Development and Validation of Research Culture Index in the Academe

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Abstract

This study has developed and validated an instrument that has assessed the research culture of different academic institutions. The validation is done through Delphi method and underwent reliability test using Cronbach Alpha, yielding high-reliability result of 0.8 for two trials. The validated Research Culture Index (RCI) analyzes the synergistic interaction of the different dimensions of research competency, research process and research productivity. There were 535 respondents which include the administrators, researchers, and faculty members from six State Universities and Colleges (SUCs) in Region X, who participated and validated the research instrument. The study revealed that among the three dimensions of the research culture index, research competency significantly influences the outcome of RCI in the academe as reflected by its high optimal weight. The three prime universities in Region X, namely, Mindanao State of Science and Technology, Bukidnon State University, and Central Mindanao University, have high research culture index. Demographic data further show that age has a significant bearing on dimension 1: research competency of the faculty, while the academic rank of the faculty has a significant effect on the two dimensions of research competency, and research process.

Keywords: *Research Culture Index (RCI), research competency, research process, research productivity, development and validation*

Rationale

Increasing research culture is one major priority the State Universities and Colleges have been addressing. Accrediting bodies and Executive order No. 80 series of 2012 (Performance-Based Incentive System) acknowledged the vital role of research in determining the SUCs leveling for quality assurance and quality improvements. Also, the Commission on Higher Education (CHED) explicitly identified SUCs to be the center of research and will serve as prime movers of the nation's socio-economic growth and sustainable development. However, this has challenged every institution especially in motivating faculty members to produce and publish quality research output that will advance the learning and ensure national development. This problem is more compounded by a lot of external elements that has affected the research culture of the faculty: common elements identified are the availability of funding, accessibility of institutional services and facilities, the presence of institutional support and guidance, and the existence of institutional research policies and agenda. Thus, the need to assess and evaluate the different interactions of elements affecting the research culture of HEIs is of high priority.

It is observed that Philippine HEIs have low research culture. This is evident in the study conducted by NEDA and World Bank observing that the Philippines has the lowest number of researchers per million populations which is comparatively low at 130 (National Economic

and Development Authority-Region X (2013). Moreover, the World Bank (2015) noted that the country has the lowest cumulative total of ISI publications among Asian countries (National Economic and Development Authority-Region X, 2013; Vinluan, 2012). The low productivity in the country is traced to the lack of local orientation of many research studies, funding, individual characteristics of researchers, lack of firm training from graduate studies, and the epistemic culture of knowledge production in the country (Vinluan, 2012; Salazar-Clemeña & Almonte-Acosta, 2007). Moreover, Salazar-Clemeña and Almonte-Acosta (2007) suggest that universities and colleges that are serious in transforming themselves into research institutions have to look at the elements of the research culture that contribute to research productivity, as viewed by the faculty members themselves (UNESCO, 2014).

In addition, wide arrays of literature were cited recognizing different factors affecting the development of research and institutional research culture. A high performing research environment needs a proactive and supportive research office, presence of performance indicators focused on research, clear policies on rewards and value given to research, assistance to grant applications and publications, existence of internal, unattached or open research funding, reduction of teaching and administrative workloads, presence of collegiality, networks and informal seminars or research method sessions, frequent communication and positive group atmosphere (Bland & Ruffin, 1992 in Pratt et al., 1999; Deem & Lucas, 2007; Dodgson, 2009; Hazelkorn, 2004; Jooton & McGhee, 2003; Pratt et al., 1999; Shamai & Kfir, 2002; Sibley, 1995; Tynan & Garbett, 2007). Also, Bland and Ruffin (as cited in Salazar-Clemeña & Almonte-Acosta, 2007) identified 12 factors present in high performing research environments. These are: clear goals for coordination, research emphasis, distinctive culture, positive group climate, decentralized organization, participative governance, frequent communication, resources (particularly human resources), group age, size and diversity, appropriate rewards, recruitment emphasis, and leadership with both research skill and management practice.

