

Motivating Factors and Challenges of Faculty Members in a State University in the Philippines in Publishing Journal Articles

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ABSTRACT

This study determined the research performance of the faculty members of a state university in the Philippines, their motivation in research and determinants of publishing in academic journals. It used QUANqual mixed methods, particularly, descriptive statistics, factor analysis and logistic regression on survey data and narratives from in-depth interviews. On average, a faculty member is involved in seven research studies and has published one journal research article. Around one-third of them were unaware of the publication policies, while 40% think these policies are only being partially implemented. Faculty respondents were moderately motivated to publish journal articles. Top faculty motivations for publishing are faculty promotion and the importance of disseminating findings. Perceived very serious challenges in research conduct were resource limitations and unclear research-related policies. Educational attainment, Science and Technology accreditation, intrinsic motivation and motivation to mentor to sustain research culture were significant determinants for a faculty to publish. The interview narratives powerfully support these quantitative results.

Keywords: Research productivity metrics, Journal publication rate, Motivation to publish, Faculty researcher determinants, Publishing journal articles.

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INTRODUCTION

Research productivity and influence have become globally important metrics when evaluating higher education institutions and academic programs. For example, in the Times Higher Education's university evaluation criteria, 30% of the total weight is for the quantity, returns and reputation from research and another 30% is for citations reflecting research influence.^[1] For QS World University Rankings, "institutional research quality" measured by the metric citations per faculty comprises 20% of the total score. This metric is computed by looking at the ratio of all the citations of all the publications of a university and the total faculty members.^[2] In the QS Asia University Rankings, the metrics are slightly modified to cover research collaboration (10%), citations (10%) and publication productivity per faculty (10%). Similarly, the Academic Ranking of World Universities (ARWU) puts 40% weight on publications in top-tier journals

such as those indexed in SCIE and SSCI. Research engagement, productivity and influence are defining criteria for a university.

In the Philippines, the impact of university research on society and the productivity of faculty researchers are being emphasized when evaluating academic institutions. The publication metrics in terms of number of publications of faculty members is an indicator being evaluated along with the number of established research centers and externally generated research funds, inventions and innovations. The Commission on Higher Education (CHED) also allocates a budget for providing competition-driven grants-in-aid programs for research and innovation. The accreditation bodies and consortia have research as one area. Research productivity is also an important metric in faculty promotion, especially for the professorial level.

On research publications, academic journal publications rank higher in terms of prestige than other types of publication.^[3] Publishing journal articles is one way to broadly disseminate research results, which is the final step in the research process. Publishing research in journals provides benefits such as allowing your work to be discovered, contributing to the permanent records of research in your specific field and providing information for impact.^[4] The rigorous process of blind peer review in the journal



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publication system serves to control the quality of published papers.^[5] Faculty members in universities are expected to publish in scholarly journals and have their research works cited as a measure of research impact.

However, the Philippines is behind Vietnam, Thailand, Malaysia and Singapore in the metrics of journal publication and article citations.^[6] Their bibliometric method carried out using Elsevier's SciVal 2020 data showed that the total number of scholarly outputs in the Philippines is 5,291 compared to these five countries having publications ranging from around 12000 to 45000. Similarly, in the field of education and psychology, the Philippines ranked low in research productivity compared to Singapore, Thailand and Malaysia, particularly starting in the 1990s.^[7] In many universities, while many are doing research, only a few are publishing in scientific journals and the same people are motivated to publish. Philippine universities need to improve their research productivity.

One problem among research agencies and SUCs in the Philippines is that many research outputs only end up being presented in Annual In-House Reviews or conferences and are not published. CHED data shows that the number of faculty researchers, defined as those with publications, patents, utility models and awards, is still below the ideal for the SUC leveling.^[8] Full teaching load and other faculty responsibilities are the more apparent constraints. But many faculty members still engage in research and publish given the same predicaments. Furthermore, most of the fundamental incentives appear to be in place in most universities, such as Equivalent Teaching Loads (ETLs), publication incentives, support for paper presentations and others. Therefore, a better understanding and rigorous analysis based on actual data from faculty members is necessary to be able to put forward more realistic policy recommendations.

