Highly Acceptable (4.89). Interestingly, the lesson on Scientific Method in Quarter 4 was rated with a perfect score of 5 by all the expert-evaluators.

Assessment of the Proposed Curriculum Competency Checklist for Research 2

Table 2. Level of Spiral Progression, Contextualization, Practicality, and

Acceptability of the of Proposed Curriculum for Research 2

Topic	<i>Spiral</i>		<i>Contextualized</i>		<i>Practical</i>		<i>Acceptable</i>	
	X	DE	X	DE	X	DE	X	DE
<i>Quarter 1: Descriptive Statistics with Excel Application</i>	4.66	VHS	4.74	VHC	4.91	VHP	4.94	VHA
Descriptive vs Inferential Statistics	4.60	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Levels of Measurement	4.60	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Textual, Tabular, and Graphical Presentation	4.40	VHS	4.60	VHC	4.80	VHP	5.00	VHA
Measures of Central Tendency	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Measures of Variability	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Shape of Distribution	4.60	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Excel Application in Statistics	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
<i>Quarter 2: Research and Sampling Designs</i>	4.46	VHS	4.63	VHC	4.80	VHP	4.77	VHA
Research: Definition, Purposes and Characteristics	4.40	VHS	4.60	VHC	4.80	VHP	4.80	VHA
Classifications of Research	4.20	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Variable: Meaning and Types	4.60	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Historical Design	4.60	VHS	4.60	VHC	4.80	VHP	4.80	VHA
Descriptive Design	4.60	VHS	4.60	VHC	5.00	VHP	4.80	VHA
Experimental Design	4.40	VHS	4.40	VHC	4.60	VHP	4.60	VHA
Sampling Design	4.46	VHS	4.63	VHC	4.80	VHP	4.77	VHA
<i>Quarter 3: Introduction to Thesis Writing – Descriptive Design</i>	4.57	VHS	4.73	VHC	4.49	VHP	4.63	VHA
Parts of a Thesis: Preliminaries of Front Matter	4.60	VHS	4.80	VHC	4.60	VHP	4.40	VHA
Parts of a Thesis: Chapter 1	4.60	VHS	4.80	VHC	4.20	VHP	4.80	VHA
Background of the Study	4.60	VHS	4.80	VHC	4.40	VHP	4.80	VHA
Statement of the Problem	4.60	VHS	4.80	VHC	4.40	VHP	4.60	VHA
Hypothesis (Experimental)	4.60	VHS	4.60	VHC	4.40	VHP	4.60	VHA
Significance of the Study	4.60	VHS	4.40	VHC	4.40	VHP	4.60	VHA
Scope and Delimitations	4.60	VHS	4.80	VHC	4.60	VHP	4.40	VHA
Assumptions (Descriptive)	4.60	VHS	4.80	VHC	4.60	VHP	4.80	VHA
Definition of Terms	4.40	VHS	4.60	VHC	4.20	VHP	4.80	VHA
Theoretical and Conceptual Framework	4.40	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Conceptual Paradigm	4.60	VHS	4.80	VHC	5.00	VHP	4.60	VHA
Chapter 2: Importance, Purposes and Functions	4.60	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Characteristics of Related Literature	4.60	VHS	4.80	VHC	4.00	VHP	4.00	VHA
Related Studies	4.60	VHS	4.80	VHC	4.60	VHP	4.80	VHA
Foreign and Local Studies	4.57	VHS	4.73	VHC	4.49	VHP	4.63	VHA
Synthesis of the Reviewed Studies	4.60	VHS	4.80	VHC	4.60	VHP	4.40	VHA

<i>Quarter 4: Introduction to Thesis Proposal Writing (contd)</i>	4.77	VHS	4.80	VHC	4.73	VHP	4.83	VHA
Chapter 3: Research Design, Flow Chart, and Statistical Treatment	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Guidelines in Writing Chapter 3 of a descriptive design	4.80	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Guidelines in the Selection and application of statistical treatment	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Questionnaire Development and Validation	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Writing your Thesis Proposal	4.80	VHS	4.80	VHC	4.60	VHP	4.60	VHA
Grand Mean	4.62	VHS	4.73	VHC	4.73	VHP	4.79	VHA

Table 2 reveals that the proposed research curriculum competency checklist for Research 2 is Very Highly Spirally Progressive (X=4.62); Very Highly Contextualized (X=4.73); Very Highly Practical (X=4.73); and, Very Highly Acceptable (4.79). It is interesting

to note that Quarter 1 on Descriptive Statistics with Excel Application received the highest weighted mean. This implies the significance that descriptive statistics plays in research development.

