Standards of Excellence of Bachelor of Science in Agricultural Engineering in a State University: A Tracer Study

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Abstract

This research focused on the feedbacks of Bachelor of Science in Agricultural Engineering graduates of Romblon State University on the standards of excellence of their course. Using the descriptive research design, the researcher looked into the quality level of the program in terms of standards of excellence, the knowledge and skills applied and the graduates' job satisfaction. A total of 265 respondents were the participants of the study; one hundred twenty-four (124) BSAgEn graduates, one hundred nineteen (119) employers and twenty-two (22) members of the school top management. Random sampling was observed in selecting the graduates; however, the sample respondents depended on the availability of graduates' track records and addresses. Three sets of instruments were used to gather the data; one for the graduates, one for the employers and another for the school officials. The graduates' feedback was validated by the employers and members of the school top management. Differences in perceptions between respondents were tested. Data analysis was through software on Statistical Package for Social Research. Findings revealed that BSAgEn program has relative strength and was rated "Very Satisfactory" in terms of VMGO, Administration, Curriculum & Instruction and Faculty but has weakness and rated "Satisfactory" in Laboratory and Equipment, Library, Student Services and Physical Plant & Facilities. Most graduates were employed in non-agricultural sectors. Only skills on preparatory subjects were often applied and those in general agriculture, basic and professional engineering subjects were seldom applied. The graduates claimed that they are satisfied in their job which the same were confirmed by the employers. Conclusion points that the program needs further enhancement giving priority in areas such as Laboratory and Equipment, Library, Student Services and Physical Plant & Facilities.

Keywords: tracer study, standards of excellence; knowledge/skills application; job satisfaction

1. Introduction

Program evaluation and assessment as a unique feature of school management has a critical role amidst globalization phenomenon, when the learning institution faces the pressing demands of change. New knowledge and skills are needed by a branded competent graduate to cope with the ever-changing work standards of employment. Effective educational program boosts the graduate's job performance, increases the demand of their services and maximizes their participation in the economic process. The conduct of tracer study of graduates is a modern practice adopted by visionary education managers. It is within the concept of quality assurance in education embracing a continuous process of evaluation. Surveys of graduates from institutions of higher education are utilized in the assessment of output of the school to gain systematic information and feedback from the alumni (Schomburg and Sawyer, 2003). This study is an assessment of the Bachelor of Science in Agricultural Engineering Program of the Romblon State University conducted by means of tracer study of the graduates who have finished the course and provided essential feedback to the University on the effectiveness of the program in ensuring application to job of their knowledge and skills and their job satisfaction.

2. Objectives

The objective of the study is to look into the following: (1) quality level of the Bachelor of Science in Agricultural

Engineering Program as regards standards of excellence in terms of VMGO, Faculty, Curriculum & Instruction, Student Services, Research & Extension Services, Library, Laboratories and Equipment, Physical Plant and Facilities and Administration; (2) level of application to the job of the graduates' knowledge and skills in terms of the subjects in the Preparatory, Fundamental Agriculture, Basic Engineering, and Professional Agricultural Engineering; (3) level of job satisfaction of the graduates with the work environment as perceived by the employers and the graduates themselves in terms of work condition, salaries and benefits, career growth opportunities and relevance of the course to the job; (4) strengths and weaknesses of the BSAgEn Program as regards standards of excellence, application to the job of knowledge and skills and job satisfaction; and (5) significant difference that may exist between the perceptions of the respondents.

3. Hypotheses

The study was guided by the following null hypotheses:

- 1. The graduates and the school officials have the same perceptions on the quality level of the BSAgEn Program as regards the standards of excellence.
- 2. The graduates and the employers have the same perceptions on the graduates' level of application of the knowledge and skills to the job.
- 3. The graduates and the employers have the same perceptions on the graduates' level of job satisfaction with the work environment.

