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Educational Research Association
The International Journal of
Educational Researchers 2019,
10 (4): 20-36
ISSN: 1308-9501

http://ijer.eab.org.tr

Development of an Instrument to Measure Practical Research Competencies in Senior High School

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Abstract

With the advent of the K to 12 basic education program, it gave birth to the senior high curriculum. Senior high school curriculum offers a wide range of subjects that will prepare young Filipinos to go for further studies, entrepreneur or employment. These subjects were grouped into specialized, core and applied. One of the subjects included in applied is research. There are four (4) research subjects: Practical Research 1, Practical Research 2, Inquiries, Investigation and Immersion and Research or Capstone Project (for STEM). Thus, it is expected that senior high school students will be research oriented individuals. With this, it is essential for teachers to identify the proficiency level of students in doing research. Thus, the researcher aimed to design and develop an instrument with established validity and reliability. This study utilized a design and development research approach to establish the empirical basis in the creation of an instrument to measure students' research competencies. Moreover, descriptive quantitative research design will be employed in validating the developed instrument. This will be done through the use of a validation checklist. A five - phase model was used to create an instrument. These phases involved Phase I - Review of Literature and Defining of Constructs, Phase II - Development of Items, Phase III - Designing of Checklist and Initial Try - Out, Phase IV - Content Validation and Initial Revision and Phase V –Pilot Testing and Final Revision. The developed instrument was named as Practical Research Competencies Inventory Checklist (RCIC). Experts validated the developed instrument and it obtained a Kappa value of 0.82 (almost perfect agreement) and an Aiken value of 0.89 (Valid). When subject for pilot testing and Cronbach's alpha was computed, it obtained a value of 0.96, which implies an excellent internal consistency reliability.

Keywords: Checklist, Design and Development, Reliability, Research Competencies, Validity

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Introduction

The K to 12 basic education programs is a new milestone in the educational system of the Philippines. This is considered to be a flagship program of the Department of Education (DepEd), which desires to come up with a curriculum which is aligned to the 21st century. The K to 12 basic education programs can be traced back in the year 2013, when the former president Benigno S. Aquino III, signed the Republic Act No. 10533, also known as the Enhanced Basic Education Act of 2013.

It is expected that every K to 12 graduates will be productive and responsible citizens who are equipped with necessary competencies and skills in different fields such as information, media and technology skills, learning and innovation skills, effective communication skills, and life and career skills. These competencies and skills are essential for them in choosing their own path in for further education, employment or entrepreneurship. To accomplish these aims, DepEd strictly implements Republic Act No. 10157 (Kindergarten Education Act) which all children at the age of 5 should avail kindergarten education. The Department of Education also decongested and enhanced the curriculum in the 6 years elementary education, created an enhanced 4 years junior high school curriculum, with an additional 2 years curriculum, which is the senior high school.

The senior high school curriculum offers a wide range of subjects from which students can choose a program leading to college or university entrance or a career in business or industry. There are four tracks created in which students can choose depending on their interest. These tracks are academic, sports, arts and design and technical vocational. In 2016, 60.6% of the senior high school students chose academic track, 39% technical vocational track, while the remaining percent were enrolled in sports and arts and design track (Sarmiento and Orale, 2016). Each track has its own strand, from which students can choose from.

The senior high school curriculum is composed of specialized subjects, core subjects and applied subjects. Specialized subjects are the 7 subjects with absolute different competencies and content that will prepare students for tertiary program they intend to pursue. Core subjects are the 15 subjects with same content and competencies to be taken by all Senior High School students regardless of specialization. Lastly, applied subjects are the 7 subjects that are true to all strands but are given a particular bent according to the nature of the strand.

The senior high school curriculum includes a research component which needs thorough motivation and student information literacy for them to complete the assigned research projects successfully (Barranoik, 2001). Thus, it is expected that senior high school students will be research – oriented individuals. A research – oriented student has the motivation to know more about existing and emerging problems; carefully investigates and systematically gathers information about certain events from a reliable source; and draw comprehensive conclusions and present recommendation based from gathered facts (Casinto, 2016).