The preceding studies have considerable evidence on the effects of the different elements of the institutional research culture. However, no studies show the synergistic interaction among dimensions in determining research culture of State Universities and Colleges (SUCs). Furthermore, no studies have identified and computed the optimal weights per element and per dimension. Based on literature reviews, the identified gaps that need more exploration are the competencies of the faculty to conduct research regarding their knowledge, attitude, and values, the conduct of research process and support, and research productivity.

To address these gaps, a research culture index was developed and validated. The research culture index will help institutions understand the interactions of different elements that can affect the research culture of every organization, especially in SUCs. The index includes computing the optimal weights per indicators/dimensions and creating a range and qualifying statements that will describe the research culture in the academe. Furthermore, this study determined the different factors that may contribute to research productivity of the faculty and may affect the institutional research culture.

Objectives

The study aimed to develop and validate an instrument that assessed the research culture of an institution. Specifically, this study:

1. Developed a research culture index;
2. Evaluated the construct validity and reliability of the instrument;
3. Utilized the research culture index to the State Universities and Colleges in Region X; and
4. Determined the significant relationship between the individual attributes to the dimensions of the developed index.

Conceptual Framework

The study is anchored on the Salazar-Clemeña and Almonte-Acosta's Research Culture framework, derived from the CHED NHERA'S criteria, which are on research agenda,

guidelines, and policies on research incentives, facilities and services for research, publications, and faculty's capability for research.

Salazar-Clemeña and Almonte-Acosta's Research Culture framework (2009) assumed that attitudes and values concerning research within the institutional and organizational levels affect research productivity. They have defined research culture as the interaction between three domains, namely, the Trifocal functions, the Individual Attributes and Output, and the Institutional Attributes and Policies. Furthermore, they added that a double dynamism is involved in understanding the research culture of the institution. Specifically, the interaction between Domain 1 and Domain 2 implies the frame of meaning derived by the faculty members from their trifocal function. On the other hand, an interaction between Domain 2 and Domain 3 and Domain 1 and 3 implies the faculty members' view in the institutional policies and how this faculty assimilates their research function.

In application, research culture is, therefore, the result of the synergistic and complex interaction among dimensions, namely, research knowledge, attitude, and values, research process, conduct and support, and research productivity. Research culture appears as the ultimate product of different interactions. De Hock (1997) specified in modern concepts of management that interactions of the elements in an organization were found to obey multiple feedback loop systems rather than the traditional linear type of relationships. Therefore, research culture index can be expressed mathematically as:

Research Culture Index = Dimension 1 + Dimension 2 + Dimension 3

Where, Dimension 1: Research Competency, which includes the faculty knowledge, attitude, and values. This illustrates the faculty's ability to collaborate and brainstorm possible topics/ issues. This element could be of significance to one's specialization, express willingness to attend capability building for research, exhibits efficiency and time management, and recognizes the importance of conducting research for professional growth and development.

While, Dimension 2: Research Process, which includes the research conduct and support. This demonstrates the faculty's ability to present open-ended problems in one's discipline and is autonomous/independent in conducting research. It also includes the sustainability of the research activities through the presence of institutional policies, funding, linkage, and functional research unit that screens research output.

Lastly, Dimension 3: Research Productivity describes the combined effort of the institution and the faculty in increasing research output. Specifically, this encompasses the individual initiative to publish a research output in accredited journals and can utilize research output in teaching and service. Also, it includes the institution's roles in assisting and motivating faculty productivity by providing an avenue for publication and professional recognition through awards and incentives. Overall, these three domains represent the main components and processes needed by every institution in creating a positive research culture.

Figure 1 shows the state of interaction among the dimensions and over time, if the results of the interaction elevate the status of the system, then a positive research culture would be observed.

