# Institutional Culture As Predictors Of Research Competence Among Educators In Basic Education

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**Abstract.** With the pressing demand for specialized skills among Senior High School teachers teaching and supervising Research Subjects, this predictive-cross-sectional study investigated on the predictors of research competence among Practical Research Teachers in the Philippines. Five (5) factors of institutional research culture were examined as to their relationship with and predictive influence on teachers' research competence. Using the descriptive phase of the study, results have revealed that the senior high school teachers have perceived that the five factors of institutional research culture are implemented at moderate to fairly high levels. They were also found to exhibit pertinent research skills at fairly high to very high level only except for statistical skills. Meanwhile, using the Multiple Linear Regressions Analysis, it was manifested that among the factors investigated only "working condition" was found to be a positive predictor of teachers' research competence. The findings of the study accord with the Social Cognitive Career theory and strengthen the propositions on the significant influence of work environment in shaping work competencies.

**Key words:** Practical Research Teachers; Research Teaching; Research Competence; Predictive Study; Multiple Linear Regression

# I. INTRODUCTION

The advancement of humanity has been directly linked to research and development. At the national, regional, and international levels, research is a fundamental source of knowledge and innovation, and is intimately tied to development (Meek, Teichler, & Kearney, 2009).

In the aspect of education, research is vital in improving the quality of teaching and learning and is recognized as the basis for reforms and policy development (Anub, 2020). As a matter of fact, engagement in research among academic professionals is inspired because of the great influence or effect it has on the operation of the school system (Zulueta & Perez, 2010). Livingstone (2005) of the UNESCO-International Institute for Educational Planning (IIEP) on Basic Elements of Research Design underscores that in an ideal world, studies have proven that educational research serve as a pillar in education. Moreover, it is also crucial in fueling novel practices and is essential in developing innovative procedures and materials to improve teaching and learning experiences. More importantly, the function of educational research is giving data-driven information to contribute to strategic decisionmaking for the improvement of educational policies.

In the Philippines, Higher Education has the primordial mandate to conduct research, while in the basic education it is simply secondary to the teaching tasks of teachers. Recently, however, the conduct of educational research in basic education has been reinforced through various legal provision such as Republic Act 9155 or the Governance of Basic Education Act of 2001 (Chapter 1, Section 7 (5), RA 9155) mandating the Department of Education (DepEd) to "undertake educational research and studies" which can become part of the basis for necessary reforms and policy inputs. Also, DepEd Order 43, s. 2015 or Revised Guidelines for the Basic Education Research Fund (BERF) further emphasizes this as it called for evidence-based policy development through the institution of reforms strengthen transparency that and accountability (DepEd Order No. 43, s. 2015). In conjunction with this, funding facility has been given as a support for research through the Basic Education Research Fund (BERF) under DepEd Order No. 24, s. 2010. The said fund was made available to internal and external research practitioners who meet the minimum eligibility requirements. Currently,

DepEd Order No. 43, s. 2015 strengthened this program with the revised guidelines for BERF.

Meanwhile, in trying to realize the value of research in the country's development, at the onset of the Enhanced Basic Education Curriculum-K-12 Program, DepEd has entrenched two Practical Research subjects in its Senior High School curriculum as part of the salient features in the Applied or Contextualized Subjects. Its main rationale is to enhance the students' critical thinking as well as problem-solving skills as they go through experiential learning. Since research is an advanced course for 21st-century learners, it requires highly skilled teachers who are good in both pedagogy and research techniques. This is imperative since teaching and research are core activities of teachers (Zubrick, Reid, & Rossiter, 2001). The school's development and continuous drive towards excellence is achieved through teacher's research competence.

In an attempt to understand and identify the constructs that encompass research skills necessary for the performance of research activities, Meerah et al (2012) synthesized several literatures. It was found that there are several components involved in research skills. However, the synthesis resulted to five categories, namely: Information-seeking Skills, Statistical Skills, Methodology Skills, Problem-Solving Skills, and Communication Skills.