4. Conceptual Framework

Programs offered by learning institutions can be assessed in terms of both the internal indicators such as quality of teaching, adequacy of facilities, relevant course programs and policies; and external indicators such as employability and job satisfaction of graduates in the field of employment (Schomburg, 2001). Stakeholders' feedbacks on these factors form essential inputs to uphold program relevance amidst demands of change. In the conduct of this study, Herzberg's Two-Factor Theory was considered to account on the graduates' job satisfaction as they apply the knowledge and skills to their work. The tracer study of Bachelor of Science in Chemistry Graduates by Santos (2004) used this theory to measure the job satisfaction among graduates of the program in Adamson University. In several tracer studies, Schomburg & Sawyer, (2003) employed the same theory in analyzing job satisfaction of the graduates in several African universities. Herzberg argued that factors related to the external environment of the work are hygiene factors; while factors related to the work itself are motivators. This theory holds that both work environment and the work itself influence job satisfaction of the graduate-employees, which is one of the indicators of an effective course program.

Also, theoretical support to this study is the *Range of Affect Theory* by Edwin A. Locke, which premised that satisfaction is determined by a discrepancy between what a person wants in a job and what he has in a job. In this study, the theory sustains that in applying the graduates' knowledge and skills, their satisfaction depends on whether or not their expectations relative to their work are met, thus reflect the framework of the study.



Figure 1. The Conceptual Framework

5. Methodology

The descriptive development research design was used to determine the status of the BSAgEn Program as regards standards of excellence, the application to the job of the graduates' knowledge and skills, likewise the job satisfaction level to develop a management enhancement program. The study was conducted at Romblon State University (RSU) in Romblon, Philippines. However, other places wherever the graduates are employed were included in the conduct of this research. RSU is geographically located at the central part of Tablas Island. It caters services to the people of Romblon and students of nearby places like Mindoro, Batangas, Aklan, and Antique. The university has been the venue of several class reunions when the graduates share experiences especially about their present employment. The government and non-government establishments scattered over the seven islands serve as the workplaces of most RSU graduates – thus the setting of the study.



Figure 2. Romblon State University is Located Near the Center of the Philippine Archipelago

A total of 265 respondents were the population of the study. From 216 BSAgEn graduates (SY 1990-2009), a sample size of one hundred twenty-four (124) graduates was determined as participants. One hundred nineteen (119) employers and twenty-two (22) members of the school top management validated the feedbacks of the graduates. Stratified random sampling was observed in selecting the participants; however, the sample respondents for the study depended on the availability of alumni's track records and addresses. Complete enumeration was done for the eight (8) faculty-respondents and fourteen (14) school top officials. Three sets of validated instruments were used to gather the data; one for the alumni, one for the employers and another for the school officials. These were given to the participants personally by the researcher, some were sent via mail, e-mail, and fax machine whichever is applicable. The administered instruments obtained a retrieval rate of 86.7 percent. Data analysis was through software on Statistical Package for Social Research, (SPSS 11.5).

6. Results and Discussion

6.1 On Standards of Excellence of Bachelor of Science in Agricultural Engineering Program

Table 1 gives the status of the BSAgEn program perceived by the school top management and the graduates as regards the standards of excellence in the nine areas. When ranked accordingly from highest to lowest, the program strengths are in terms of VMGO, Administration, Curriculum & Instruction and Faculty; while the weaknesses are in Laboratory and Equipment, Library, Student Services and Physical Plant & Facilities has an over-all mean of 3.60 marked as "Very Satisfactory".

Table 1. Status of the BSAgEn Program Perceived by the School Top Management and the Graduates as Regards the Standards of Excellence