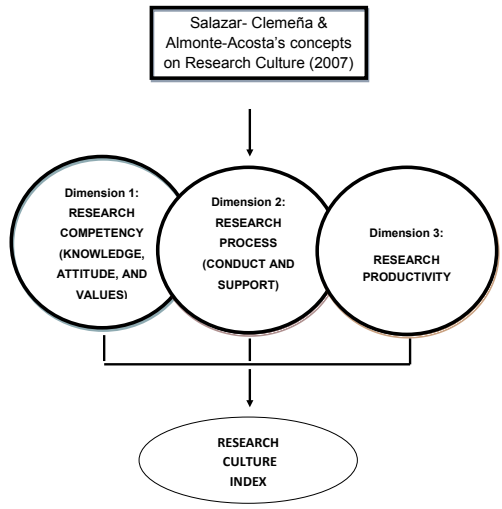

Figure 1: Research Culture Index Framework.

Research Design and Research Methods

The study utilized both qualitative and quantitative research approaches. Specifically, in the development of the research culture index, qualitative research approach was used. These approaches were utilized to formulate research culture indicators and processes using consensual Delphi method. In the validation of the questionnaire, quantitative research was used to compute for the weights and determine the relationship between the dimensions and the individual attributes.

There were two tryouts conducted with overall respondents of 535. The first tryout was divided into two phases: Phase 1 includes the pre-administration of developed questionnaire among 30 pilot respondents from Bukidnon State University. Phase II was the administration of the questionnaire after Delphi method. This phase was conducted among 481 faculty members of the six (6) State Universities and Colleges in Region X. Specific institutions include Bukidnon State University (BukSU); Camiguin Polytechnic State College (CPSC); Central Mindanao University (CMU); Misamis Oriental State College of Agriculture and Technology (MOSCAT); Mindanao University of Science and Technology (MUST); and Northwestern Mindanao State College of Science and Technology (NMSCST). Moreover, the second tryout was administered to at least twenty-four (24) researchers to include the research directors and identified researchers in the said SUCs.

Specifically, the try outs were conducted to determine the acceptance, revision or discarding of items following the concept of Nunally (1979), that, to increase the reliability of the index, the indicator with negative correlation was deleted. These reliability results were then reviewed and analyzed to formulate weights, scores and refinement of the index. Conversely, the second try-out was done to apply the instrument to six SUCs in Region X. This time, to avoid bias, an equal number of respondents, at least four researchers from the participating SUCs were identified to answer the questionnaire. Also, respondents' feedback and remarks were used to validate the developed scoring of the research culture index.

Instrument Procedure

An approach suggested by Streiner and Norman (1995) and adopted by Whiting et al. (2003) was utilized and modified in the development and validation of research culture index. The procedure involves the following stages:

1) Preliminary conceptual decisions include the conduct of literature review and studies in coming up with research culture dimensions. The key concepts identified were research knowledge, attitude, and values, research process, conduct, and support, and research productivity;

2) Item generation, this step has identified several indicators for each dimension based on literature review. Also, individual profile and attributes were evaluated to determine factors that can affect the faculty's research productivity and the research culture of the institution as a whole;

3) Consensual Delphi method includes the evaluation of the drafted questionnaire by the panel of experts. There were four experts tapped to evaluate the index questionnaire. These experts were from other higher education institutions and are active in conducting researches. Their comments and feedback were the bases for the revision of the questionnaire.

4). Try-outs for consistency and construct validity involve the administration of the drafted questionnaire to the identified respondents. The result of the first tryout was the basis for the determination of the optimal weights for each dimension. The following steps were followed as recommended by Padua (2014): First, equal weights were assumed, and the respondents were then asked to fill in the items of

the instruments. Second, the standard deviations of each item were computed to determine which ones are more variable, and assigned larger weights on those items which are more stable. As a measure of stability, the reciprocal of the computed standard deviations was considered. Therefore, the item weight is then equal to the stability measure divided by the total of the stability measures for all items

5) Generation of the refined instrument was done based on comments of the respondents and the reliability result

6) Application of the index tool, which was administered among identified researchers in the six SUCs

Results and Discussion

Development of Research Culture Index

The reviews from different literature and studies created significant statements that led to the formulation of the themes describing the research culture of an institution. The themes surfaced from the prior search as shown in Table 1 are knowledge, skills, attitude, process, conduct, support, and production.