This study takes the case of one state university in the Cordillera region to understand the perceived motivational and experiential factors that push faculty members to conduct research and go to the extent of publishing their results. It also tackled the challenges encountered by the respondents in conducting research activities and publishing research outputs. Lastly, it elicits the perceptions of the respondents on increasing the number of publications of university researchers. Findings from this study and corresponding recommendations will be useful in supporting, reinforcing and possibly proposing recommendations to increase the number of faculty researchers. Specifically, it 1) determined the status of faculty research engagement and publication; 2) explored the research-related motivations of faculty members; 3) determined the challenges of faculty members in doing research and publishing their research in scientific journals; and 4) analyzed what factors explain the publication productivity of a faculty.

Research performance as a higher education evaluation metrics

There are many ways of defining and looking at the research performance of a university and individually. On one hand, university ranking bodies and bibliometricians look at quantity indicators to measure productivity and impact and or other variants like the number of international research collaborations, h-index, etc.^[1,2,8] On the other hand, one author look at research as a production process and hence output per unit should be the criterion to measure.^[9] This concept implies that institutions with a lower budget are expected to produce less than those with higher budget allocations. This study takes the former concept of research productivity, which is the more common approach and the approach taken by CHED. Research quality and productivity are important measures used to evaluate tertiary degree program quality during accreditation and University performance in general.

For faculty members and even for Science and Technology (S&T) workers, high-quality research engagements and research productivity are the source of researchers' prestige, recognition, career progression and other benefits. The Philippine system of faculty promotion does not put limits on the area of research. While research publication is not a condition for being tenured or permanently employed in the case of state universities in the country, it is a major basis for promotion to full professorship.

Notwithstanding, at this case state university, only a few faculty members engage in research and go to the extent of publishing their research outputs in scientific journals. Thus, there is a need to identify underlying factors that could be used to explain such a phenomenon. One aspect to consider is the faculty profile in terms of educational status, previous research activities and exposure to researchers among others. Another aspect to consider is the motivation of researchers to engage in research and publish research articles. In general, analysis of motivation is an aspect of human behavior in organizations under the broader field of management science. Employee motivation theories include the Needs motivation theory,^[10] Equity theory^[11] and 3) Herzberg's motivation theory,^[12] and 4) Expectancy theory of motivation,^[13] and 5) Job characteristics model.^[14] These theories are also possibly applicable in the case of motivation among employees in an organization in general. However, in conducting research, there may be more specific motivation and demotivation factors particular to research productivity and publication.

DESIGN AND METHODS

The study was conducted in one state university in the Cordillera Administrative Region from January 2019 to December 2020. A QUAN+qual mixed method approach was used combining quantitative core component and qualitative supplementary component.^[15] Descriptive quantitative methods were used to discuss the research performance and respondents' extent of

motivation in conducting research, mentoring and publication; and the degree of seriousness of the respondents' challenges in publishing. Regression models were used to identify the determinants of publication productivity. The qualitative part which used in-depth interviews was used to validate and explain the quantitative results and to explain further the interplay of variables.

Specifically, for the quantitative part, the study used a researcher-developed questionnaire based on literature, brainstorming sessions with selected faculty members and researchers and policies and memorandum related to research and extension retrieved from the Records Office and policies reviewed from the Research and Extension Manual of Operations of the university. It included the following information: respondent's profile, research outputs, research, publication and mentoring experiences; extent of motivation and challenges in conducting research, mentoring and publication; and proposed and suggested policies. Pre-testing of the survey questionnaire was done prior to data gathering to ensure the instrument's internal consistency. Based on the analysis, the instrument was reliable with a Cronbach coefficient greater than 0.70.

Questionnaires were given to all faculty members through the Department heads and self-administered. Participants were given up to two weeks to accomplish the questionnaire. Most of the questionnaires were not completed after the planned timeline; thus, respondents were reminded and follow-up collection was done. Ethical considerations such as respondents' right to informed consent and right not to participate were properly observed. This proposal was approved by the university Research and Extension Evaluation Committee (REEC) with criteria on ethics and registered under the Institute of Social Research and Development. The survey was conducted from March 2019 to March 2020. Overall, the retrieval rate was 35%.

On the profile of the faculty respondents, most of the respondents are instructors (46%), followed by assistant professors (23%), associate professors (18%) and professors (13%). This breakdown is comparable to the percent distribution of the total number of faculty members in the university, which indicates that the survey responders represent the faculty members in terms of faculty rank. A third of the respondents taught at the university for 8 years or less and around a third were in service between 8 to 16 years. This distribution indicates that respondents with long and short teaching experience at the university were represented. Moreover, only 1% of the respondents have not graduated with any Master's or Ph.D. degree, suggesting that almost all the respondents completed a thesis or dissertation. Some respondents (20%) worked as research assistants before becoming faculty members; 22% are DOST-certified S&T personnel and 20% graduated with their Ph.D. by research.

