



Evaluation of Solid Waste Management Program in Laguna State Polytechnic University, Santa Cruz Main- Campus: Input to Policy Formulation

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Abstract:

A research involving the Assessment of Solid Waste Management Program in Laguna State Polytechnic University (LSPU), Santa Cruz Campus is described in this paper. The descriptive method of research was employed in this study to gather the necessary data and information on the study of Solid Waste Management. The purpose of the study is to determine the current status of Solid Waste Management program of Laguna State Polytechnic University, Santa Cruz Campus. Specifically, this research intends to: 1.) Determine the knowledge, attitude and practices of administrators, faculty, and staff, students, and solid waste workers (janitors and garbage collectors), 2.) Determine the compliance of administrators, faculty, and staff, students, and solid waste workers (janitors and garbage collectors), and 3.) Develop a plan of action base on the result of the study that will address the problems on solid waste within the school community. The program is commencing its initial year of implementation on solid waste management, but it seems that, there is a decrease in the participation among the different offices and department in LSPU community to the strategies of the program and evaluation as to its implementation has not been done. The initiation of such program is essential to rapidly educate the public and facilitate the development of environmentally friendly community waste behavior. Environmental knowledge and attitude of students appears to be crucial as they ultimately play an important role in providing solution to future environmental problems. Indeed, LSPU consider to be having the growing number of educators, may include environmental education an essential part of good education. Delgado, (2011) Education for sustainable development entails building a culture among people, it is a matter of imparting knowledge and developing skills as it is shaping attitudes, and practices are adopted on the different university as these relate to sustainable solid waste.

Key words: Solid Waste Management, Environmental Education, Environmental Attitudes, Knowledge and Practices, Sustainable Environment, Compliance, Laguna State Polytechnic University

INTRODUCTION

Unhealthy disposal of solid waste is considered one of the most important problems in many societies. Soriano, (2010), the problem of waste management has risen recently in developing countries where there is a little history of the implementation of formal and informal community environmental education awareness program. Solid waste refers to the range of garbage arising from animal and human activities that are discarded as unwanted and useless. Solid waste is generated from industrial, residential and commercial activities in a given area, and may be handled in a variety of ways.

The Municipality of Santa Cruz, Laguna, headed by Mayor Domingo Panganiban passed an ordinance in developing an environmental awareness program to all educational institutions and barangays in Santa Cruz, Laguna that will educate and train the community to be sensitive to the issues regarding environmental concern. It will do its share in addressing part of the environmental concerns and consequences due to the development action called progress. One of the environmental concern is solid waste. The solid waste program of Laguna State Polytechnic University was implemented last May 2015.

Apparently, it was last June 29, 2017 where the municipality of Santa Cruz invited all the State Colleges and Universities as well as public elementary and high schools within the area to exercised systematic solid waste management. The purpose of this program is to 1.) Develop and implement a campus zero waste policy and strategy, 2.) Transform the university in zero waste form, 3.) Encourage staff to avoid waste and to reuse and recycle more, and 4.) Awareness of environmental waste issues and behavior change on those issues. Also, it was a system put in place to deal with the increasing volume of garbage produced by the university and comply with the Ecological Waste Management Act of

2000 (Republic Act 9003) in addressing the growing global concern of environment and public health protection. Further, the very essence of the effort in putting a system in place is to create a counter culture that may combat the current practice of a throwaway society.

Palmer (2015), to be successful, useful programs should be designed to engage their target audiences is not only on increasing their environmental knowledge but their environmental skills, attitudes and behavior as well. Accordingly, a first step in the program design process is to establish the prior knowledge of specific age groups, covering such categories as the level of knowledge, its sources and everyday application.

In the study by Bator (2011), there appears to be lack of knowledge of the recycling procedure among Environmental Studies students of Waterloo University. The students of the college are environmentally-based than the rest of campus, so an assumption was made that as a whole the students at the university are the same or less knowledgeable on recycling procedure. In order to increase knowledge on campus, it was recommended that a more diversified sources of educating are needed.

Today an ever growing number of educators consider environmental education an essential part of good education. In a case study demonstrated the indisputable value of environmental education for primary and secondary students and environmental awareness program for the public. When people receive and understand the information about their environment, then can effectively work toward reducing environmental degradation, (World Bank, 2008).