Based on these themes, dimensions are formulated, and similar themes were identified and put together under common dimension. Using literature review, there were three summarized dimensions formulated: research conceptualization, research process, and research production. This process led to the formulation of the 19-item indicators that include eight indicators for research conceptualization, six indicators for research process and five items for research production.

Research conceptualization includes the knowledge, skills and attitude of the faculty to conduct research. Research process covers the whole procedure, processes, and support from the administration needed to create and finish

Table 1. *Significant Statements and Corresponding Formulated Meanings and Themes Emerging from Related Literature Search*

Theme	Formulated Meaning	Example	Study and Authors
Knowledge	Intellectual Capability	"holistic research thinking," creativity, communication competence	Deem and Lucas 2007 Hermanson 2008 Manathunga 2006 Kamler 2008
Skills	Writing competency	Collaboration, general research skills	Salazar- Clemeña & Almonte-Acosta's (2009), Deem and Lucas 2007
Attitude	Readiness Commitment	"On time submission". "Attendance "Handle teaching loads".	Salazar- Clemeña & Almonte-Acosta's (2009), Shamai and Kfir 2002 Brotherton 1998 Thomas and Harris 2000 Jooton and McGhee 2003
Process	Research system	Initiative, independence	Salazar- Clemeña & Almonte-Acosta's (2009)
Conduct	Application	"Research application".	Salazar- Clemeña & Almonte-Acosta's (2009)
Support	Available Resources	Research budget or funding, professional guidance, forum opportunities, research rewards/ incentives, Infrastructure, facilities, services, linkages	Shamai and Kfir 2002 DeHaven, Wilson, and O'Connor-Kettlestrings (1998) Salazar- Clemeña & Almonte-Acosta's (2009
Production	Productivity	Publications in accredited journals	Salazar- Clemeña & Almonte-Acosta's (2009), Hermanson 2008

research papers. Also, research production is the ability of the faculty and the institution to publish and apply the research papers.

The questionnaire underwent a series of validation through consensual Delphi among experts. The experts' inputs were considered by the researcher and constitute the phase of content validation. Table 2 shows the summary of comments and revisions made after the consensual Delphi method.

Table 2. *Summary of Experts' Comments and Revisions Made*

Item	Expert Comments	Revisions
Dimension 1: Research Conceptualization	It is suggested to change it to Research Knowledge, Skills, and Attitude to specify faculty's competency in conducting research	Dimension 1 was then revised to Research Knowledge, Skills and Attitude
Dimension 2: Research Process	It is suggested to include the conduct, and support.	Dimension 2 revised to Research process, conduct and support
Dimension 3: Production Stage	It is suggested to change it to Research Productivity	Dimension 3 revised to Research Productivity
	It is suggested to align the indicators to its specific dimensions	Indicators were aligned to the revised dimensions

Try out 1 Phase 1: Administration to Pilot Respondents

After revision of the developed questionnaire, it was then administered to pilot respondents from Bukidnon State University. Analysis of the items contained in the instrument revealed that all the items were understood by the pilot respondents since no items were left unanswered. This phase constituted the empirical aspect of reliability. A split-half method for determining the actual reliability index of the instrument was conducted, and results revealed a Spearman Brown Formula of 0.84 which is interpreted as highly reliable.

Other revisions include the change of percent of faculty conducting research from 40% to 20% which is the CHED's COD minimum requirement for research production among faculty members.

Try out 1 Phase II: Validation and Reliability Test of the Instrument for Research Culture Index

The refined questionnaire was then administered to a larger and varied population. Table 3 shows the result of the try-out. Tabular data revealed a high-reliability index, showing internal consistency. Furthermore, all items showed that most of the indicators are closely related to measure the three dimensions of the Research Culture Index (see Appendix Table 1).