Meanwhile, despite various efforts to fully embrace research undertakings on top of teachers' regular teaching functions, teachers still face challenges in doing research. Many studies have confirmed that teachers are indeed struggling with research. For instance, Ulla (2017), Ellis and Loughland (2016), and Vasquez (2017) found that lack of financial support, insufficient research knowledge, and skills, heavy teaching loads are some of the obstacles teachers face in realizing research functions. Similar findings also emerged in the study of Zhou (2012) specifying that teachers were not confident in their acquired research skills and did not have a clear understanding of research. Gonzales, Corpuz, and Dellosa (2020) also unraveled that public school teachers are only moderately capable in research and research dissemination.

"Scientific competencies form the basic kernel of the competencies that the research world expects from any researcher, whether working in a public or private sector, and whether a junior or senior researcher" (APEC, Deloitte, p. 26). As a process of knowledge building, a teacher is motivated to grow and develop as a research teacher. According to Karlibaeva (2021), competencies of future research teachers pass through gradual formation of mental actions. The first stage is familiarization of basic the research competencies, second stage is the mastering of basic research knowledge and skills, and the third and final stage is the processing of basic knowledge and skills in the development of professional training. To belong to the third stage, a competent researcher should be able to carry out a thorough research in various contexts armed with the necessary skills, knowledge, attitudes, and values and is aware of what are happening in the world both locally

and globally and its impact to education (Niemczyk, 2018). Moreover, research competencies in this stage, as established by Mogonea and Mogonea (2019), are knowledge attainment, recognition of present problems in education, knowledge of innovative research methods, development of new research tools, and the ability to interpret and disseminate results. In addition to this, while competent researchers acquire more research skills, their role shifts to that of a research trainer, hence the transfer of skills occur (OECD, 2013). As studied by Toquero\_(2020), based on the above-mentioned aspects, it is therefore assumed that when teachers' competence towards research is high, they see themselves as capable of accomplishing it which eventually results in producing better students' research outcomes. To sum up all the skills required of a competent researcher, a rocksolid foundation of scientific knowledge and skills are requisite and vital.

These assumptions are supported by various theories, one of which is the new theory developed by Robert W. Lent, Steven D. Brown, and Gail Hackett in 1994 called Social Cognitive Career Theory (SCCT). The theory consisted of models of academic and career interest, choice, and performance (Lent, Brown, & Hackett, 1994). Moreover, its principal assumption is built on the interconnection among these given parameters namely interests, abilities, values, and environmental factors and has been proven to have an impact on one's career development (Lent, Brown, & Hackett, 2002). As Lent posited (2005), the objective, therefore, of

SCCT is to discover the connections between individuals and their career-related context; hence, it makes an attempt to take into consideration the entire environment in which the individuals make decisions related to their career. In other words, SCCT postulates that an interest will be a powerful factor of the choices that individuals make under an encouraging and supportive environment rather than a limiting and restrictive environmental condition. When the latter conditions are prevalent, people may concede their interest for a more sensible and suitable conditions. Adversely, individuals are likely to delve deeper into their chosen interest when they see themselves competently performing as they perceive the activity to produce significant results.

On this note, it is believed that successful institutions are those that provide significant support to faculty research efforts thereby developing a culture of research and increase faculty research productivity. Hanover-Research (2014) identifies influential factors behind the development of a culture of research, based on a review of secondary literature and institutional practices. Researchcantered institutions provide supports which include effective leadership and clear goals, faculty training and support programs and research centers. Clemena and Acosta Model (2016) also suggest various indicators to assess the research culture of institutions. The indicators are Institutional research policies agenda, Departmental culture and and working, Working conditions, Budget for research, Infrastructure, Collaboration with

and access to research professionals in other institutions, Policies and guidelines on research benefits and incentives, Research committee and Publications.