Based from the curriculum guides mined from Department of Education (DepEd), there are four research subjects in the senior high school:

a) **Practical Research 1** or formerly known as Research in Daily Life 1, is an applied subject that aims to develop students' critical thinking and problem – solving skills through qualitative research. This is an 80 hours subject offered in the

second semester of Grade 11.

b) **Practical Research 2** or formerly known as Research in Daily Life 2, is an applied subject that aims to develop students' critical thinking and problem – solving skills through quantitative research. This is an 80 hours subject offered during the first semester of Grade 12. The prerequisite for this subject is Statistics and Probability.

c) **Inquiries, Investigation and Immersion** is an applied subject which prerequisite is Practical Research 1 and 2. This is an 80 hours subject offered during the second semester of Grade 12. This is a culminating activity that develop students' critical thinking and problem solving skills through qualitative, quantitative or mixed method. Thus, students are expected to conduct research, write a research paper and present it through oral presentation.

d) **Research or Capstone Project** is an alternative subject of Work Immersion for STEM students per DepEd Order No. 39, series of 2018. Students in this subject are expected to identify scientific, technological or mathematical problem, design and apply an appropriate methodology, formulate hypothesis and draw conclusions based on their investigation through the guidance of a research adviser. At the end of the semester students will prepare a scientific paper to be presented/defended in a forum. This is an 80 hours subject offered during the second semester of Grade 12.

Through DepEd Order No. 31, series of 2012 otherwise known as the Policy Guidelines on the Implementation of the K to 12 Basic Education Curriculum, schools are encouraged to implement the guidelines in creative and innovative ways, for the curriculum can be localized without compromising the philosophy of the total learner development. Thus, it was observed, schools with STEM strand composed of Practical Research 1 and 2, Inquiries, Investigation and Immersion and Work Immersion. While other schools offers Practical Research 1 and 2 and Research (Capstone) project.

Since research subjects are newly integrated in the basic education curriculum, it is essential to monitor the proficiency level of the students in different competencies in different research area. Students who failed to be competent in different research competencies, will have difficulty in conducting research when they will go for further studies. For instance, from 963 graduates in a university only less than half are able to state hypothesis, choose appropriate scale for qualitative variables, identify appropriate statistical test, identify research design and state elements of the introduction of a research proposal (Arellano et al., n.d.). In addition, being not too much competent in doing research, may also be reflected in their respective workplace. For instance, some accountancy faculty from State University and Colleges (SUCs) assessed their competencies in doing research as master or competent, while some are apprentice or somewhat competent in doing research (Mallari and Santiago, 2013).

Thus, it is important to have an instrument for practical research teachers to use in assessing students' research competencies. Identifying the competencies where the students are less competent can help them on what topic should be given more emphasis in their discussions and carefully plan on their teaching by enhancing the activities or developing supplementary material they are providing for their students.

Objectives of the Study

This study aimed to develop an instrument to measure the proficiency level of senior

high school students in performing the competencies in different research area. Specifically, it aims to

1. design and develop an instrument to measure the practical research competencies of senior high school students;
2. establish its content validity;
3. determine its internal consistency reliability.

Materials and Methods

In facilitating the gathering of data, methods will be used depending on the purpose and scope for which the study was undertaken. The study utilized the design and development research approach to establish the empirical basis in the creation of an instrument to measure students' research competencies. Moreover, descriptive quantitative research design will be employed in validating the developed instrument. This will be done through the use of a validation checklist.

Design and Development Process

The researcher utilized a five phase development model to create an instrument. The phases involved were presented in Figure 1.

