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LEVELS OF MANAGERIAL AND TECHNICAL COMPETENCIES OF FORESTRY GRADUATES FOR POLICY INTERVENTION: A STUDY AT AKLAN STATE UNIVERSITY, PHILIPPINES

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ABSTRACT

The managerial and technical competencies of forestry graduates at Aklan State University (ASU) in the Philippines are indispensable to level up forestry education program, especially realigning faculty, upgrading of classrooms and research facilities towards ASEAN educational framework. Forty respondents out of ninety-eight graduates from school year 1999 to 2013 participated in this study. Developed questionnaire was used to gather data through interview and social media. Descriptive research method was used to determine the frequency and mean to describe the levels of managerial and technical competencies of graduates prior to employment. These levels were classified as either not competent, less, middle, high or highly competent. Results showed that forestry graduates had a "middle competent" level of managerial competency and a "highly competent" level of technical competency prior to employment. The levels of managerial and technical competencies were gradually increasing from 1999 to 2013. However, their perceptions towards forestry profession were alarming and decreasing. They encountered challenges, especially in applications of theory and principles to actual situations. Findings emphasized that students' exposure to actual learning activities, upgrading of classrooms and research facilities, faculty hiring and training, as well as industry immersion should be the basis of policy intervention for the forestry education program.

KEYWORDS:

forestry graduates, level of competencies, managerial, technical and policy intervention

1. INTRODUCTION

The Aklan State University (ASU) has been recognized as one of the best performing universities in the field of agriculture in the Philippines. This achievement however was associated with challenges and opportunities on the sustainability to deliver quality education. In 2013, the over-all passing percentage of graduates in the forestry licensure examination was 28.57% below from the national passing percentage of 35.22 % (ASU Monitoring Report, 2013), which was alarming.

The Bachelor of Science in Forestry (BSF) Program was implemented based from CHED CMO No.44, s. 2006, Policies, Standards and Guidelines of Forestry Education Program, designed for four years period of study to provide knowledge and skills to students especially in facing problems and issues concerning management of forest, environment and natural resources (CMO No. 44, 2006 and Raga-as, 2017).

The BSF program started with a Two-Year Forest Ranger Course in 1983 and in 1994, it became a ladderized course. Due to limited number of enrollees, it was deactivated for four (4) years and was reactivated in 2013 with twenty-seven (27) enrollees. Of these, twenty three (23) graduated in 2017. A total of ninety-eight (98) forestry graduates from 1994 to 2013 (Saladar, 2017), were the subjects of this study.

2. STATEMENT OF THE PROBLEMS

The study determined the levels of managerial and technical competencies of forestry graduates of the Aklan State University from 1999-2013 and their perceptions on the forestry profession based on professional forestry courses prior to their employment. Specifically, the study attempted to:

1. Describe the profiles of respondents such as: age, gender, civil status, year graduated, highest degree attended, seminar attended, number of years employed, employer, present position and status of employment.
2. Determine the level of managerial and technical competencies of the forestry graduates and their perceptions on forestry profession based on forestry professional courses.
3. Describe challenges met by forestry graduates and offer recommendations as bases for policy intervention.

3. CONCEPTUAL FRAMEWORK OF THE STUDY

Systems Theory was used in this study to develop a holistic view on level of managerial and technical competencies of graduates and their perceptions on forestry profession within the context of professional courses of the forestry program. It applied to understand the learning situations of forestry graduates during their school days where several systems inextricably connect and influence one another affecting the performance of the university in the forester licensure examination (Bertalanffy, 2013). The figure below is a developed framework based from System Theory to guide the study.