For the qualitative part, in-depth interviews were conducted with six participants who were included based on: the number of journal publications, number of registered researches, faculty researchers with awards, or experience as research assistants.

Descriptive statistics such as frequency and percentage distribution of respondents and means were used to answer the first four objectives. Exploratory factor analysis was also done to summarize and derive the common themes or factors for the motivation and challenges. Various models were explored and used to analyze the factors influencing research engagement and research productivity. The logistic regression analysis was finally used to analyze the determinants of the research engagement and productivity in terms of the faculty number of published research articles. Results from the factor analysis were used as potential explanatory variables for the research and publishing dependent variables. Table 1 presents the final model specifications and variable definitions. Analysis was done using SPSS v.25.

RESULTS AND DISCUSSION

Number of Research Journal Publications of Faculty Researchers

The mean number of research articles published in a research journal by the faculty members as of 2018 is 1.46 (Table 2). Notably, faculty members in the Colleges of Arts and Sciences, Agriculture and Forestry have the highest mean number of research articles published per faculty member at 3.53, 3.50 and 2.13, respectively. Colleges of Engineering, Home Economics and Technology, Nursing and Information Technology faculty members published around one article per faculty member on average. The College of Teacher Education (CTE) has the lowest number of journal publications at 0.44. A CTE faculty explained that this result could be because the roster includes the high school and elementary laboratory school teachers, most of who are not involved in research. Dividing this number of published journal articles by seven, which is the average number of studies conducted by a faculty member,^[16] roughly shows a publication rate of 21%. These results imply that many completed research studies have not been published or some studies are not publishable in itself.

Faculty researchers publish in journals indexed in Scopus or Web of Science, university journals and college-based journals. College of Arts and Sciences tops all other colleges in the mean number of articles published in the university's research journal. The College of Forestry is highest in terms of the average number of Scopus-indexed published articles. In 1987, public universities in the Philippines had less than one publication per institution, with the NCR, Region I, Region V and Region VI having more than one average number of publications per university.^[17] The number of publications improved from 2009 to 2015.^[18] In 2009, the number of publications was 1,196 and after six years, the number of publications rose to 2,014 (College of Science

Library- A. Villafior). The increase rate is around 136 plus or minus 66.43 publications per year. The percentage increase in 2015 publications from 2009 is 68.4%. Dividing the figure into 2015 SCOPUS publications by the number of tertiary schools in the country, which is 1,943 (Academic Year 2016-2017), a rough estimate of 1.04 publications per institution per year may be assumed. Therefore, at the institutional level, it appears that this case university is a little above but around average.

Motivation of Respondents in Engaging in Research, Mentoring and Publication

The faculty respondents were asked about their level of motivation in conducting research, mentoring other researchers and publishing in research journals by indicating their level of agreement with the various reason statements in the questionnaire (4 is very much motivated and 1 not motivated). Overall, respondents were moderately motivated to conduct research (mean=2.97), mentor other researchers (mean 2.77) and publish in research journals (mean 3.10)

On the motivation to conduct research, the factor analysis of the survey responses resulted in three motivating factors, namely: self-enhancement and intrinsic motivation factors, rewards and performance goals and compliance with requirements (Table 3). Under the intrinsic motivation factor, the top four reasons for

doing research are enriching knowledge through research, being updated with the current disciplinary trends, discovering new things, information, or products and the excitement that discovery brings. Intrinsic motivation is the individual's satisfaction or activities done "for their own sake," or for their inherent interest and enjoyment.^[19] One seasoned researcher, who has already reached full professorship corroborated this result when she mentioned that research is a matter of passion and the desire to serve people such as the farmers. "I feel incomplete when I do not do research", she underscored. A study covering 11 Philippine public-school teachers similarly mentioned that while teachers' motivations in doing research were more personal rather than professional, they recognize the benefits of doing school- and classroom-based research for their teaching practices and career development.^[20]

Another factor motivating faculty members to engage in research is external motivation, including rewards, incentives and performance goals. The opportunity to participate in conferences and travel outside Benguet and the Philippines are top-ranked reasons under this theme. The other factors, such as monetary incentive, research ETL and opportunity to vie for awards, were judged by faculty respondents as moderately motivating. Finally, compliance with requirements is another factor that is moderately motivating faculty respondents to do research. The top reason

Table 1: Descriptions of final variables included in the logistic regression model.