	A 1000	School Mgt	Тор	Gradu	iates		Average	Rank
	Area	Mean	VI	Mean	VI	Mean	VI	_
1	VMGO	4.25	VS	3.82	VS	3.89	Very Satisfactory	1
2	Faculty	4.05	VS	3.70	VS	3.75	Very Satisfactory	4
3	Curriculum/ Instruction	4.24	VS	3.80	VS	3.87	Very Satisfactory	3
4	Laboratory & Equipment	2.99	S	3.33	S	3.04	Satisfactory	9
5	Research & Extension Servi	ices 3.87	VS	3.58	VS	3.62	Very Satisfactory	5
6	Library	3.24	S	3.64	VS	3.30	Satisfactory	8
7	Student Services	3.43	S	3.76	VS	3.38	Satisfactory	7
8	Physical Plant and Facilities	3.61	VS	3.62	VS	3.61	Very Satisfactory	6
9	Administration	3.83	VS	4.14	VS	3.88	Very Satisfactory	2
	Total	3.88	VS	3.56	VS	3.60	Very Satisfactory	
	Legend:	Scale Interval	Verbal	Interpreta	tion (VI))		
	4.51-5.00	Outstanding (O)		_				
	3.51-4.50	Very Satisfactor	y (VS)					
	2.51-3.50	Satisfactory (S)						
	1.51-2.50	Fair (F)						
	1.00-1.50	Poor (P)						

The respondents' assessment reflects an average of 3.60 which gives a gap of 1.4 from 5.0 to attain **Total Quality Standard** (TQS) of excellence. The existing gaps are management concerns which need to be addressed. Apparently, there is a need for the management and leadership of the university to give priority attention on the areas with "Satisfactory" quality level particularly "Laboratory and Equipment", "Library" and "Student Services".

6.2 On Comparison between Perceptions as Regards the Quality of BSAgEn Program

The comparison between perceptions of the school top management and the graduates on the quality of the BSAgEn program as regards the standards of excellence is reflected in Table 2.

			Std.	Mean				Interpre-	
Indicators	Participant	Mean	Dev.	Diff	df	t-value	p-value	tation	
1. VMGO	Graduate	3.82	0.56	0.42	144	3.37	0.001	Significant	
1. VMGO	Sch. Top Mgt	4.25	0.46	0.42	144		0.001	Significant	
2 Escultu	Graduate	3.70	0.57	0.25	144	2.67	0.008	Gionificant	
2. Faculty	Sch. Top Mgt	4.05	0.43	0.35	144		0.008	Significant	
3. Curriculum/	Graduate	3.80	0.60	0.42	144	3.12	0.002	Significant	
Instruction	Sch. Top Mgt	4.24	0.60	0.43	0.43 144		0.002	Significant	
4. Laboratory &	Graduate	2.99	0.76	0.34	144	1.95	0.053	Not	
Equipment	Sch. Top Mgt	3.33	0.74	0.54	144	1.95	0.055	Significant	
5. Community	Graduate	3.58	0.57	0.30	144	2.14	0.034	Significant	
Ext. Service	Sch. Top Mgt	3.87	0.77	0.50	144	2.14	0.034	Significant	
(Lihaam	Graduate	3.24	0.67	0.40	144	2.49	0.014	Cianificant	
6. Library	Sch. Top Mgt	3.64	0.76	0.40			0.014	Significant	
7. Student	Graduate	3.43	0.70	0.33	22 144	4 2.06	0.042	Gionificant	
Services	Sch. Top Mgt	3.76	0.68	0.55	144	2.06	0.042	Significant	
8. Physical Plant	Graduate	3.61	0.66	0.01	144	0.075	0.94	Not	
and Facilities	Sch. Top Mgt	3.62	0.77	0.01	144	0.075	0.94	Significant	
9. Administration	Graduate	3.83	0.68	0.20	144	1 09	0.049	Cignificant	
9. Administration	Sch. Top Mgt	4.14	0.49	0.30	144	1.98	0.049	Significant	
Over all	Graduate	3.56	0.54	0.22	144	2.57	0.011	Cignificant	
Over-all	Sch. Top Mgt	3.88	0.55	0.32	144	2.57	0.011	Significant	
Legend: p-value	Interpretatio	on							

Table 2. Comparison between the Perceptions of the Respondents on the Quality of the BSAgEn Program as

 Regards the Standards of Excellence

 ≥ 0.05 Not significant

< 0.05 Significant

The over-all difference between the mean perceptions of the graduates and the school top management is significant thus, the null hypothesis is rejected. The data indicate that there is a discrepancy of views between the school top management and the graduates in terms of the status of the BSAgEn program with regards to the standards of excellence. The school top management perceives the status of the program as Very Satisfactory whereas the graduates perceive it not. This may imply that there are inconsistencies of management practices in the implementation and monitoring of the program such that the true concerns of the graduate-employees during their stay in the University were not conveyed clearly to the school top management.