METHODOLOGY

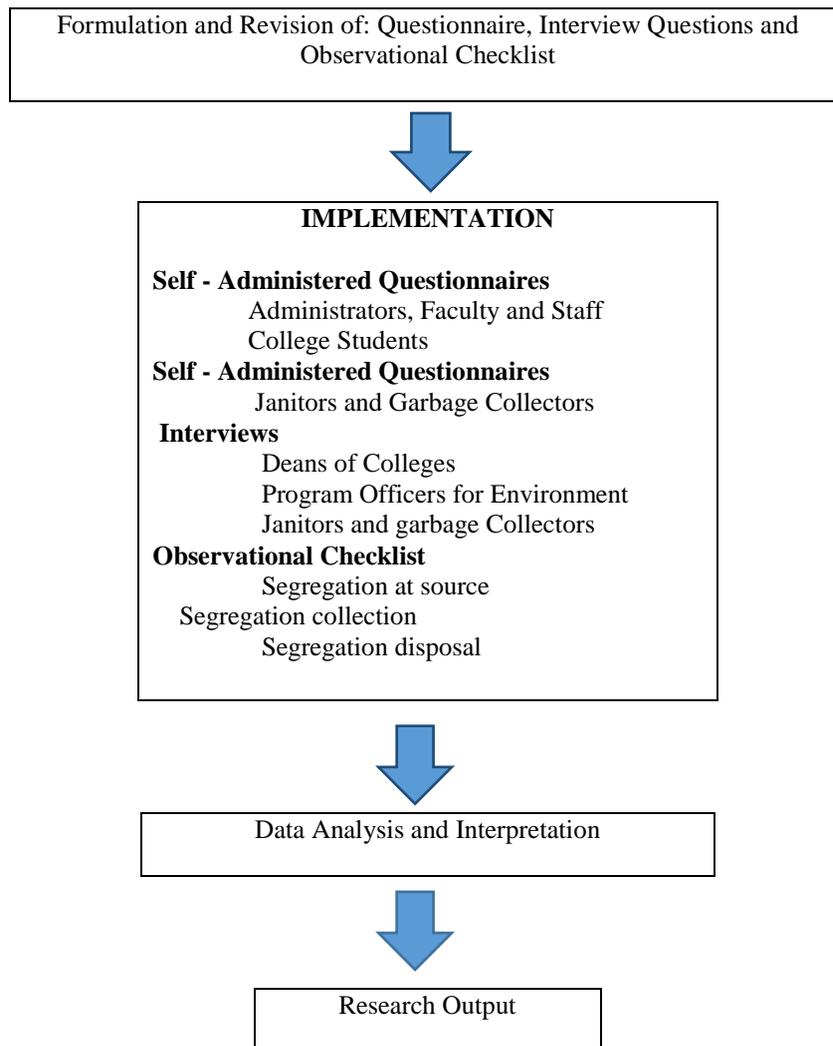
The descriptive method of research was employed in this study to gather the necessary data and information that help the researchers plan and carry out descriptive studies, design to

provide descriptive details about people, places and phenomena.

The self-administer questionnaire was forwarded to the office of the deans of the colleges to be answered by faculty members, academic staff and students. To the office of administration for the non-academic staff and for the

administrators of the university. An interviewer-administered questionnaire was employed among the solid waste worker (janitor and garbage collectors) by the researchers regarding their respective roles in the implementation of Solid Waste Management program in LSPU.

Flow of Activities



RESULTS AND DISCUSSION

Percentage on the Awareness of the respondents on Solid Waste Management Program in LSPU

Item	Participants		
	Administrators, Faculty and Staff N=100	Students N=200	Janitors and Garbage Collectors N=15
Media Campaign			
• Room-to-Room Campaign	48(48%)	71(35.5%)	N/A
• Materials Written on the trash bins	14(14%)	52(26%)	5(33.33%)
• Posters	25(25%)	43(21.5%)	6(4%)
• Flyers	6(6%)	20(10%)	4(26.67%)
Seminars and Orientation	4(4%)	7(3.5%)	N/A
Classroom / Integration in Subjects	3(3%)	7(3.5%)	N/A

It can be gleaned from the table the percentages and frequencies on the level of awareness of the respondents on solid waste management program of LSPU, it can be further noticed from the responses of the administrators, faculty and staff, on room-to-room campaign got the highest percentage of 48%, followed by posters as media campaign materials with 25 %, materials written on the trash bin got 14% while flyers, seminars and orientation, and integration in subject got the lowest percentage of 6%, 4%, and 3% respectively. Accordingly, on the part of the students, room-to-room

campaign got the highest percentage of 35.5%, followed by materials written on the trash bin, 26%, and lastly 21.5%, 10% and 3.5% on posters, flyers, classroom integration respectively. However, the level of awareness of janitors and garbage collectors was 33.33% on materials written on the trash bin, while 26.67 % and 4% for flyers and posters respectively.

A critical component in any waste management program is public awareness and participation, in addition to appropriate legislation, strong technical support, and adequate funding. Waste is the result of human activities and everyone

needs to have a proper understanding of waste management issues, without which the success of even the best conceived waste management plan becomes questionable, (Ismail, 2015).