Variable	Descriptions
<i>Dependent variables</i>	
PubRes	Value 1 if respondent has journal publication, 0 otherwise.
<i>Independent variables</i>	
EDUC	Educational attainment.
INTPUB	Number of international publications.
COPY	Number of copyrights/UM/Patent.
DOST	Value 1 if respondent is a DOST-accredited S&T researcher, 0 otherwise.
RA	Value 1 if respondent has experience working as research assistant prior to being faculty, 0 otherwise.
PHDRES	Value 1 if respondent has Ph.D. by research, 0 otherwise.
ACTIVE	Value 1 if respondent has at least one research study conducted, 0 otherwise.
MENTORING	Value 1 if respondent has mentored at least one researcher, 0 otherwise.
NoRes	No. of researches conducted.
MOT_A, MOT_B, MOT_C	Motivation for research engagement factors A (Intrinsic motivation), B (Rewards), C (Requirement).
MOTMEN_A	Motivation factor A in mentoring.
MOTPUB	Motivation factor on publication.
CHALA, C, E	Challenges in research engagement factor A.

for faculty respondents under this theme is that research is a requirement for promotion and is needed in academic program accreditation. Research is one of the ten criteria used in assessing programs by accrediting agencies.^[21] Accordingly, some areas being looked at by accreditors under research area are research being used to improve learning competencies and knowledge of students, faculty competency in research and department-relevant research and specialized researchers.

From the in-depth interviews, researchers Jade and Jona added that by doing research, examples are drawn from field works and research outputs and shared or taught to students. In other words, it contributes to curricular development which will lift one's field expertise, the students and the University as a whole. Besides, the research results shared by a faculty researcher strengthen the credibility of that faculty to their students. Researcher Brenda also expressed that her training as a research assistant contributed to developing her passion for research. Together with her mentors and colleagues, she continued the preparation of research proposals which sustained her regular projects

On the motivation to mentor young researchers, two motivational factors derived from the factor analysis were: self-fulfillment (mean=3.02, MoM) and sustaining a research culture at the university (mean=2.52, MoM) (Table 4). All factors were rated moderately motivating with the statements such as "I feel good when my mentee is doing good in research", "It is an achievement to be able to mentor other faculty members" and "It gives me pleasure to be able to help other faculty members" getting the top three rank. They are minimally motivated to mentor young faculty members by the pressure of retirement or the obligation of holding professor rank. On the other hand, matters related to role modeling, paying forward, a sense of personal satisfaction brought by mentoring and increased research productivity is observed to moderately motivate faculty members to mentor.

One paper pointed out the importance of the passion of mentors to train younger researchers toward developing a research culture in the organization.^[22]

Finally, on the faculty members' perceived factors that motivate them to publish in journals, the statement "it is required for promotion" was rated as a very much motivating factor (Table 5). The latest guidelines on the promotion of SUC faculty members in the Philippines acknowledge the value of research productivity in terms of scholarly research published in "journals listed in international indexing bodies such as Web of Science, Scopus, ASEAN Citation Index (ACI) and other journals of a sterling reputation."^[23] Publication in international journals falls under this requirement. Furthermore, for a faculty to become a professor, qualitative contributions are required, 50% of which are in the area of research. In the case of Taiwan faculty members, the level of reward in terms of promotion affects also the level of motivation to publish or the greater the reward in terms of position, the more highly motivated the faculty member.^[24]

This result is validated by one of the more published faculty members at the university who said: "Some faculty members are being dragged to publish. I say dragged because they only do that for promotion since one of the requirements to become a professor is to publish at least one article in the ISI/Scopus-indexed or Commission of Higher Education (CHED)-accredited journal." However, he mentioned that one disadvantage of having promotion as the only motivation for publishing is that after becoming a professor, nothing follows.

Another factor that highly motivates the faculty respondents to publish research articles is that they consider it important to be able to publish their findings. Publication, particularly in indexed international journals, provides the opportunity to disseminate research results to the scientific community. The

Table 2: Mean number of journal publications per faculty member of the case university, by college, by journal type, 2019.