Table 3. *Reliability Statistics of the Research Culture Index Questionnaire*

Cronbach alpha	Cronbach's Alpha Based on Standardized Items	No of Items
0.833	.827	19

However, item analysis of the research culture index revealed one negative item correlation and two items with low item correlation (see Appendix Table 1). Specifically, two of these items are found in Dimension 1, namely item no 2 with 0.281 item total correlation and no 3 with -0.011 item correlation; and item no 6 in Dimension 2 with 0.119 item correlation. These indicators were then removed as these items are vague statements and are not good indicators for the said dimensions. DeVaus (2004) suggested that anything less than 0.30 was a weak correlation for an item-analysis.

Furthermore, there were 16 items retained. These items show either moderate or high Cronbach Alpha item correlations. The data illustrate that the items were perceived by the respondents as good indicators to assess

Research Culture Index in the academe. Also, the try out results served as the basis for the revision of the questionnaire into its final form.

Formulation of Weights

The weights were then computed based on the idea that the item weight was equal to the stability measure divided by the total of the stability measures for all items. Specifically, this was computed by getting the standard deviation (SD) for each indicator. To calculate the stability of data, the reciprocal of SD (1/SD) was used.

Table 4 shows the summary of weights per dimension. Among the three dimensions, Dimension 1: Research knowledge, attitudes and values have the highest weight of 38%. The Dimension 1 greatly influences the outcome of research culture index in the academe. Based on the observations and interviews, Dimension 1 is the start of the most tedious and time-consuming facet as it entails a lot of processes like brainstorming, conceptualizing research topic, and doing a literature review. Considering that with dimension one (1) in place, the interaction of the rest of the elements will follow.

Table 4. *Summary of Weights per Dimension*

Dimension	Weight	Mean
Research knowledge, attitude, and values	*38%*	*0.0633*
Research process, conduct, and support	*32%*	*0.064*
Research Productivity	*30%*	*0.60*

However, it must be noted that the number of indicators in each dimension is not equal. Thus, the computed mean weight of each dimension would reveal which among the dimensions has an impact on the institutional research culture. Tabular data show a closely related mean among the three dimensions, indicating that synergistic relationship exists. However, the mean of Dimension 2 is slightly higher compared to the other dimensions. This suggests that Dimension 2 is crucial in completing the research process. No matter how much effort one invests on the first dimension, the need for financial support in the conduct of research is of utmost importance for research completion. Result culture is, therefore, the result of the synergistic interaction among the three dimensions.

Based on the computed weights, scoring and qualifying statements were developed and validated by the same panel of experts. The scoring and qualifying statements helped in interpreting and describing the Research Culture Index in the academe. Table 5 showed the range of scores and qualifying statements used in the study.

Table 5. *Range of Scores in Determining the Research Culture Index*

Research Culture Index	Description	Qualifying Statements
0 – 33%	Low	Less than 20% of the faculty has intellectual capability, writing competency & readiness commitment to conduct research; not able to sustain the conduct of research even with minimal institutional motivation & support; and has no publication in an accredited journal.
34% - 67%	Fair	At least 20% of the faculty has intellectual capability, writing competency & readiness commitment to conduct research; able to sustain the conduct of research with minimal to adequate institutional motivation & support; has limited publication in an accredited journal and research application.
68% - 100%	High	More than 20% of the faculty has intellectual capability, writing competency & readiness commitment to conduct research; able to sustain the conduct of research with minimal to adequate institutional motivation & support; has numerous publication in an accredited journal and has applied research output in respective fields.

Try out 2: Validation and Reliability Test of the Instrument for Research Culture Index

Table 6 revealed the second try out has a high-reliability result of 0.875. The result indicated that the index was understood by the respondents thus leading to the validity of each statement in each dimension. Among the 16 items answered by the respondents, all have above 0.30 item correlation, showing that the indicators have moderate to high item correlations in assessing the research culture.

Table 6. *Reliability Statistics of the Second Tryout*

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
0.875	0.874	16

Other revisions made after the second tryout include simplifying key dimensions. Dimension 1 on research knowledge, skills and attitude was then condensed to research competency. Also, Dimension 2 on the research process, conduct, and support, was simplified using the phrase "research process".