Results also indicated that all of the respondents showed satisfactory levels of awareness and responsibility regarding solid waste management. However, there is still the need for the university to encourage through education and practices on managing solid waste in the campus among the

students. To ensure compliance with solid waste management program. Universities and colleges must make sure participation in the program it introduces remains high. This can be done by raising the administrators, faculty and staff, students' education and awareness level of waste. To achieve this, a carefully thought-out waste education and awareness strategy must be developed in order to change students' habits and behavior and traditions.

Knowledge and Attitude Mean Score and; number of respondents who practiced segregation of waste

Respondents	Knowledge	Attitude	Practices on Segregation of waste (Frequency %)		
	Mean	Mean	Always	Sometimes	Never
Administrators, Faculty, & Staff (N=100)	12.34	37.26	72 (72%)	28 (28%)	0
Students (N=200)	12.82	31.18	93 (46%)	102 (51%)	5 (3%)
Janitors & Garbage Collector (N=15)	12.01	37.55	15 (100%)	0	0

Knowledge and Attitude

The mean attitude scores for administrators, faculty and staff was 37.26. For the students it was 31.18 and 37.55 for the janitors and garbage collectors of LSPU. While the mean knowledge scores were 12.34, 12.82 and 12.01 for the administrators, faculty and staff, students, janitors and garbage collectors respectively.

Knowledge about a given issue has been recognized as one of the major determinants that shape the attitude, and practice of a community. Now a day's environmental problems in general and mishandling of wastes in particular are among the leading causes for ill-health and impediments for national development. Improper waste management may have health and environmental hazards, (Abdullah, I.K., et.al., 2014).

Practices

Majority of the administrators, faculty and staff (72%, 72/100) claimed that they always practice segregation while 28% of the respondents answered, that they sometimes practice waste segregation. Forty six percent of the students claimed that they always practice segregation as part of the solid waste

management program of the school community. While, 102 or 51% of the students says that they sometimes practiced and 5 or 3% claimed that they really did not practiced the segregation procedures. On the part of the janitors and garbage collectors, there were 15 or 100% who claimed that they practice the right segregation of solid waste material as part of their job.

Several community surveys have sought to capture the practices among students regarding the environment. Students are particularly targeted since they are regarded as the future generation and schools are expected to develop their potential as advocates of sustainable environment (Ahmad et al., 2015).

Studies have also shown that students exhibit moderate to unsatisfactory practice level on waste management (Adeolu, et al., 2014; Ahmad et al., 2015). Therefore, this study was conducted to capture the level of knowledge, attitude, and practices of college students on solid waste management. This is to elucidate the roots of continuing problems on solid wastes towards improved environmental integrity, especially in the Municipality of Los Baños, Laguna.

Compliance of administrators, faculty and staff, students, and solid waste workers (janitors and garbage collectors) on Solid Waste Management Program

Compliance	Mean	Verbal Interpretation	Rank
Engineering Component			
1. Segregation at Source	2.51	Moderately Complied	2
2. Segregation Collection	2.79	Moderately Complied	1
3. Segregation Disposal	1.67	Complied	3
Composite Mean	2.32		
Education Component			
1. Media Campaign	2.45	Complied	3
2. Training and seminars	3.01	Moderately Complied	1
3. Classroom /Subject Integration	2.60	Moderately Complied	2
Composite Mean	2.68		
Enforcement/Administration Component			
1. Periodic Monitoring	2.64	Moderately Complied	2
2. Periodic External Evaluation	3.05	Moderately Complied	1
3. Penalty/Punishment	1.38	Not Complied	3
Composite Mean	2.37		

Table above shows the compliance of the administrators, faculty and staff, students, and solid waste workers on solid

waste management program of LSPU. It was the education component who got the highest composite mean of 2.68,

indicators for training and seminars have a mean of 3.01 and rank first. While classroom or subject integration of waste management got a mean of 2.06, rank second and interpreted as moderately complied. However, media campaign was rank third and got a mean of 2.45, interpreted as complies. It only shows that the education component with regards to waste management do not give emphasis on the factors that contribute to the non-compliance in the program, it was proven with small values for each indicators as the result of the survey.

Enforcement/Administration component got the second highest composite mean of 2.37. It was periodic external monitoring and periodic monitoring having the same result of verbal interpretation of moderately complied with mean of 3.05 and 2.64 respectively. Unfortunately, indicator regarding penalty/punishment was not implemented on the part of the enforcement committee, it is realize with the lowest value of 1.38 being answered by the respondents which is the subject of the study.