However, many research teachers do not pursue their research interests because they are restricted by their experiences collectively labeled as "environmental influences" (Lent, Brown, & Hackett, 2002). Experiences such as pressing needs, family burdens, and other complications push these research teachers to compromise their research interests and instead, drive them to make choices based on practical decisions or worst, their interests are set aside for the time being until such time that the "environmental influences" are eased.

Lent et al (2002) have also postulated that performance done in the past have a great impact on individuals' belief in their capacity to carry out specific functions and their expectancies which then has an impact on future behavior. According to Fouad, (2014), among the three models, the most powerful influence on self-efficacy and competence is the performance. As Lent et al (2002) contend individuals who set higher levels of performance goals for themselves are able to manage their skills more effectively and persist longer even at the onset of setbacks causing positive outcome expectations. The choice of SCCT to determine the institutional factors as predictors of research competence among senior high school teachers is a reasonable framework for this study.

As proven by the abundance of literature, high competence translates to effective performance. However, based on reviewed 10031

literatures, majority of researchers have placed attention on describing competence and factors that hinder research productivity while few have attempted to shed light on factors which can significantly predict competence and performance. Hence, there is a dearth in literature available on these areas.

It is from these foregoing premises that this study was inspired and prompted in order to create a local data bank which will describe teachers' research competence all geared towards fully understanding the mechanisms and factors which influence teaching and learning process in the aspect of research education. Further, this attempt was deemed imperative as this will not only provide essential baseline information helpful for educational policy makers' decision making, but at the same time it will draw clear cut pictures on areas needing remediation and improvement particularly research on knowledge and skills, collectively termed as competence (Merriam-Webster, Inc., 2021) in this study, which are theorized to dramatically impact job performance and ultimately satisfaction.

This study generally aimed at examining factors that influence the research competence of practical research teachers in hopes of providing inputs to developing intervention programs and in designing extension activities. Specifically, the study addressed the following specific questions:

 What is the level of institutional research culture as perceived by practical research teachers, in terms of the following indicators:

- 1.1. Working conditions
- 1.2. Research sharing and collaboration
- 1.3. Research infrastructure
- 1.4. Institutional policies and agenda
- 1.5. Research monitoring and mentoring
- How do respondents describe their level of competence in research in terms of the following specific skills:
  - 2.1. Information-seeking Skills
  - 2.2. Statistical Skills
  - 2.3. Methodology Skills
  - 2.4. Problem-Solving Skills
  - 2.5. Communication Skills
- 3. Which among the indicators of institutional culture can best predict the research competence of practical research teachers?

# 2. METHODOLOGY

#### 2.1. Research Design

The entirety of the study employed the Crosssectional Predictive Design (Johnson, 2001) as it generally aimed at identifying factors that influence teachers' research competence. Initially, it took the descriptive aspect through survey in order to determine the institutional research culture and the research skills of practical research teachers. It then later utilized the correlation design in trying to establish the relationship between the predictive and outcome variables. Finally, the study advanced to a predictive aspect in trying to identify predictive variables which can significantly predict research competence. This was done by utilizing multivariate analysis through multiple linear regressions.

#### 2.2. Respondents of the Study:

The respondents were 65 senior high school teachers assigned in delivering instruction for Practical Research 1 and 2 subjects of the Enhanced Basic Education Curriculum-K-12 Program. In the selection of respondents, the following inclusion and exclusion criteria were followed:

#### Inclusion Criteria:

- Must have been teaching either practical research 1 or 2 subjects in the senior high school level;
- Must have been in the service for three (3) years by the time the study commences;
- Must have been appointed with regular permanent item or at least probationary;
- 4. Available and willing to participate in the study.

### **Exclusion Criteria:**

- 1. Those assigned at the Junior High School level.
- 2. With teaching experience less than three (3) years.
- Not willing to participate in the study.