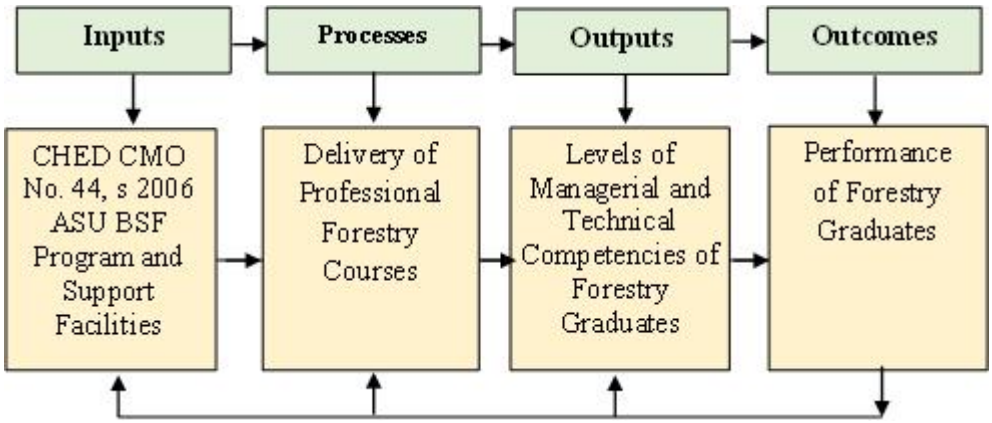

Figure 1. Conceptual Framework of Levels of Managerial and Technical Competencies of Forestry Graduates of Aklan State University.

The System Theory was employed to guide contextual understanding of the managerial and technical competencies of forestry graduates and their perceptions on the profession based from professional courses of the program that lead to identify the most appropriate interventions for the improvement of forestry program of the university.

System Theory was developed from the general systems theory proposed by the biologist Ludwig von Bertalanffy. He recognized a compelling need for a unified and disciplined inquiry in understanding and dealing with increasing complexities that are beyond the competence of any single discipline (Bertalanffy, 2013).

Bertalanffy further described that the System Theory need to "pursues scientific exploration, understanding, and controlling of systems". He emphasized that "in order to evaluate the modern "system approach," it is advisable to look at the system idea not as an ephemeral fashion or recent technique, but in the context of the history of ideas" (Bertalanffy, 2013).

4. METHODOLOGY

Descriptive research method was used to describe the levels of managerial and technical competencies of forestry graduates classified either as not competent, less, middle, high or highly competent. The data was gathered using developed survey questionnaires.

5. SAMPLING DESIGN

Slovin's formula was used to determine the total number of respondents out of 98 forestry graduates with a sample size (n) of 40 shown in Table 1 below.

$$n = \frac{N}{(1+Ne^2)}$$

Where:
N = the sample size set as 40
N = the size of the population set as 98
e = the margin of error set at 5%, by substitution

$$n = \frac{98}{1 + 98\,(.05)^2}$$

n = 40.81 or 40

Table 1. Distribution of Respondents by School Year

School Year	N	n
1999-2003	34	12
2004-2008	49	20
2009-2013	15	8
Total	98	40

6. SURVEY INSTRUMENT AND RESEARCH ETHICS

The survey instrument was developed based from the forestry profession courses in CMO 44, s. 2006. It covered the profile of the respondents, managerial and technical competencies, perceptions of graduates on forestry profession and challenges they met before their employment.

The questionnaire was bound with code of ethics that the respondents have their right or refuse to participate in the study. It includes protections of respondents from physical or psychological harm including loss of dignity, protection of

privacy, confidentiality and protection against unjustifiable deception.

7. DATA ANALYSIS

The data was clustered into group of forestry graduated from school year 1999 to 2003; 2004 to 2008; and 2009 to 2013 as indicated in the Table 2.

Table 2. Scales and Levels of Competencies

Scales	Descriptors' Levels of:	
	Competency	Perceptions
4.50 - 5.00	Highly competent	Very high
3.50 - 4.49	High competent	High
2.50 - 3.49	Middle competent	Moderately high
1.50 - 2.49	Less competent	Low
1.00 - 1.49	Not competent	Very low

8. RESULTS AND DISSCUSSION

Profile of the Respondents

Majority of the respondents were males, 21 or 52.5%, and 19 or 47.5% of them were female. Their age ranging from 30 to 40 (60%) years old, most of them were married 25 or 62.5% and 15 or 37.5% were not married. Twenty four (24) or 68.58% of them were employed from 1 to 5 years. Others were employed from 6 to 10 years with total average of 6 or 17.54% and 5 or 14.28% were employed above 11 years. Most of respondents were employed in the DENR with the total average of 14 or 41.66%. Some employed by LGU with a total average mean of 12 or 25.56%, and about 3 or 7.22% of them were self-employed. Twelve (12) of first batch of forestry graduated from 2004-2008 were employed in the front line service such as clerk, security guard, cook and other related works.

The forestry graduates were employed as Forest Extension Officers one (1), Planning Officers one (1), Foresters four (4), Agriculturist Technologist five (5), Forest Ranger six (6), Environmental Management Specialists eight (8), Community Empowerment Facilitator one (1) and three (3) of them were self-employed.