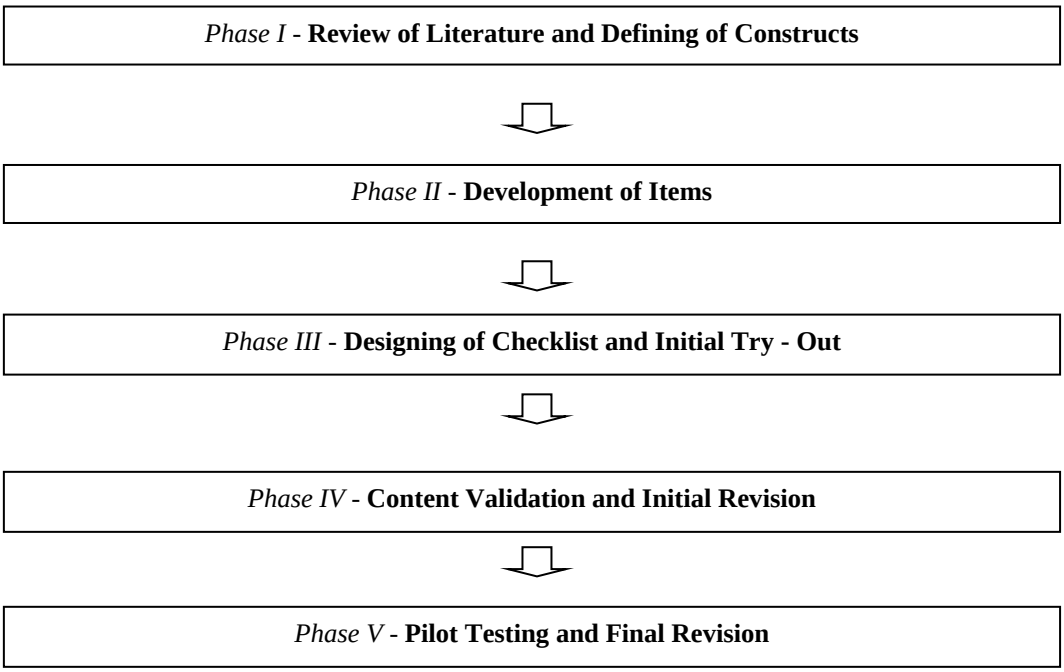

Figure 1. Five Phase Model in the Development of PRCIC

Phase I – Review of Literature and Defining of Constructs

There are different studies that aimed to investigate research capability or competencies. Some utilized a developed achievement test in research (e.g. Arellano et al., n.d.; Estacio, et al., 2018), while others utilized a developed checklist (e.g. Mallari and Santiago, 2013; Gomez and Panaligan, 2013; Formeloza and Pateña, 2013; Ciocon, 2018). However, it was observed that the items in the checklist used by these researchers, were too specific. Thus, it does not provide any other options for the respondents to choose. This gave the researcher an idea on how to design and develop a checklist, which will be named as Practical Research Competencies Inventory Checklist

(PRCIC).

More so, a review was done to determine the constructs to be considered in the process of research. The research process can be group into 4 areas (Arthur and Hancock, 2009). The 1st, 2nd and 3rd area were considered in this study, since it focuses on the main steps in doing research. The 4th area was excluded since it is more on finalizing the write ups of the study. Below are the definition of these areas:

a) **Research Conceptualization** is the first stage in research process where students will select a research topic, describe the background of the topic, formulate of objectives or research questions, cite the beneficiaries of the study, set scope, select literature, construct theoretical and conceptual framework, and define variables.

b) **Formulation of Research Method and Design** is the second stage in research process where students will formulate research method and design, select study sites, identify population, choose appropriate sampling method, construct valid and reliable research instrument, propose procedure for data collection, choose appropriate statistical tools and consider research ethics.

c) **Data Gathering, Processing and Analysis** is the third stage in research process where students will employ the data gathering plan, present data through tables or graphs, use statistical tool to analyze the data, interpret data, compose research findings, draw conclusion and provide recommendations.

Phase II – Development of Items

After identifying the defining the constructs in this study, items were developed. Items were pooled out from reliable research book (e.g. Casinto, 2016; Bueno, 2016; Calderon, 1993; Biological and Natural Science Faculty Thesis Guide, 2013). The other items were developed by the researcher. In the initial instrument, it has a total of 98 items. Wherein, 46 items belongs to the research conceptualization, 28 items belongs to formulation of research methods and design and 24 items belongs to the data gathering, processing and analysis. Table 1.a, 1.b and 1.c shows the sample items per research area.

Table 1.a. Sample Items for the Research Conceptualization

As a Practical Research Student, I can
12. define the terms in the study using
a) conceptual/ theoretical definition.
b) operational definition.

Table 1.b. Sample Items for Formulation of Research Methods and Design

As a Practical Research Student, I can
2. select study sites appropriately by
a) highlighting the characteristics of the place that meets the need of the study.
b) providing a map (if ecological study)

Table 1.c. Sample Items for Data Gathering, Processing and Analysis

As a Practical Research Student, I can
1. gather data using
a) observation.
b) interview or focus group discussion.
c) survey questionnaire.

Phase III – Designing of Checklist and Initial Try -Out

Since the researcher decided to come up with a checklist, it will be named as Practical Research Competencies Inventory Checklist (PRCIC). It is an instrument that can be used for student's self – assessment or the teacher will use it to assess student's research competencies. The developed instrument has four proficiency level (as shown in the table 2), unlike the existing one, they have five proficiency level. This is to avoid the "central tendency phenomenon", where respondents would simple choose the middle option without truly reflecting on the statements. The teacher or students will just encircle the current proficiency level in every competencies in doing research based on their best assessment.

Table 2. Proficiency Level in Doing Research

Level	Type	General Descriptions
4	Highly Competent	Has the knowledge or skill about the competency and is able to perform the task without additional support or guidance.
3	Competent	Has the knowledge or skill about the competency and is able to perform the task with some support or guidance.
2	Somewhat Competent	Aware of the competency but unable to perform the task without substantial assistance.
1	Not Competent	Unaware of the competency and is unable to perform the task without any lecture or training.