#### 2.3. Sampling Procedure:

Non-Probability Purposive Sampling was utilized in the selection of respondents of the study. This technique was selected to ensure that those who were invited to take part in the study were considered based on predetermined criterion set by the researchers to purposely attain the research objectives. Since there were no available database that would help researchers in identifying the respondents, the snowball sampling was utilized just so the minimum number of respondents required for a quantitative study will be met which according to Sekaran (2003) should be greater than 30 and at least lesser than 500.

#### 2.4. Research Instrument

To describe the level of institutional research culture, the Institutional Research Culture Scale developed and validated by Jayachandran and Chandrasenan (2021) was utilized. The instrument is composed of 28 items grouped into five (5) components and evaluated using a five-point Likert Scale as follows: 5- Strongly Agree, 4- Agree, 3-Neutral, 2- Disagree, 1-Strongly Disagree. The instrument indicates strong evidence of reliability with an acceptable level of Cronbach's alpha ( $\alpha$ ) = 0.78. Given the factor loadings and the evidence of reliability, all the items were found capable for assessing the institutional research culture.

То measure respondents' research competence, а five-point Likert-type instrument was adapted from Meerah et al (2012). The instrument captures five (5)research-related skills, namely: Informationseeking Skills, Statistical Skills, Methodology Skills, Problem-Solving Skills, and Communication Skills. Internal consistency method was used to calculate the reliability of the test. From the output of the reliability test, results showed that the reliability of the test and its construct have reached moderately high coefficient indicating its reliabilities.

2.5. Data Gathering Procedure:

In view of the current mobility restriction imposed by the continuing wrath of the COVID-19 pandemic, collection of data deviated from the conventional formal face-totraditionally face approach used for administering surveys. For this study, all set of questionnaires were prepared using Google Forms. Upon preparing the Google Forms, access link were provided to few known respondents. They were requested to forward the same to other teachers who qualify for the inclusion and exclusion criteria set for the study. In trying to ensure that the data gathering process adheres to acceptable ethical standards, first part of the survey questionnaire included the Consent Form specifying details of the ethical considerations the researcher will strictly follow during the entire data collection.

# 2.6. Data Analysis:

To successfully arrive at meaningful interpretation emanating from sound analysis of data, tabulated data were analyzed using appropriate descriptive and inferential statistical treatments.

Summated mean scores and standard deviations per indicators were calculated to express the level of institutional research culture and the research competency level of the respondents. This is consistent to the suggestions of Deselle (2005) and the propositions on the appropriate use of multiple statements in Likert Scale as reported by (Warmbrod, 2014).

Since summated or over-all scores from the Likert Scale were utilized for correlation, parametric test on relationship was applied specifically the Pearson Product Moment correlation. This accords the idea that "overall Likert-scale data is often treated as interval because it is a composite score made from adding answers to 4 or more questions (Bhandari, 2020)."

Finally, the multiple linear regressions were then applied in order to address the final objective of the study on identifying possible predictors of research competence. All inferential tests advanced at 0.05 level of significance and 95% confidence level.

#### 3. RESULTS AND DISCUSSION

The study primarily aimed at exploring the predictive potential of the five domains of institutional culture in predicting the research competence of SHS teachers. In the succeeding sections, results of the descriptive and inferential analyses are presented and discussed.

# 3.1. Level of Institutional Research Culture

The five institutional research culture indicators of as predictors research competence among senior high school teachers are summarized in Table 1 in terms of the means, standard deviations, skewness, and kurtosis values. Except for the institutional policy indicator, all mean scores were above the midpoint of 3.0. The participants had the highest mean score in the working conditions indicator, implying that these senior high school practical research teachers have a strong belief that the institution for which they work provides a positive working environment that has a significant impact on their research Meanwhile, the participants productivity.

obtained the lowest mean score in the institutional policy indicator, suggesting that the institution they are working for do not provide clear-cut guidelines, protocols, and standards to increase their productivity of research. The research infrastructure indicator's mean score suggests that senior high school research teachers believe their institution adequately offers the facilities, resources, and services that they need to conduct research, since these factors influence their success as research teachers. Meanwhile, the calculated standard deviations for all scores indicate that participants' responses on all measures are dispersed very narrowly. Further, the kurtosis and skewness readings were so low that none of them exceeded 1.0, implying that the data was normal.