Assessment of the Proposed Curriculum Competency Checklist for Research 3

Table 3. Level of Spiral Progression, Contextualization, Practicality, and Acceptability of the of Proposed Curriculum for Research 3

Topic	Spiral		Contextualized		Practical		Acceptable	
	X	DE	X	DE	X	DE	X	DE
<i>Quarter 1: Non-parametric Test with Computer Application</i>	4.53	VHS	4.50	VHC	4.83	VHP	4.77	VHA
Normal distribution and Its Application to Research	4.60	VHS	4.60	VHC	5.00	VHP	4.80	VHA
Inferential Statistics: Hypothesis Testing	4.60	VHS	4.40	VHC	5.00	VHP	4.80	VHA
Non-parametric Test: Chi-square	4.60	VHS	4.20	VHC	4.60	VHP	4.60	VHA
Spearman Rank Order Correlation	4.40	VHS	4.60	VHC	4.80	VHP	4.80	VHA
Regression Analysis	4.60	VHS	4.60	VHC	4.80	VHP	4.80	VHA
Correlation Analysis	4.40	VHS	4.60	VHC	4.80	VHP	4.80	VHA
<i>Quarter 2: Chapters 4 and 5</i>	4.80	VHS	4.71	VHC	4.71	VHP	4.97	VHA
Chapter 4: Guidelines in Writing	4.80	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Review on Textual, Tabular, and Graphical Presentation	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Types of Data Analysis: Univariate, Bivariate, and Multivariate	4.80	VHS	4.40	VHC	4.40	VHP	5.00	VHA
Implication, Inference, or Interpretation	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Chapter 5: Guidelines in Writing	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA

Parallelism among the Findings, Conclusions and Recommendations	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
Abstract: Guidelines in Writing and Parallelism among Problem, Hypothesis, Methods and Results	4.80	VHS	4.80	VHC	4.80	VHP	5.00	VHA
<i>Quarter 3:</i> <i>Introduction to Experimental Design</i>	4.57	VHS	4.67	VHC	4.63	VHP	4.77	VHA
Introduction to Medical and/or Scientific Terms	4.40	VHS	4.60	VHC	4.60	VHP	4.60	VHA
Characteristics of Experimental Research	4.60	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Contemporary Issues and Trends in Experimental Designs (including Intel ISEF Rules)	4.60	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Generating Topics for Experimental Research	4.60	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Ethics in Research	4.60	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Internal Validity	4.60	VHS	4.80	VHC	4.60	VHP	4.80	VHA
<i>Quarter 4:</i> <i>Thesis Proposal Writing (Experimental)</i>	4.70	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Surfing the literature and analysis of methods and/or procedures used	4.80	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Understanding the test/s to be employed in the thesis proposal	4.60	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Identifying the data to be collected and the manner of statistical analysis	4.80	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Writing the Thesis Proposal	4.60	VHS	4.60	VHC	4.60	VHP	4.80	VHA
Grand Mean	4.65	VHS	4.62	VHC	4.69	VHP	4.83	VHA

Table 3 reveals that the proposed research curriculum competency checklist for Research 3 is Very Highly Spirally Progressive (X=4.65); Very Highly Contextualized (X=4.62); Very Highly Practical (X=4.69); and, Very Highly Acceptable (4.83). Noteworthy is

the observation that Quarter 2 in Writing Chapters 4 and 5 received the highest weighted mean. This implies the need to emphasize among the students the need to follow guidelines in writing Chapters 4 and 5.