The result of the second tryout was the basis for the revision of the instrument to its final form. The refined instrument consists of three dimensions with 16 indicators. Specifically, Dimension1 has six indicators, Dimensions 2 and 3 have five indicators each.

Instrument Application

After developing and validating the instrument, the second tryout was done to confirm the scoring of the research culture index. The index was administered in the six SUCs in Region X. Table 7 showed the optimal weights per dimension and the overall Research Culture Index of the SUCs.

Table 7 shows the percentage score per dimension and the computed research culture index of the six (6) SUCs in Region X. Tabular values reveal that three prime universities in Region X have the highest research culture index among other SUCs in the region. These are Mindanao University of Science and Technology, Bukidnon State University, and Central Mindanao University, of which they scored above 80% in their research culture index. Based on the scoring range developed, these universities have excellent research knowledge, attitude and values, fast research process, exceptional institutional motivation and support, and high research output regarding publication in different journals.

Table 7. *Optimal Weights per Dimension and Research Culture Index of Six SUCs in Region X*

SUC IN REGION X	DIMENSION 1 (Research Competency) 38%	DIMENSION 2 (Research Process) 32%	DIMENSION 3 (Research Productivity) 30%	RESEARCH CULTURE INDEX
Bukidnon State University (BukSU);	33	28	22	83
Camiguin Polytechnic State College (CPSC)	9	16	6	31
Central Mindanao University (CMU)	32	28	21	81
Misamis Oriental State College of Agriculture and Technology (MOSCAT)	31	22	11	64
Mindanao University of Science and Technology (MUST)	32	30	23	85
Northwestern Mindanao State College of Science and Technology (NMSCST)	22	18	12	52

Moreover, it is noted that MUST, BukSU, and CMU have higher researcher productivity (Dimension 3). These institutions have strong linkages to assist their researchers in the publication of their paper. However, in other SUCs, the publications of research are prominently dependent on the researchers' initiative to publish in an accredited journal. Also, a low research culture of SUC is attributed to a fewer number of faculty conducting research and limited institutional support.

Furthermore, the result of the second try out validates the scoring range developed. Therefore, the tool is appropriate in determining the level of research culture of an academic institution.

Faculty Personal Attributes and Research Culture Dimensions

Figure 2 describes the scatter plot of the age of the faculty against the three dimensions of the research culture. As observed, the points are widely dispersed that no linear or curvilinear relationship exists. In general, this suggests that age is not a determinant factor in the research culture in the academe.

Table 8 shows the regression analysis of the three dimensions about the age, with a critical value set at 0.05 level. Figure 2 and Table 8 show similarity regarding the result of the age of the respondents.

Table 8. *Regression Analysis on Dimensions 1, 2 and 3 versus Age*

Dimension	P - Value	R-Squared (%)	Remarks
1- Research competency	0.001	2.5	Significant
2- Research process	0.237	0.31	Not significant
3- Research productivity	0.198	0.37	Not Significant

Critical value at 0.05 level

The analysis shows that age has no significant bearing on the research process and research productivity, but disagrees on the level of significance regarding research competency of faculty members. It is surmised that accumulation of experience with age leads to greater quantity and quality of research knowledge, attitude and values. The result implies that research culture is not a function of how old a faculty is in conducting research process and research output, but rather it is a function of how knowledgeable and committed a faculty is to do research.

Table 9 reveals the one-way ANOVA of Dimensions 1, 2 and 3 and its relationship to the gender of faculty members conducting research. A similar result revealed when gender was considered as a determinant of research culture. Expectedly, research culture is not a matter of a person's gender, but again,