Table 1. Descriptive statistics for institutional research culture

Institutional Research Culture Indicators	Mean*	Std. Deviation	Skewness	Kurtosis
Working Conditions	3.684	0.701	-0.417	0.205
Research Collaboration	3.33	0.856	-0.113	0.072
Research Infrastructure	3.054	0.96	0.154	-0.256
Institutional Policy	2.987	1.034	0.132	-0.506
Research Monitoring	3.298	0.914	-0.146	0.054
Institutional Research Culture	3.271	0.815	0.11	0.113

\*Legend: 4.2-5.0=Very High; 3.4-4.19=High; 2.6- 3.39=Moderate; 1.8-2.59=Low; 1.0-1.79=Very Low

#### 3.2 Level of Research Competence

The level of research competence of senior high school practical research teachers is shown in Table 2. As can be seen from the table, the participants rated themselves as very competent because they demonstrated the necessary skills for conducting research work. With the exception for statistical skills, the mean scores were all over 4.0, indicating high levels of research competence. The participants had the highest mean score in information skills, showing that these practical research teachers were confident in their ability to gather, examine, analyze, and interpret data in a way that would help them solve the research problem.

$1$ $\alpha$ $\beta$ $\alpha$ $\beta$	Table 2.	<b>Descriptive</b>	<b>Statistics</b>	for level	of research	competence
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<b>Research Competence Indicators</b>	Mean*	Std. Deviation	Skewness	Kurtosis
Information-Seeking	4.574	0.449	-1.154	0.857
Methodology Skills	4.132	0.64	-0.443	-0.659
Problem Solving	4.096	0.703	-0.435	-0.523
Communication Skills	4.189	0.724	-0.851	0.221
Statistical Skills	3.836	0.641	-0.482	-0.072
Over-all Research Competence	4.166	0.552	-0.587	-0.372

\*Legend: 4.2-5.0=Very High; 3.4-4.19=High; 2.6- 3.39=Moderate; 1.8-2.59=Low; 1.0-1.79=Very Low

Meanwhile, the participants had a moderate mean score in statistical capabilities, implying that senior high school practical research teachers are only moderately knowledgeable about mathematical formulas, models, and methodologies employed in statistical analysis of raw research data. In addition, the results suggest that the participants are highly skilled problem-solving, methodology, in and communication. The standard deviations computed for all scores show a narrow dispersion of participant answers across all measures. The kurtosis and skewness values were also so modest that none of them

exceeded 1.0, indicating that the data was normal.

# 3.3 Relationship between Institutional Research Culture and Research Competence

A test of relationship was conducted to examine the linear relationship between indicators of institutional research culture and the respondents' over-all research competence prior to multiple regressions analysis. All variables manifested linear relationship; however, significant association was only exhibited by working condition indicator.

Variable	<b>Over-all Research Competence</b>		
Working Conditions	0.312*		
Research Collaboration	0.107		
Research Infrastructure	-0.028		
Institutional Policy	-0.04		
Research Monitoring	-0.031		

Table 3. Correlations of institutional research culture and research competence

\*p <.05

# 3.4 Regression Analysis of Institutional Research Culture and Research

### Competence

Collinearity among the predictor variables was first established in order to meet the basic assumptions of linear regression. Research collaboration, infrastructure, and institutional policies yielded tolerance values close to zero and variance inflation factor (VIF) greater than 15 which indicated that multicollinearity possibly exist among them. Hence, only working conditions and research monitoring was included in the final regression model. The final regression model was found to be significant F (2, 64) =10. 37, <.001,  $R^2$ = .251, adjusted  $R^2$ = .227), however the total explained variance in the outcome variable is only accounted by up to 25% of the variance in the predictor variables.