To make the developed Practical Research Competencies Inventory Checklist unique, this instrument requires the practical research teacher to conduct a gap analysis as shown in the table 3.

Table 3. Sample Appearance of the PRCIC

As a Practical Research Student, I can	Expected Proficiency Level	Current Proficiency Level				Gap
12. define the terms in the study using						
conceptual/ theoretical definition.		4	3	2	1	
operational definition.		4	3	2	1	

Gap analysis is a process that compares actual performance with the expected performance (Rouse, n.d.). It is being computed by subtracting the expected proficiency level to the current proficiency level. For senior high school, the expected proficiency level is competent (Estacio et al., 2018; Ciocon, 2018). In this study, competent has a numerical value of 3. For instance, if the current proficiency level of student ABC in define the terms in the study using conceptual/ theoretical definition is 3, while in using operational definition is 1, then the teacher should get first the mean which is 2. That is 3-2 = 1, which is interpreted as High Gap (see table 4). This denotes what action should be taken by the teacher to elevate the current proficiency level of the student in definition of terms.

Table 4. Interpretation of the Gaps

Rate	Interpretation	Remarks
1.50 – 2.00	Very High Gap	Action must be Taken
1.00 – 1.49	High Gap	Action must be Taken
0.50 – 0.99	Medium Gap	Action must be Taken
0.01 – 0.49	Low Gap	No Action
< 0.00	No Gap	No Action

Note, since the nature of the instrument is universal, meaning it can also be used in

assessing college students' research competency or even professionals, therefore the expected proficiency varies from the nature of the respondents. Thus, table 4 must be change.

The initial developed Practical Research Competencies Inventory Checklist undergo initial try - out using 10 senior high school students. This is to determine the clarity of the instruction and statements in every competencies in the developed instrument. The results were subjected in Cronbach's alpha and it obtained a value of 0.73 with a descriptive value as acceptable. It implies that the Practical Research Competencies Inventory Checklist is deemed reliable.

Phase IV – Content Validation and Initial Revision

There were 3 experts who validated the developed checklist. The first expert is a professor in a university whose expertise is in quantitative research. The second expert is a retired professor from a university whose expertise is in qualitative research. The third expert is a practical research teacher in a senior high school. The expert validated the Practical Research Competencies Inventory Checklist using the Validation Checklist for PRCIC. The Validation Checklist for PRCIC was developed by the researcher based on the guidelines for developing and validating an instrument provided by Tsang et al. (2017). Furthermore, it was also benchmark from existing Validators' Questionnaire Assessment of Awa (2013).

Kappa Statistics of Agreement will be used to determine the degree of agreement among panel members in evaluating the developed Practical Research Competencies Inventory Checklist. Table 5 shows the basis for interpreting Kappa value (Weiner, 2007).

Table 5. Interpretation of Kappa Value

Kappa Value	Level of Agreement
0.81 – 1.00	Almost Perfect
0.61 – 0.80	Substantial
0.41 – 0.60	Moderate
0.21 – 0.40	Fair
0.00 – 0.20	Slight
< 0.00	Poor

Moreover, the level of validity will be determined using Aiken Value of Validity. This will be computed using the formula:

$$V = \frac{\sum(r - lo)}{n\,(c - 1)}$$

Where lo is the lowest score which is 1, c is the highest score which is 4, r is average of all items for each validation aspects and n is the number of validator. Table 6 shows the basis for interpreting the Aiken Value of Validity (Elvionita et al., 2019).

Table 6. Interpretation of Aiken Value of Validity

Value	Category of Validity
$\geq$ 0.60	Valid
$\leq$ 0.60	Invalid

Revision of the developed Practical Research Competencies Inventory Checklist will be also carried based on the comments of the experts. From the original 98 items, 1 item

was deleted because it does not fit in the competency no. 3 under research conceptualization and another 3 items from competency no. 4 under data gathering, processing and analysis were removed because it were already emphasized in competency no. 6 under formulation of research methods and design. Thus, the new Practical Research Competencies Inventory Checklist has 94 items. Wherein, research conceptualization has 45 items, formulation of research method and design has 28 items and data gathering, processing and analysis has 21 items.

Phase V – Pilot Testing and Final Revision

The revised Practical Research Competencies Inventory Checklist were piloted in three schools. Permission were granted by the school Presidents and heads. There were a total of 165 senior high school students. On the appointed date, the researcher personally administered the pilot testing.

Cronbach's Alpha will be used to establish the internal consistency or reliability of the developed Practical Research Competencies Inventory Checklist. Table 7 shows the basis for interpreting the Cronbach's alpha value (George and Mallery, 2003).