College	College-based Journals	University Research Journal	Local University Journals	ISI/Scopus-Indexed Journals	All types of Journals
College of Agriculture	2.00	2.50	1.67	2.33	2.13
College of Arts and Sciences	3.50	2.80	3.33	4.50	3.53
College of Engineering and Applied Technology	1.00				1.00
College of Forestry		1.00		6.00	3.50
College of Home Economics and Technology			1.00		1.00
College of Nursing		1.33	1.00	1.50	0.96
College of Teacher Education	0.78	0.22	0.38	0.40	0.44
College of Veterinary Medicine			1.00	1.00	1.00
Institute of Information Technology				1.00	1.00
Institute of Public Administration					
All	1.60	1.45	1.10	1.67	1.46

Table 3: Extent of motivation of respondents in engaging in research.

Motivations	Mean	D.E.	Rank
Self-Enhancement/Intrinsic Motivation/Mastery Goals			
I enjoy doing research.	3.00	MoM	8.5
It excites me to discover new knowledge/information.	3.27	VMM	4
To be a role model for younger/new faculty members.	2.85	MoM	11
It gives me work variety (break from teaching).	3.05	MoM	6
It gives me an opportunity to express myself.	3.00	MoM	8.5
Research gives meaning/significance to my life.	2.97	MoM	10
To discover new things/ information/products.	3.29	VMM	3
I need to enrich my knowledge through research.	3.36	VMM	1
It keeps me updated with the current trends in my field of expertise.	3.34	VMM	2
It provides me evidence-based information for decision-making	3.25	VMM	5
I conduct research in order to establish linkages.	3.03	MoM	7
Overall mean	3.13	MoM	
Rewards/Extrinsic Motivation/Performance Goals			
There is paid equivalent teaching load (ETL).	2.78	MoM	4
It has monetary incentive.	2.81	MoM	3
It gives me opportunity to travel outside Benguet/Philippines.	2.97	MoM	2
I can vie for awards and can be recognized	2.71	MoM	5
It gives me opportunity to participate in conferences and other research-related activities.	3.14	MoM	1
Overall mean	2.89	MoM	
Compliance to Requirement			
It is required by the university for my position (e.g. professor)	2.91	MoM	3
It is needed for our department/academic program accreditation.	3.06	MoM	2
I am the only one who is not conducting research in the Department.	2.23	MiM	4
It is a requirement for promotion/NBC.	3.20	MoM	1
Overall mean	2.89	MoM	

3.25 – 4.00 Very Much Motivated (VMM); 2.50 – 3.24 Moderately Motivated (MoM); 1.80 – 2.49 Minimally Motivated (MiM); 1.00 – 1.79 Not Motivated (NM).

peer-review process in journal publication validates the scientific merit, validity and relevance of the articles and its methodology and relevance,^[25] which gives the author more confidence in published, rather than unpublished research outputs.

This result is validated by the in-depth interviews where they mentioned that publishing in journal articles allows your findings to be read and cited by the scientific community. Rosendo, one researcher mentioned that with the disseminated research, he started being tapped as a referee and resource speaker in international publications and conferences where he shares his experiences and insights on how to be more productive for publication. This he said, “boils down to my love of science and interest to be part of the pool of expert and scientist from my field”.

All the other factors, including monetary incentives, fulfillment and pleasure and enhancing technical writing skills, were

perceived as moderately motivating by the faculty respondents. Specifically, the statement “it gives me fulfillment to publish my research” is also moderately motivating but ranked lowest among the reasons for publishing research articles. In contrast, in an in-depth interview with the most-published faculty member in the university mentioned the following statements:

“I feel an urge to publish because after publishing a paper, it feels good. It is like wow! I published something, so what is next? Once I see my name on the internet, receiving email that my paper has been accepted, it feels good. So, I want to have that feeling all over again. I feel excited, all of those tiresome times, all of those stressful moments, if you’ve completed a publication, you feel like you achieved your goal.”

Previous studies also point to intrinsic motivation such as personal fulfillment as positively correlated with research productivity.^[26-28] Based on a study covering 14 universities and

colleges in the Philippines, which elicited faculty perceptions on factors necessary for improving research productivity, one identified factor was a strong belief in the research endeavor.^[29] They concluded that to develop a research culture in a university setting, the dynamics of the interaction of three factors, namely the trifocal function of HEIs, the researchers' mind and the body of institutional policy, are important.