Both working conditions and research monitoring were found to manifest significant main effects to research competence, thus they can significantly predict the latter (p <. 001). But looking closely at the results, working conditions show higher beta value than research monitoring suggesting better predictive power than the latter.

Table 4. Regression analysis between institutional research culture and research competence

Duckstow	(	Outcome Va	<b>Collinearity Statistics</b>		
Predictors	В	SE B	β	Tolerance	VIF
Working Conditions	0.587	0.129	0.745**	0.45	2.225
Research Monitoring	-0.353	0.099	-0.584**	0.45	2.225
**p <.001					

# 3.5. Discussion

This study emerged from the need for an indepth examination of factors that may influence the research competence of practical research teachers. Results revealed that among the indicators behind the development of a culture of research as identified by Hanover-Research (2014), participants' view that working conditions in the institution that they are employed in is a contributory factor in improving research competence and on increasing faculty research productivity. This means that the participants were highly satisfied with the seminars, workshops, and expert talks offered by their institutions. Also, the annual recognition of faculty that has shown exemplary research skills as well as the funding and seed money that they may gain influence them to be highly competent in conducting research. Moreover, research monitoring was perceived to be moderately implemented but has surfaced as a positive predictor of research competence. This is suggestive that research implementation management is indeed an important aspect in the research cycle. On the other hand, they perceive that the institutional policies and research collaboration in their respective institutions were reasonable but not of the same level compared to other indicators and that they do not significantly relate and predict the outcome variable. The data suggests that the senior high school practical research teachers observe that inter-disciplinary access of library, point-based evaluation system in assessing the quality of their research works, showcasing of their research outputs, as well as provision of exchange programs were adequately, if not substantially, provided by their institutions.

The findings support Social Cognitive Theory Lent et al (2015), which states that the interconnectedness between the given parameters, namely interests, values, and contextual circumstances, has an impact on one's career. The data contributes to a clearer understanding that the environmental factors provided by the institution influence the capability to develop competent research teachers. In addition to this, the results build on the theory's assumption that an encouraging and supportive environment will lead to a deeper interest rather than a limiting and restrictive environmental condition. These findings are also in accord with the Clemena and Acosta Model (2016) which suggested various indicators to assess the research cultures of institutions. Consequently, teachers are likely to delve deeper into research when they see themselves competently performing as a result of an encouraging and supportive environment.

While previous research focused on describing competence and factors that hinder

research productivity, the results in this study reveal the indicators which can significantly predict research competence and performance. The data indicates that practical research teachers possess the essential research skills necessary for the performance of research activities as identified by Meerah et al (2012). The senior high school teachers perceive themselves as very highly capable in the areas of information-seeking and highly capable in methodology, problem-solving, as well as communication. Albeit, they see themselves moderately capable in the area of statistical skills. These results build on the existing evidence postulated by Lent et al (2002) that individuals who believe that they are capable of managing their skills more effectively cause positive outcome expectations. As a result of perceiving themselves as self-efficient, capable, and competent, they would be able to perform well in the conduct of research, as postulated by Fouad (2014). The result of this part of the study agrees with Toqueros' (2020) previous study which implies that when teachers' competence towards research is high, themselves capable they see as of accomplishing it. This perception will eventually result to better student research outcomes which is the goal of all senior high school practical research teachers.

### 4. CONCLUSIONS

In conclusion, this study affirms that positive working condition is indeed an influential factor in promoting and developing teachers' research competence. The kind and type of support provided by school administration towards building a healthy research culture is proven to be a strong determinant of the trajectory of teachers' professional development towards creating a well-equipped teaching force ready to tackle research undertaking demanded by their profession. Therefore, school authorities should make an effort to further upgrade the various assistance and provisions they extend to their teachers particularly in promoting a positive and exhilarating research culture. Inevitably this will be expected to render significant positive effect on research competence and productivity.

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