Table 7. Interpretation of Cronbach's Alpha Value

Cronbach's Alpha Value	Interpretation
$\geq$ 0.90	Excellent
$\geq$ 0.80	Good
$\geq$ 0.70	Acceptable
$\geq$ 0.60	Questionable
$\geq$ 0.50	Poor
$\leq$ 0.50	Unacceptable

Reliability of the scale by item - total correlation will be determine in facilitating the final revision of the instrument, where in, it will serve as basis if there are some items need to be remove.

Results and Discussions

Validity of the Developed Practical Research Competencies Inventory Checklist. Table 8 shows the evaluation of the experts on the developed instrument. When data were subjected in Kappa Statistics of Agreement, it obtained a kappa value of 0.82. It implies that there is an almost perfect agreement among experts. Thus, there is a strong agreement among experts that all competencies listed are written in simple and orderly manner. That all competencies in the developed Practical Research Competencies Inventory Checklist are essentials in the process of doing research and are all aligned with the target competencies listed the subject Practical Research 1 and 2 curriculum guide. In addition, the three experts has a strong agreement that it can generate factual data within a time frame that can be used by the students and teachers.

In terms on its validity, it obtained an Aiken Value of 0.89. Thus, it implies that developed instrument is very valid. As a matter of fact, one of the experts suggested that the instrument can be used to evaluate the research output of the students. The other experts also suggested that it can also be used to assess the proficiency level of college students when enrolled in thesis writing course.

Table 8. Results of Experts Validation on the Developed Practical Research Competencies Inventory Checklist

Indicators	Expert 1	Expert 2	Expert 3
1. The RCIC evaluates what seeks to be measured in the study.	4	4	4
2. The RCIC distinguishes the properties of different attributes of the subjects under study.	3	4	4
3. The RCIC can generate factual data.	4	4	4
4. The RCIC can generate data within the time frame.	3	4	4
5. The RCIC is clear, simple and in order.	4	4	4
6. The RCIC can generate data which are valuable and of practical use to the respondents in the study.	3	4	4
7. The RCIC has influence on the variables being measured.	3	1	1
8. The competencies listed are congruent to the target competencies of the course Practical Research.	4	4	4
9. The competencies listed in the RCIC consistently and accurately measure each variables of the investigation.	4	4	4
10. All competencies listed in the RCIC are essentials in the process of doing research.	3	4	4
Mean	3.5	3.75	3.75
Kappa Value	0.82		
Aiken Value	0.89		

Internal Consistency Reliability of the Developed Practical Research Competencies Inventory Checklist. The computed Cronbach's alpha value of the developed instrument is 0.96, which means that there is an excellent internal consistency in the instrument. When break down according to research area, the research conceptualization with 45 items obtained a Cronbach's alpha value of 0.95, which is interpret as excellent; while formulation of research method and design with 28 items and data gathering, processing and analysis with 21 items obtained a Cronbach's alpha value of 0.85, which is interpreted as good.

Table 9 shows the reliability of the scale by item - total correlation, which reflects the groups with higher or lower scores. Based on the analysis made, the values per item range from 0.959 to 0.964.

Table 9. Correlation Items with Total Scale

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
RC - C1a	249.4722	1399.118	.615	.959
RC - C1b	249.3611	1402.484	.509	.959
RC - C1c	248.9236	1404.141	.405	.960
RC - C1d	249.1458	1403.342	.409	.960
RC - C1e	249.2083	1406.124	.367	.960
RC - C1f	249.2153	1400.688	.483	.959
RC - C2a	248.9097	1395.537	.583	.959
RC - C2b	249.2431	1400.017	.526	.959
RC - C2c	249.4514	1402.571	.466	.959
RC - C2d	249.2708	1402.996	.441	.959
RC - C2e	249.0486	1397.795	.534	.959
RC - C2f	249.2083	1398.460	.512	.959
RC - C3a	249.0833	1396.874	.567	.959
RC - C3b	249.1458	1393.790	.594	.959
RC - C3c	249.1528	1400.690	.499	.959
RC - C3d	249.1806	1397.422	.488	.959
RC - C4a	249.2639	1400.755	.518	.959