Challenges in Conducting Research and Publishing

When asked to rate the degree of seriousness of the pre-identified challenges in conducting research, most items were rated to be moderately serious (Table 6). Two clusters of factors rated to be very serious are those related to faculty resource limitation and unclear research-related policies. For the resource limitation, the top rank issue is "too much non-teaching related requirements in the university," which implies that they have no time to conduct research. Related to this and also rated as very serious challenges are the time lags between submission and approval of proposals and between submission to publication of research articles were rated very serious challenges. Similarly, in one study of 173 faculty members in three higher education institutions in the Philippines, they identified comparable factors that prevent faculty members from publishing research articles, namely: limited time, lack of training, fear of rejection and lack of institutional support.^[30] Also, a study in Southern Philippines found that lack of deloading scheme and heavy workload were factors to the low number of researches among selected HEIs in

Region X, Philippines.^[31] Furthermore, lack of time was found to be an obstacle to research.^[29] They recommend that strategies for addressing time problems must therefore be planned and evaluated. One study also found that as the number of hours spent on research increases, the number of articles published also increases.^[28]

For the factor on unclear policies, concerns on "doing research requires time and effort; it should be given an ETL of 6 units", "Benchmarking should be open to all researchers not only those who hold administrative functions" and "The time in and out of faculty researchers during the lunch break must be suspended especially for those who conduct studies outside the University" were rated "very serious" by the respondents. Based on the university's Research and Extension Manual of Operations (REMO), the current ETL for a research study is three units and the maximum number of units a faculty member can claim for research ETL is six units. The statement on some policies in conducting research, such as ETL being unclear and not being implemented, was also rated to be a very serious challenge.

In relation to the concern that benchmarking should be open to other faculty members aside from those administratively designated, one faculty member schooled abroad remarked that:

"There is a need for faculty members to get out of their comfort zone. As much as possible, they should study abroad in a school where there is a publication culture. That's the only way to

Table 4: Extent of motivation of respondents in engaging in mentoring.

Motivations	Mean	D.E.	Rank
Sustaining a Research Culture at the university			
I will be retiring soon.	1.88	MiM	5
Junior faculty need mentoring.	2.72	MoM	3
I was mentored before by senior researchers and should pay forward.	2.76	MoM	2
It is the only way to sustain the efforts of my Department on research and extension.	2.83	MoM	1
I am a professor, and I am obliged to mentor younger faculty.	2.11	MiM	4
Overall mean	2.52	MoM	
Self-Fulfillment			
I enjoy being able to mentor others.	3.04	MoM	4
It gives me pleasure to be able to help other faculty members.	3.10	MoM	3
I feel good when my mentee is doing good in research.	3.23	MoM	1
It is an achievement to be able to mentor other faculty members.	3.13	MoM	2
Mentoring gives me a chance to do more research in a year.	2.84	MoM	6
I want to become a role model for younger faculty members.	2.69	MoM	8
It is a break from teaching.	2.87	MoM	5
Mentoring gives me a chance to do research without being stressed so much.	2.81	MoM	7
Overall mean	3.02	MoM	

3.25 – 4.00 Very Much Motivated (VMM); 2.50 – 3.24 Moderately Motivated (MoM); 1.80 – 2.49 Minimally Motivated (MiM); 1.00 – 1.79 Not Motivated (NM).

Table 5: Extent of motivation of respondents in engaging in publication.

Motivations	MEAN	D.E.	RANK
It is a requirement for promotion.	3.29	VMM	1
It is important to me that I am able to publish my findings.	3.27	VMM	2
Of the monetary incentives given.	3.14	MoM	3
It gives me fulfillment to be able to produce a technology or patent/copyright.	3.05	MoM	4
It gives me pleasure to be able to publish a research article.	3.00	MoM	5
I want to share my research outputs with the world/community.	3.00	MoM	6
I want to enhance my skills in technical writing.	2.97	MoM	7
It gives me fulfillment to be able to publish my research.	2.85	MoM	8

3.25 – 4.00 Very Much Motivated (VMM); 2.50 – 3.24 Moderately Motivated (MoM); 1.80 – 2.49 Minimally Motivated (MiM); 1.00 – 1.79 Not Motivated (NM).

motivate them...They need to know what is in the international level.”