Assessment of the Proposed Curriculum Competency Checklist for Research 4

Table 4. Level of Spiral Progression, Contextualization, Practicality, and Acceptability of the of Proposed Curriculum for Research 4

Topic	<i>Spiral</i>		<i>Contextualized</i>		<i>Practical</i>		<i>Acceptable</i>	
	X	DE	X	DE	X	DE	X	DE
<i>Quarter 1: Refining the Thesis Proposal/ Conduct of Laboratory Tests</i>	4.87	VHS	4.86	VHC	5.00	VHP	5.00	VHA
Revisiting the Thesis Proposal:	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Background of the Study	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Statement of the Problem	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Hypothesis	5.00	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Significant of the Study	5.00	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Scope and Delimitations	5.00	VHS	5.00	VHC	5.00	VHP	5.00	VHA
Definition of Terms	5.00	VHS	5.00	VHC	5.00	VHP	5.00	VHA
Input-Process-Output Model	5.00	VHS	5.00	VHC	5.00	VHP	5.00	VHA
IV-DV Model	4.80	VHS	5.00	VHC	5.00	VHP	5.00	VHA
Literature	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Studies	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Research Design	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Flow Chart	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Materials and Procedures	4.80	VHS	4.80	VHC	5.00	VHP	5.00	VHA
Statistical Treatment	4.87	VHS	4.86	VHC	5.00	VHP	5.00	VHA
<i>Quarter 2: Parametric Test with Computer Application</i>	4.80	VHS	4.60	VHC	4.98	VHP	5.00	VHA
Parametric Test vs Non-parametric Test	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
t-Test for Independent Samples	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
t-Test for Correlated Samples	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
Z tests on one or two samples	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
Single Factor ANOVA	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
Two-factor ANOVA with interaction	4.80	VHS	4.60	VHC	4.80	VHP	5.00	VHA
Pearson r	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
Special Topics 1 – 3	4.80	VHS	4.60	VHC	5.00	VHP	5.00	VHA
<i>Quarter 3: Writing Chapters 4 and 5</i>	4.80	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Writing Chapter 4: Presentation, Analysis and Interpretation of Data	4.80	VHS	4.80	VHC	4.80	VHP	4.80	VHA
Writing Chapter 5: Summary of Findings, Conclusions and Recommendations	4.80	VHS	4.80	VHC	4.80	VHP	4.80	VHA
<i>Quarter 4: Apprenticeship and Special Topics</i>	5.00	VHS	4.60	VHC	4.60	VHP	4.60	VHA
Apprenticeship	5.00	VHS	4.60	VHC	4.60	VHP	4.60	VHA
Special Topics	5.00	VHS	4.60	VHC	4.60	VHP	4.60	VHA
Grand Mean	4.87	VHS	4.72	VHC	4.85	VHP	4.85	VHA

Table 4 reveals that the proposed research curriculum competency checklist for Research 4 is Very Highly Spirally Progressive

(X=4.87); Very Highly Contextualized (X=4.72); Very Highly Practical (X=4.85); and, Very Highly Acceptable (4.85). Quarter 1 on

Refining the Thesis Proposal and the Conduct of Laboratory Tests received the highest weighted mean that puts importance on the need to revisit

CONCLUSIONS AND RECOMMENDATION

Based on the findings, the researcher concludes that the:

1. research curriculum competencies and the topic sequence can be developed through descriptive-developmental approach using available textbooks and other instructional references coupled with technical experience;
2. the proposed curriculum competency checklist are found to be very highly spiral, very highly contextualized, very highly practical, and very highly acceptable.

Based on the conclusions, the researcher recommends that:

1. the proposed curriculum competency checklist be adopted by education program supervisors in Science as reference and/or guide in their respective jurisdictions in the teaching of Research subjects in the Special Science Program; and
2. periodic evaluation and/or further validation of the proposed curriculum competency checklist may be instituted to further provide strengths on the spiral progression and contextualization of the competencies.

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