Managerial and Technical Competencies

The data was organized by cluster of school year graduation within 1999 to 2003, 2004 to 2008 and 2009 to 2013. The mean, average means and grand mean in each of the cluster were used to determine the levels of managerial and technical competencies.

Managerial Competency: Table 3 shows the average mean of managerial competent of forestry graduates from 1999 to 2013 in the 6 professional courses which was progressing from 2.61, 2.54 and 2.84 respectively. The grand average mean was 2.66 or "Middle" competent in management.

Agroforestry System was found low level in managerial aspect across the cluster of school year. Wood Structure and Technology was on moderately high level with an average mean of 3.01. This was followed by Forest Research with average mean of 2.94, Forest Biological Science (FBS) an average mean of 2.59, Forest Resource Management, an average mean of 2.54, Social Forestry, an average mean of 2.65 respectively.

Over all, the level of managerial competency of forestry graduates in 6 professional forestry courses was categorized into "middle" level of competency.

Table 3. Managerial Competency of Forestry Graduates

Courses	Cluster of School Yeas Graduated			Ave. Mean	Levels of Competency
	1999-2003	200-2008	2009-2013		
1. FRM	2.55	2.14	2.93	2.54	Middle
2. FBS	2.52	2.42	2.83	2.59	Middle
3. WST	3.97	2.26	2.80	3.01	Middle
4. SF	2.63	2.48	2.83	2.65	Middle
5. FR	2.42	3.73	2.68	2.94	Middle
6. AFS	1.54	2.23	2.95	2.24	Less
Ave. Mean	2.61	2.54	2.84	2.66	Middle

Technical Competency: Table 4 shows the grand average mean of technical competency of forestry graduates from 1999 to 2013 was increasing from an average mean of 2.47, 2.62 and 3.01 before their employment. The grand average mean was 4.63 categorized as "high" level of competency, higher than managerial with grand average mean of 2.66. This data implies that the forestry graduates perceived themselves that they were technically prepared prior to their employment.

Of the professional forestry courses across the cluster school year, Social Forestry had the highest average mean of the 2.89. This was followed by Agroforestry Systems with an average mean of 2.89, Forest Biological Science an average mean of 2.72, Forest Resource Management average mean of 2.58 and Forest Research an average mean of 2.55.

Table 4. Technical Competency of Forestry Graduates

Courses	Cluster School Year Graduated			Ave. Mean	Levels of Competency
	1999-2003	2004-2008	2009-2013		
1. FRM	2.37	2.22	3.15	2.58	Middle
2. FBS	1.97	3.32	2.88	2.72	Middle
3. WST	2.35	2.04	3.08	2.49	Less
4. SF	2.25	3.62	3.03	2.97	Middle
5. FR	2.27	2.35	3.03	2.55	Middle
6. AFS	3.63	2.15	2.88	2.89	Middle
Ave. Mean	2.47	2.62	3.01	4.63	Highly

In general, forestry graduates had "middle" level of technical competency in majority of professional forest courses with the exception of Wood Structure and Technology that got the lowest average mean of 2.49 and the impression of "less" competent.

Perceptions of Graduates on Forestry Profession

Table 5 shows the levels of perception of forestry graduates toward their profession. The general trend of perception were declining from "high" to "middle" level of perception with an average mean of 3.17 during 1999-2003, 2.53 for 2004-2008 and 2.78 for 2009-2013, respectively.

The highest average mean was found in Wood Structure and Technology with an average mean of 3.15 and the lowest was in Social Forestry with an average mean of 2.63.

Across the school year and professional courses, the graduates perceived forestry profession at "middle" level. It means that presently, the forestry graduated from 1999 to 2013 perceived their profession was not attractive as they compared it on 2004 BSF program offering of the university.

Table 5. Perceptions of Graduates on Forestry Profession

Courses	Cluster School Year Graduated			Ave. Mean	Levels of Perceptions
	1999-2003	2004-2008	2009-2013		
1. FRM	3.63	2.50	2.92	2.93	Moderately
2. FBS	3.25	2.20	2.75	2.73	Moderately
3. WST	3.25	3.45	2.75	3.15	Moderately
4. SF	2.75	2.30	2.83	2.63	Moderately
5. FR	3.13	2.40	2.50	2.68	Moderately
6. AS	3.00	2.30	2.90	2.78	Moderately
Ave. Mean	3.17	2.53	2.78	2.81	Moderately

The data shows that the trend of the levels of forestry graduates' perception on their profession as forester was challenging. It implies that forestry is not a lucrative profession as compared with other professions. It could be argued that the perception of respondents on their profession was more on economic aspect rather than ecological and environmental concerns.