The above opinion is similar to a result of a study done in ten Cambodian universities, where it detected that “faculty obtaining their terminal degrees abroad were more likely to engage in research activities”.^[32]

On issues related to monetary incentives, the statement that “incentives are not given real-time” or “are not given immediately” were rated as very serious challenge. For example, in the case of publication incentives, it is usually given at the end of the year if the remaining budget allows. In the case of incentives for awards, there is a processing time and for some awards, it has to be requested. According to CHED’s NHERA, one indicator of an institution having a research culture is evident in the policies and guidelines on research incentives, including financial and non-financial rewards (e.g., professional recognition) for research.^[29]

These quantitative results were corroborated by the narrative accounts of challenges in research and publication and perceived solutions based on in-depth interviews with faculty members. Themes defined from the narratives include: disappointments with research and publication evaluators, difficulty in writing, unimplemented or delayed implementation of research incentives for faculty researchers, limited research monitoring, limited resources for university-funded research and different research interests and expertise. Furthermore, derived themes on faculty perceptions to increase research engagement and productivity are: encourage faculty members to study abroad, provide an environment where a faculty member is free to think and create, organize a recognition program for faculty members who are publishing and improve ICT facilities and access to international paid journals, monitor regularly papers of faculty members and increase support for the research sector by the administration.

Determinants of Faculty Members Publishing in Scientific Journals

Table 7 presents the results of the logistic regression model with a latent variable taking the value of 1 if a respondent has at least one publication in peer-reviewed journal and 0 for no publication. The model was found significant with significance value of less than 0.05. The logistic model is relevant considering that only one publication is required for a faculty member to attain a full professor rank. Based on the results, DOST S&T accredited faculty, intrinsic motivation and motivation to mentor to maintain research culture at the university were significant predictors of a published faculty or faculty having at least one publication. Specifically, a DOST S&T accredited faculty are five times more likely to publish than non-accredited faculty members. Science and Technology (S&T) accreditation is a system under the Department of Science and Technology (DOST) giving certification of eligibility for non-DOST S&T personnel who are involved in scientific and technological activities. The qualification requirements for such personnel are: 1) the agency where the S&T personnel is employed must be actively doing any or all of the S&T activities such as R&D, scientific and technological services and scientific and technical education and training; 2) the applicant must be an S&T personnel holding an S&T position as defined in the guidelines; and 3) the applicant must hold a STEM degree or courses listed under the Scientific Career System; and d) the applicant and the division/unit where he/she is assigned should be directly involved in the conduct of one or a combination of S&T activities mentioned in the guidelines. It covers the following disciplines: basic and natural sciences and mathematics, engineering and information and communication technology, medical sciences, agricultural sciences and selected fields of social sciences.^[33]

Results also show that respondents with higher intrinsic motivations in doing research (MOT_A, $p=0.011$) are more likely to publish than those with lower intrinsic motivations. As discussed above, intrinsic motivation is related to passion and enjoyment

Table 6: Degree of seriousness of the challenges encountered by the respondents in engaging in research and publication.

Factors	Mean	D.E.	Rank
Limitations of Resources			
Time lag between the submissions of proposal to approval of proposal. Thus, the researcher losses his/her momentum to work.	3.39	VS	2.5
Time lag between the submissions of article until its publications.	3.39	VS	2.5
Too much non-teaching related requirements in the University.	3.57	VS	1
Research assistants are limited to the centers or institutes where they belong and are not shared to faculty researchers.	3.13	MoS	6
Resources or materials that are approved are not duly given to the faculty researchers.	3.21	MoS	4
The trainings given in relation to research are not intensive and systematic	3.15	MoS	5
Overall Mean	3.30	VS	
Monetary Incentive Issues			
Not real time giving of incentives.	3.34	VS	1
Incentives are not given immediately.	3.13	MoS	2
The monetary support given by the University is not enough.	3.12	MoS	3
The monetary incentives given by the University is not enough.	3.01	MoS	4
Overall Mean	3.14	MoS	
Unclear Policies Related to Research Activities			
Doing research requires time and effort; it should be given 6 units ETL.	3.76	VS	1
Benchmarking must be open to all researchers not only to those who hold administrative functions.	3.71	VS	3
The time in and out of faculty researchers during the lunch break must be suspended, esp. for those conducting studies outside the University.	3.74	VS	2
Some policies on conducting research (i.e. ETL) are unclear and are not being implemented.	3.49	VS	4
Overall Mean	3.68	VS	
Attitude Issues			
The people working in the research and publication sections are not supportive and have inappropriate attitudes.	2.62	MoS	3
Professorial faculty who are not doing research demotivate the faculty.	2.88	MoS	1
There is competition among faculty in one department	2.71	MoS	2
Overall Mean	2.71	MoS	
OTHERS			
I am not confident to conduct research because I have limited skills and competencies in relation to research.	2.93	MoS	2
I am not mentored by senior researchers in the University.	2.79	MoS	4.5
Degrading comments from reviewers discourages me to research or publish	2.84	MoS	3
Junior faculty do not have interest in research	2.79	MoS	4.5
Junior faculty do not have interest to be mentored	2.71	MoS	6
Seasoned researchers have no time to mentor	3.22	MoS	1
Overall Mean	2.85	MoS	