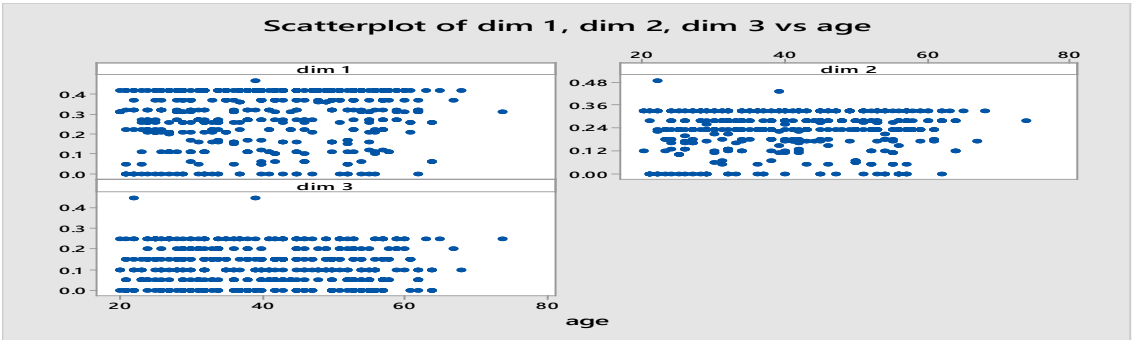

Figure 2. Scatter plot for the age of faculty versus dimension.

it is a function of a person's commitment to research which can be a product of the faculty's background and educational training.

Table 9. *One-way ANOVA of Dimensions 1, 2 and 3 versus Gender*

Dimension	P-value	Remarks
1- Research competency	0.714	Not Significant
2- Research process	0.668	Not Significant
3- Research productivity	0.626	Not Significant

Critical value at 0.05 level

Table 10 shows the analysis of variance between the academic ranks of the faculty and the three dimensions of the research culture index. Tabular data revealed that one's academic rank significantly affects the two dimensions of research culture index that is Dimensions 1: Research Competency, and Dimension 2: Research Process.

Table 10. *One-way ANOVA of the Three Dimensions versus Academic Rank*

Dimension	P-value	Remarks
1- Research competency	0.0001	Significant
2- Research process	0.003	Significant
3- Research productivity	0.072	Not Significant

Critical value at 0.05 level

However, there is no significant effect of academic rank to research productivity. The result means that the higher the ranks of the faculty, and the more knowledgeable and experienced are they in conducting research, have no bearing on the individual's ability to produce and publish research output. Since research productivity is one of the most often used indicators of research prowess, then, it can be surmised that the conduct of research is regardless of one's position but on the comprehension, readiness, and capacity of the faculty to sustain and produce research output.

To further determine which groups are significantly different regarding research knowledge and research process, post hoc test utilizing the Tukey test was performed. Table 10.1 and 10.2 show the comparison between the academic ranks and Dimension 1.

Table 10.1. *Tukey Pairwise Comparisons for Dimension 1*

Pairwise Comparison	P-value	Remarks
Assistant Professor vs. Instructor	0.999	Not significant
Associate Professor vs. Instructor	0.009	Significant
Professor vs. Instructor	0.000	Significant
Associate Professor vs. Assistant Professor	0.030	Significant
Professor vs. Assistant Professor	0.000	Significant
Professor vs. Associate Professor	0.368	Not Significant

Based on Table 10.1 faculty members whose academic ranks are Associate Professors are more knowledgeable and committed than those faculty members with ranks of Assistant Professor and Instructor. However, faculty with rank Professor are more knowledgeable than Assistant Professors but equally knowledgeable to Associate Professors. This result is explained by NBC461, stating that faculty members with instructor and assistant professor ranks are not expected to conduct research as they are only evaluated on their teaching effectiveness.

Table 10.2. *Tukey Pairwise Comparisons for Dimension 2*

Difference of Levels	P-value	Remarks
Assistant Professor vs. Instructor	0.988	Not significant
Associate Professor vs. Instructor	0.061	Not Significant
Professor vs. Instructor	0.028	Significant
Associate Professor vs. Assistant Professor	0.057	Not Significant
Professor vs. Assistant Professor	0.026	Significant
Professor vs. Associate Professor	0.915	Not Significant

On the other hand, Table 10.2 reveals that in the conduct of research, faculty with professorial rank has greater output compared to faculty in lower ranks. Moreover, it is deduced that faculty with higher ranks can sustain the conduct of research activities with the presence of institutional policies, funding,

and linkage. Also, it is believed that experience is one primary advantage a faculty has in creating and conducting a research study.