The forestry profession play a critical role in the advancement of science and technology on conservation and protection of natural resources especially in mitigating the adverse environmental effects of climate change. The findings suggest that forestry code ethics and values on ecological and environmental concerns should be strengthened in teaching professional courses. Strengthening forestry admission and retention policy with proper directions with value appreciation of ecosystems are vital in forestry profession.

Challenges Experienced by Forestry Graduates

Table 6 outlines the challenges encountered forestry graduates during their school day elicited during the interviews. The information could be useful inputs in revision of forestry curricular programs, improvement of forestry student learning facilities and improvement of academic policies of the university.

Table 6. Challenges Met by Graduates during School Days

Professional Courses	Description of Challenges
1. Forest Resource Management	Limited actual field experiences due to long time schedule of lectures and some off course contents not rely applicable to actual office works and functions as professional forester.
2. Forest Biological Sciences	Lack of practical skills in identification, evaluation of location, analysis of local climate conditions, ecosystem protection, and forestry project evaluation.
3. Wood Structure and Technology	Difficulties in articulation of wood science applications, to forest law enforcement and forest products and protection activities.
4. Social Forestry	Lack of exposure to social forestry projects on community interactions and involvement in extension and outreach activities.
5. Forest Research	Limited actual experiences in research on current forestry development, innovations and environmental concerns.
6. Agroforestry System	Limited exposure on agroforestry projects and other related forestry development projects.

9. DISCUSSION

The findings indicate the challenges and offer opportunities to identify appropriate interventions to improve forestry education program of the university. This has relations to the work of Frick and Thompson (2014) who developed an Educational Systems Theory (EST) for making scientifically based predictions of the outcomes of education systems change efforts. The EST was extended originally from the theory developed by Maccia and Maccia (1966) cited by Frick and Thompson (2014) that it has many applications, including direct analysis of any discrete educational or learning system.

Frick and Thompson argued that to develop an underlying educational systems theory it can be tested through logical and empirical validation. They emphasized that the main goal of educational reform is to improve student academic achievement, and if successful, this would be expected to subsequently improve economic conditions and the quality of life. They explained that the EST can predict which changes are likely to result in improved student learning achievement versus those that are not, and predict which kinds of learning achievement are likely to improve the quality of life. Thus, the findings of this study can guide decision making instead of guesswork on what interventions should be introduced to improve the forestry program of the university.

Physical observations indicated that efforts of management in modernizing the classrooms and other learning facilities were noted. However, like other academic program BSF program also required specific classrooms and updated research facilities as well as students' exposure in research and extension activities. Such findings consistent to the work of Joseph and Reigeluth (2010) who developed a "conceptual framework for a systemic change process, both to help researchers advance knowledge about how school districts can engage in paradigm change, and to help educators and policy makers understand the big picture for such change" that lead to the improvement of the managerial and technical competencies of forestry graduates.

The findings also supported by McGuire et al (2003) who explain that the competencies are particular qualities that a company's recruiters have decided are desirable for employees to possess. It is the bridge between traditional credit hour measures of student achievement and the learning revolution. McGuire defined the competencies as "a combination of skills, abilities, and knowledge needed to perform a specific task." Competency-based initiatives are those purposeful actions undertaken by postsecondary institutions directed at defining, teaching, and assessing competencies across their system.

10. CONCLUSIONS

The level of managerial and technical competencies of forestry graduates was progressively increasing from 1999 to 2013. The technical competency was higher than managerial competency of forestry graduates prior to their employment. In contrast, forestry graduates' perception on their profession was gradually declining from 1999 to 2013 and the trend was challenging, due to fact that forestry was not a lucrative profession as compared to other professions. The perception of the respondents was more on personal and economic aspects rather than ecological and environmental concerns.

The forestry graduates encountered various challenges in the professional forestry courses during their school days. Limited actual field experiences and practical skills, problem on articulation of principles and concepts of subject matter and lack of exposure on actual forestry were significant information needed in revising the curriculum, upgrading student learning facilities and need new faculty to upscale the forestry program of the university.

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