RC - C4b	249.1875	1393.356	.603	.959
RC - C4c	249.4236	1400.036	.521	.959
RC - C4d	249.3056	1398.731	.508	.959
RC - C5a	249.0903	1398.460	.560	.959
RC - C5b	249.1319	1390.157	.648	.959
RC - C5c	249.1250	1408.362	.298	.960
RC - C5d	249.2708	1395.933	.571	.959
RC - C6a	248.9236	1394.672	.593	.959
RC - C6b	249.4722	1403.636	.463	.959
RC - C6c	249.2569	1393.185	.634	.959
RC - C6d	249.0556	1398.179	.503	.959
RC - C7a	249.0903	1395.551	.591	.959
RC - C7b	249.0972	1398.074	.509	.959
RC - C8a	248.9514	1396.494	.517	.959
RC - C8b	249.0278	1397.440	.463	.959
RC - C8c	249.4375	1398.318	.503	.959
RC - C9a	248.7153	1401.911	.452	.959
RC - C9b	249.5417	1394.264	.575	.959
RC - C9c	249.2500	1394.552	.566	.959
RC - C9d	249.3889	1396.631	.529	.959
RC - C9e	249.3750	1396.432	.532	.959
RC - C10a	249.0417	1393.355	.596	.959
RC - C10b	248.8264	1391.613	.567	.959
RC - C11a	249.2569	1395.171	.605	.959
RC - C11b	249.2153	1394.142	.630	.959
RC - C11c	249.2083	1395.928	.544	.959
RC - C12a	249.1042	1393.409	.564	.959
RC - C12b	249.2917	1394.586	.579	.959
MD - C1a	248.9028	1392.914	.629	.959
MD - C1b	249.0556	1398.864	.519	.959
MD - C1c	248.8889	1389.624	.153	.964
MD - C2a	249.0208	1396.286	.572	.959
MD - C2b	249.4514	1397.368	.515	.959
MD - C3a	249.0417	1395.411	.558	.959
MD - C3b	249.0347	1396.062	.540	.959
MD - C3c	248.8264	1398.662	.533	.959
MD - C3d	249.1111	1396.169	.520	.959
MD - C4a	249.1736	1398.228	.513	.959
MD - C4b	249.4444	1407.647	.452	.959
MD - C4c	249.3403	1401.233	.525	.959
MD - C4d	249.4653	1398.237	.494	.959
MD - C5a	248.6875	1398.258	.542	.959
MD - C5b	248.9236	1399.959	.541	.959
MD - C5c	248.9931	1397.126	.576	.959
MD - C5d	249.2431	1397.612	.585	.959
MD - C6a	249.1458	1396.307	.563	.959
MD - C6b	249.3333	1401.301	.460	.959
MD - C6c	249.5556	1401.479	.503	.959
MD - C6d	249.4236	1397.589	.522	.959
MD - C7a	248.9028	1368.746	.257	.963
MD - C7b	248.6528	1400.004	.494	.959
MD - C7c	249.1042	1396.709	.499	.959
MD - C7d	249.0625	1396.688	.490	.959
MD - C7e	248.5139	1400.140	.528	.959
MD - C7f	249.0625	1402.157	.392	.960
MD - C7g	249.3056	1401.109	.433	.959

DA - C1a	248.5694	1362.219	.295	.963
DA - C1b	248.8125	1400.629	.510	.959
DA - C1c	248.5764	1402.470	.451	.959
DA - C2a	249.2847	1386.862	.688	.959
DA - C2b	249.1250	1395.327	.577	.959
DA - C2c	249.0764	1397.707	.487	.959
DA - C3a	249.1111	1390.827	.624	.959
DA - C3b	249.4583	1398.152	.531	.959
DA - C4a	249.2083	1393.075	.597	.959
DA - C5a	249.2708	1397.528	.566	.959
DA - C5b	248.7986	1377.547	.226	.963
DA - C5c	249.4444	1395.857	.582	.959
DA - C5d	249.1806	1391.659	.655	.959
DA - C6a	248.9653	1394.635	.610	.959
DA - C6b	249.0347	1397.824	.538	.959
DA - C7a	249.1528	1391.990	.675	.959
DA - C7b	249.1181	1397.699	.559	.959
DA - C7c	249.2361	1398.629	.575	.959
DA - C8a	248.9236	1394.644	.547	.959
DA - C8b	249.0486	1398.746	.531	.959
DA - C8c	249.1528	1391.795	.598	.959

Legend:

RC – Research Conceptualization

MD – Formulation of Research Methods and Design

DA – Data Gathering, Processing and Analysis

C – Competency Number

Conclusion and Recommendations

The development of an instrument to measure the Practical Research Competencies were carried using five (5) phase model. This instrument is named as Practical Research Competencies Inventory Checklist. The competencies were grouped into three research areas: research conceptualization, formulation of research method and design and data gathering, processing and analysis. Experts validated the developed instrument and it obtained a Kappa value of 0.82 (almost perfect agreement) and an Aiken value of 0.89 (Valid). When subject for pilot testing and Cronbach's alpha was computed, it obtained a value of 0.96, which implies an excellent internal consistency reliability.