The above figures corroborate with the National Budget Circular (NBC) 461 stating that faculty with professorial ranks is expected to contribute to the stock of human knowledge by publishing research output under their particular field of expertise. It is assumed that associate professor faculty conducts research to seek promotion since research is one important area that is evaluated.

Findings

1. Validation of research culture index in the academe is measured by determining a faculty's research competency, research process, and research productivity.
2. Among the three dimensions of research culture index, Dimension 1 (on Research Competency) has the highest optimal weight which shows that Dimension 1 greatly influences the outcome of research culture index in the academe.
3. Research culture index of the academe can be described as low, fair and high in terms of research competency, research process, and research output.
4. Three prime universities in Region X, namely, Mindanao State of Science and Technology, Bukidnon State University and Central Mindanao University have high research culture index.
5. Age has a significant bearing on the research competency of the faculty. The academic rank of the faculty has an important effect on the two dimensions, Dimension 1 which is research competency, and Dimension 2 which is Research Process.

Conclusion

The following conclusions were generated based on the findings of the study:

1. Research culture index in the academe can be developed and validated.
2. Computation of the optimal weights can give a clear picture as to which dimension can significantly affect and determine the research culture index in the academe.
3. The faculty's competencies greatly affect the outcome of the institution's research culture.
4. Identifying research culture index description and qualifying statements can describe the research culture of an academe.
5. Personal attributes such as age and academic rank affect the research competency, and the research process of the research culture index of an institution.

Recommendations

The outcome of this study led to the formulation of the following recommendations:

a) The Commission on Higher Education is encouraged to use the developed index to assess the Research Culture of HEIs in the Philippines;

b). The developed Research Culture Index is commended to all school administrators and research directors to determine their institutional research culture and institutional strength and weaknesses according to the RCI dimensions.

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Appendix Table 1. *Item Analysis of Reaserach Culture Index for 1st Tryout*

Item-Total Statistics

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
VAR00001	12.5000	14.534	.499	.824
VAR00002	12.5000	14.948	.281	.830
VAR00003	12.5333	15.499	-.011	.841
VAR00004	12.6000	14.455	.335	.828
VAR00005	12.5333	14.671	.342	.828
VAR00006	12.8000	13.890	.393	.826
VAR00007	12.9333	14.133	.307	.832
VAR00008	12.9000	13.679	.434	.824
VAR00009	12.8000	12.855	.702	.808
VAR00010	13.0000	12.966	.646	.811
VAR00011	12.5333	14.189	.558	.820
VAR00012	12.6000	14.455	.335	.828
VAR00013	12.6000	14.455	.335	.828
VAR00014	12.4667	15.361	.119	.834
VAR00015	13.0000	13.793	.405	.826
VAR00016	13.0667	13.306	.564	.816
VAR00017	12.6333	13.895	.496	.821
VAR00018	12.9667	13.344	.530	.818
VAR00019	12.8333	13.454	.509	.820

Appendix Table 2. *Item Analysis of Reaserach Culture Index for 2nd Tryout Item-Total Statistics*

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
VAR00001	10.1511	16.593	.351	.877
VAR00002	10.1583	15.859	.491	.869
VAR00003	10.1583	15.569	.591	.865
VAR00004	10.3094	14.882	.661	.861
VAR00005	10.3741	15.018	.593	.864
VAR00006	10.3094	14.824	.678	.860
VAR00007	10.2302	15.179	.632	.863
VAR00008	10.4460	15.089	.559	.866
VAR00009	10.0504	16.599	.401	.873
VAR00010	10.2302	16.193	.323	.876
VAR00011	10.2014	16.003	.400	.872
VAR00012	10.5612	15.407	.479	.869
VAR00013	10.5180	15.237	.519	.868
VAR00014	10.2302	15.686	.475	.869
VAR00015	10.4676	14.990	.585	.864
VAR00016	10.2806	15.218	.580	.865

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