3.25-4.00 Very Serious (VS); 2.50-3.24 Moderately Serious (MoS); 1.80-2.49 Minimally Serious (MiS); 1.00-1.79 Not Serious (NS).

Table 7: Logistic Regression Parameter Estimates of Faculty Publication.

Variable	Final Model: (Dep. Variable: 1 if faculty has publication; 0 otherwise)	
	EXP(B)	SIG
constant	0.022	0.077
EDUC	2.898*	0.046
DOST_S&T	6.394**	0.009
NUMRES	1.074	0.154
MOT_A	2.766*	0.011
MOTMEN_A	0.519*	0.039

in doing research, desire to discover new things and enrich knowledge and finding meaning or significance or fulfillment from doing research. The accounts of the faculty researchers interviewed in-depth all point to the value of faculty having a strong interest in research and its significance. For example, one researcher mentioned that “without passion for research, a faculty member is less likely to excel in research,” considering all the constraints and the many things required of faculty members. This result is supported partly by the needs-based motivation theory in which at the higher level of hierarchy is the need for self-actualization.^[10,34] In addition, another motivation theory says that one psychological state related to workplace motivation is meaningfulness of work.^[14]

Some of the faculty researchers also find the actual research experience in the field, the research outputs and the enriched knowledge through experience as useful in their profession as teachers. One faculty teaching a technical field and one social researcher serving as affiliate faculty both underscored the point that with rich research experience, one is able to connect theory and practice, or theory and reality when teaching basic or applied courses. As one faculty informant puts it, research contributes to curricular development. One important metrics in research dissemination in universities is the number of syllabi enhanced based on research outputs. Researchers from the College of Nursing, for example, underscored that integrating their research results in the syllabus means improving the student’s learning to meet the demands of the changing times and developing critical thinking.

Also, concerning motivation, respondents who have higher motivation in mentoring to sustain research culture at the university are more likely to publish than their counterparts (MOTMEN_A, $p=0.039$). The faculty members who are motivated to mentor junior researchers recognize that they were also recipients of mentoring by their seniors and that the sustained accreditation of their academic programs is affected by the status of research in their department. One metric being measured in the area of research during accreditation is the number of published articles. Those who are motivated to sustain

the research culture at the university need to model publishing their research outputs.

CONCLUSION

Only a few faculty members in the case state university are involved in research and only a few of these faculty researchers go to the extent of publishing their outputs in research journals. While the average number of publications is typical of a Philippine university, the range in the number of publications is wide with some faculty members having zero journal publications, while a few have more than 20 journal publications. Intrinsic motivations, rewards and performance goals and compliance with requirements motivate faculty members to conduct research and sustaining research culture at the university and self-fulfillment motivates them to mentor young researchers. However, the need for promotion and the importance of publishing research results were perceived to be their highest motivation to go to the extent of publishing their research outputs in research journals. Their perceived major challenges in conducting research and publishing include limitations of resources, monetary incentive issues, unclear research-related policies and faculty attitude issues. Finally, observed data reveal that significant predictors of faculty publishing in journals are educational attainment, DOST S&T accreditation, intrinsic motivation in doing research and motivation to mentor in order to maintain the university research culture. These quantitative results and specific issues are powerfully supported by narratives from faculty members.

Based on the above conclusions, policies in the research and extension, academic and administrative sectors of the university concerning research and publications need to be harmonized to address the unclear policies and sustain and further strengthen the implementation of policies that support the highly motivating factors. In addition, further studies on strategies to increase intrinsic motivation in doing and publishing research and encouraging younger faculty to do graduate studies in universities abroad are recommended.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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