The researcher recommends to pilot test again the developed instrument using junior high school and college students. This is to ensure, that the developed instrument can be generic.

Acknowledgment

The researcher would like to express his deepest gratitude to the Department of Science and Technology – Science Education Institute (DOST - SEI) for the study grant. The researcher would like also to express his warmest thanks to the experts who gave their precious time to validate the instrument, and to the school Presidents and heads who allowed the pilot testing of the instrument in their respective schools.

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Appendices

RESEARCH COMPETENCIES INVENTORY CHECKLIST

Instructions: The ***Research Competencies Inventory Checklist*** is designed to assess and determine honestly and accurately your proficiency level for each identified competencies in different research area. First, please fill in the required information. Then, encircle only the current level of your proficiency in doing research according to your best assessment. There are four (4) proficiency levels with corresponding descriptions indicated in the succeeding table.

Respondent's Code: _____ School: _____

Level	Type	General Descriptions
4	Highly Competent	Has the knowledge or skill about the competency and is able to perform the task without additional support or guidance.
3	Competent	Has the knowledge or skill about the competency and is able to perform the task with some support or guidance.
2	Somewhat Competent	Aware of the competency but unable to perform the task without substantial assistance.
1	Not Competent	Unaware of the competency and is unable to perform the task without any lecture or training.

A. RESEARCH CONCEPTUALIZATION

Research Competency As a Practical Research Student, I can	Expected Proficiency Level	Current Proficiency Level				Gap
1. identify research topic based on						
a) recommendations in a published or unpublished studies.		4	3	2	1	
b) school's research agenda.		4	3	2	1	
c) consulting other people like teachers, parents and friends.		4	3	2	1	
d) personal experience.		4	3	2	1	
e) current events through social media, TV or radio.		4	3	2	1	
f) books, magazines, journal articles and other research references.		4	3	2	1	
2. select research topic based on						
a) researcher's interest and ability.		4	3	2	1	
b) researcher's strand or field of expertise.		4	3	2	1	
c) availability of facilities/ equipment/ tools.		4	3	2	1	
d) how significant and timely.		4	3	2	1	
e) how researchable the topic is.		4	3	2	1	
f) how feasible the topic is.		4	3	2	1	
3. construct research titles that						
a) indicate accurately the subject and scope of the study.		4	3	2	1	
b) create a positive impression and stimulate readers interest.		4	3	2	1	
c) identify key variables of the study.		4	3	2	1	
d) is limited to 10 to 15 words.		4	3	2	1	

4. describe the background of the research by						
a) outlining the historical development in the literature leading to the current topic.		4	3	2	1	
b) highlighting the research topic from broader to specific perspective.		4	3	2	1	
c) establishing the knowledge gaps.		4	3	2	1	
d) citing literatures but not to give methods, results and discussion.		4	3	2	1	
5. formulate research questions that can be investigated which are						
a) congruent to the research topic.		4	3	2	1	
b) clearly stated, precise and accurate.		4	3	2	1	
c) not answerable by yes or no.		4	3	2	1	
d) defined as to the type of data to be generated.		4	3	2	1	
6. cite the target beneficiaries with the specific benefits such as						
a) solution to a problem.		4	3	2	1	
b) economic upliftment.		4	3	2	1	
c) contribution to the pool of knowledge.		4	3	2	1	
d) impact in the community/ school/ environment.		4	3	2	1	
7. indicate the scope and boundaries of the study by						
a) confining the things to be included in the study.		4	3	2	1	
b) emphasizing the things to be excluded in the study.		4	3	2	1	
8. select relevant literature that are related to the present study by						
a) selecting the books, published and unpublished thesis in the library, research journals and other related references.		4	3	2	1	
b) accessing research database like google scholar, ProQuest, etc.		4	3	2	1	
c) accessing the official data, records and documents both from government and nongovernment agencies.		4	3	2	1	
9. draw out and manage information from different literatures using						
a) note taking/ recording.		4	3	2	1	
b) matrix.		4	3	2	1	
c) graphic organizers.		4	3	2	1	
d) indexing.		4	3	2	1	
e) annotation.		4	3	2	1	
10. cite literatures and related studies						
a) based on the nature and variables of the study.		4	3	2	1	
b) using appropriate citation format (e.g MLA, APA).		4	3	2	1	
11. construct theoretical – conceptual framework						
a) by adapting the generated theories and findings from different studies.		4	3	2	1	
b) by identifying the variables of the study as applied to the present study.		4	3	2	1	
c) to show the relationship among variables in a researcher – made framework.		4	3	2	1	
12. define the terms in the study using						
a) conceptual/ theoretical definition.		4	3	2	1	
b) operational definition.		4	3	2	1	