Lastly, the engineering component of LSPU on solid waste management program got the composite mean of 2.32. It was the segregation collection as well as segregation at source, introduced to have an interpretation of moderately complied with mean of 2.79 and 2.51 respectively, and rank first and second. However, segregation disposal got the lowest mean of 1.67 on the part of engineering component and rank third as seen by its lowest value, as the result of survey/ questionnaires with the respondents of the study.

CONCLUSION

The study concludes that administrators, faculty and staff, students and solid waste workers have appropriate knowledge and positive attitude on the Solid Waste Management Program in Laguna State Polytechnic University, Santa Cruz Campus. But, majority of the respondents especially the college students were not compliant to the waste segregation strategy.

It is also noted that, janitors and garbage collectors, though mostly aware about the program were generally noncompliant as to the collection and disposal strategies. Therefore the three strategies (segregation at source, segregation collection, segregation disposal) in waste management were not strictly implemented. Finally, the level of policy on enforcement of the program needs to consistent while the required component of the system (engineering, education, enforcement) need further improvement.

RECOMMENDATIONS

The three components of the system namely: engineering, education and enforcement/administration need some improvement for a better implementation of the program:

1. Engineering component Segregation at Source

Trash bins must be available across campus at all times. Majority of the administrators, faculty, staff and students received most of the information about waste segregation from materials written on the trash bins. If possible, aside from the color, there is a need to make the size and design of the trash bins uniform with better labeling of what should be thrown in a particular color bin.

Segregation collection and disposal

Improve the segregated collection strategy especially for biodegradable and disposal waste by: intensifying the information education campaign. Amending the mandate imposed on solid waste workers to collect separately the biodegradable and disposal wastes. An incentive scheme must be provided among the solid waste workers. There must be a concrete operational plan for biodegradable

waste by having a compost pit right within the campus.

2. Education component

The information education campaign must be continued and sustained to maintain awareness among members of LSPU community especially among the students as the population of students constantly changes every year. The information educational campaign must include about the Solid waste management program works and not just about the color coding scheme on waste segregation but their roles in the total program. If possible, information education campaign through room-to-room information drive be done at least twice a week in a semester, once during the mid-term. The faculty, meanwhile, should continue to integrate environmental education in their specific subject areas, as well as to facilitate interdisciplinary work focusing on problems related to solid waste management on campus.

The implementers should try out other forms of information and education campaigns to enhance the participation of groups or individuals such as the possibility of a category on the yearly President's Award for the best college or department participating in waste segregation.

Information about the Solid waste Management program should be made available to students through the LSPU official website and in the Student Handbook.

3. Enforcement / Administration component

The University should institutionalized the periodic monitoring component of its Solid waste Management program. The monitoring can be done by appropriate community body to look into people involved in the different component and strategies of the program. The university should initiate a periodic external evaluation of its Solid waste Management program to be undertaken periodically by an adequate group outside of its management team.

The University should have a policy especially among students mandating that non-compliance a penalty of three (3) would carry a punishment/ sanction/penalty by rendering a service or suspension. Students should be challenge to strive for excellence not just in academics but also to accountable respond to social realities and social issues like solid waste problems.

Finally, in the spirit of community service, the University should share with other universities and colleges and institutions both public and private, its solid waste management program that has evolved more than a year of its implementation.

REFERENCES

- [1] Bator, Leon et al. (2011). On Campus Recycling Knowledge and Environmental Attitude of High School Students. *J. Environ Educ*, 30(3): 17-21.
- [2] Delgado, et al. (2011). Survey of Knowledge, Attitudes and Practices of Yazd university of Medical Sciences Students about Solid Waste Disposal and Recycling. *Iranian J Env Health SciEng*, 2(2): 26-30.
- [3] Palmer, J.A. (2015). Environmental Thinking in Early Years: understanding the Concepts related to waste management. *J Environ Educ Research*, 1(1): 35-35.
- [4] Soriano, L. E., (2010). Education for Sustainable Development in the Third Millennium: the Philippine

Perspective. Philippine Council for Peace and Global Education, Philippines.

- [5] World Bank, 1993. Effective schooling in Environmental Education. Education and Social Policy Department. Washington, D. C
- [6] Knowledge, Attitudes, and Practices on.... Available from:
https://www.researchgate.net/publication/304716473_Knowledge_Attitudes_and_Practices_on_Solid_Waste_Management_among_Undergraduate_Students_in_a_Philippine_State_University [accessed Aug 23 2018].
- [7] Adeolu, A.T., Enesi, D.O., Adeolu, M.O. 2014. Assessment of Secondary School Students' Knowledge, Attitude
- [8] Ahmad, A. L., Rahim, S. A., Pawanteh, L., Ahmad, F. 2012. The Understanding of environmental citizenship
- [9] Ismail, N. 2015. Investigating Students' Environmental Knowledge, Attitude, Practice, and Communication. Asian Social Science 11: 284-293