B. FORMULATION OF RESEARCH METHODS AND DESIGN

Research Competency As a Practical Research Student, I can	Expected Proficiency Level	Current Proficiency Level				Gap
1. choose the most appropriate research design based on						
a) the objectives of the study.		4	3	2	1	
b) the type of data needed.		4	3	2	1	
c) the method in analysing data.		4	3	2	1	
2. select study sites appropriately by						
a) highlighting the characteristics of the place that meets the need of your study.		4	3	2	1	
b) providing a map (if ecological study)		4	3	2	1	
3. describe and choose the sample of the study by						
a) highlighting the characteristics of the respondents that meets the need of your study.		4	3	2	1	
b) determining the sample size appropriately.		4	3	2	1	
c) using probability sampling (e.g. random sampling).		4	3	2	1	
d) using nonprobability sampling (e.g. purposive sampling)		4	3	2	1	
4. construct research instruments by						
a) setting the objectives of the instrument.		4	3	2	1	
b) pooling items/ statements that measure what seeks to be measured.		4	3	2	1	
c) establishing its content validity.		4	3	2	1	
d) establishing its reliability (e.g. the use of KR20 or Cronbach's alpha).		4	3	2	1	
5. propose proper data gathering procedures which includes						
a) asking permission and approval from the institution where the respondents come from.		4	3	2	1	
b) how to administer the observation/ interview/ survey.		4	3	2	1	
c) date on the administration of the observation/ interview/ survey.		4	3	2	1	
d) how to perform the treatment in the study (if experimental).		4	3	2	1	
6. select the appropriate statistical tool in analysing data based on the posited objectives						
a) descriptive statistics (e.g. frequency and percentage).		4	3	2	1	
b) inferential statistics (e.g. mean and standard deviation).		4	3	2	1	
c) establishing statistical relationships among variables (e.g. Pearson product-moment correlation coefficient and chi-square test).		4	3	2	1	
d) establishing statistical differences between groups (e.g. T-test and F-test).		4	3	2	1	
7. impose appropriate ethics in research by						
a) asking permission from the author to use the research instruments for the purpose of the study.		4	3	2	1	
b) paraphrasing and citing the authors to avoid plagiarism.		4	3	2	1	
c) securing assent form (if respondents are below 18 years old)		4	3	2	1	
d) securing informed consent form (if respondents are 18 years old and above).		4	3	2	1	
e) protecting the identity of the respondents.		4	3	2	1	

f) following the protocol for animals used in the research.		4	3	2	1	
g) performing treatment reversal (example: Treatment will be given to group A, while group B will have no treatment. After a certain period, treatment will be given to group B, while group A will not receive any treatment.)		4	3	2	1	

C. DATA GATHERING, PROCESSING AND ANALYSIS

Research Competency As a Practical Research Student, I can	Expected Proficiency Level	Current Proficiency Level				Gap
1. gather data using						
a) observation.		4	3	2	1	
b) interview or focus group discussion.		4	3	2	1	
c) survey questionnaire.		4	3	2	1	
2. present data in						
a) tabular form.		4	3	2	1	
b) graphical form.		4	3	2	1	
c) text form to discuss results and cite implications.		4	3	2	1	
3. infer and explain qualitative data using						
a) basic statistics like frequency and percentage.		4	3	2	1	
b) thematic analysis or building patterns.		4	3	2	1	
4. process statistical techniques to analyze quantitative data						
a) using appropriate statistical technique.		4	3	2	1	
5. present results in/ by						
a) logical order based on the order of the research objectives.		4	3	2	1	
b) accurately and reliably manner.		4	3	2	1	
c) no repetitive manner (e.g. data presented in graph, no longer presented in tabular form).		4	3	2	1	
d) showing the relationship between the data gathered and existing studies.		4	3	2	1	
6. create a coherent summary that						
a) contains the purpose of the study, respondents and methods.		4	3	2	1	
b) highlight the findings based on the data gathered.		4	3	2	1	
7. draw conclusions from research findings that is						
a) aligned with the objectives.		4	3	2	1	
b) factually learned from the study.		4	3	2	1	
c) concised, yet conveyed all necessary information.		4	3	2	1	
d) 8. formulate recommendations that						
e) suggest possible solutions that needs further study.		4	3	2	1	
f) recommends action to be taken.		4	3	2	1	
g) suggest possible research topics which were unable to cover in the study.		4	3	2	1	