6.3 On the Graduates' Level of Application of Knowledge and Skills

Table 3 shows the level of application to the job of the graduates' knowledge and technical skills.

2.51-3.50

1.51-2.50

0.51-1.50

		Emplo	yer	Graduates		Average		- Daula
	Subject Area	Mean	VI	Mean	VI	Mean	VI	– Rank
1	Preparatory Subjects	2.57	OA	2.63	OA	2.60	Often Applied	1
2	Fundamental Agriculture	2.09	SA	2.18	SA	2.14	Seldom Applied	3
3	Basic Engineering	2.27	SA	2.33	SA	2.30	Seldom Applied	2
4	Professional Agricultural Engineering	2.04	SA	2.18	SA	2.11	Seldom Applied	4
То	tal	2.24	SA	2.33	SA	2.29	Seldom Applied	
	Legend: Rating s 3.51-4.00 Very off	cale Ver en applied (V		pretation ((VI)			

Table 3. Level of Application to the Job of the Graduates' Knowledge and Technical Skills as Perceived by the Employers and the Graduates Themselves

When the areas are ranked accordingly from highest to lowest, the strengths are in "Preparatory Subjects" and "Basic Engineering" and the weaknesses are in Professional Agricultural Engineering and Fundamental Agriculture. It reflects that only preparatory subjects were often applied to the job. From the over-all mean of 2.29, there is a gap of 1.71 towards Total Quality Standards in implementing the program in terms of application to the job of the knowledge/skills. In the interviews conducted to validate the result, the researcher noted that several of the graduates were employed in non-agricultural sectors. This phenomenon seems to be the reason why most of the knowledge and skills were seldom utilized in the job.

6.4 On Comparison between Perceptions as Regards Level of Application to the Job of the Knowledge and Skills

Often applied (OA)

Seldom applied (SA)

Never applied (NA)

The comparison between respondents' perceptions on the level of application to the job of the knowledge/skills is shown in Table 4. It shows no significant difference between the over-all mean perceptions of the employers and the graduate-employees, so the null hypothesis is accepted. Both groups of respondents agreed that the knowledge and skills were seldom applied to the current job of the graduate-employees.

Indicators	Participant	Mean	Std. Dev.	Mean Diff	df	t-value	p-value	Interpretation
				DIII	ui	t-value	p-value	Interpretation
Preparatory	Graduate	2.63	0.70	0.06	241	0.66	0.512	Not Significant
Subjects	Employer	2.57	0.78					
Fundamental	Graduate	2.18	1.05	0.08	241	0.65	0.516	Not Significant
Agriculture	Employer	2.09	0.98					
Basic	Graduate	2.33	0.84	0.06	241	0.52	0.604	Not Significant
Engineering	Employer	2.27	0.88					ivot Significant
Professional	Graduate	2.18	0.95	0.14	241	1.16	0.248	Not Significant
Agricultural Engineering	Employer	2.04	0.88					
	Graduate	2.33	0.82	0.00	• • •		0.405	Not Significant
Over-all	Employer	2.24	0.77	0.09	241	0.83		
Legend: P-value	Int	erpretation	n					
≥ 0.05	5 No	t significa	nt					

 Table 4. Comparison between Perceptions of the Respondents on the Level of Application of the Knowledge/Skills

 at 5% Level of Significance

< 0.05

Significant

6.5 On the Graduates' Level of Job Satisfaction with the Work Environment

The graduates' level of job satisfaction with the work environment is presented in Table 5. When arranged from highest to lowest, the strengths are in terms of "Work condition" and "Career growth opportunities" and the weaknesses are in terms of "Relevance of the course to the job" and "Salaries and benefits". The data reflect a total mean is 3.06 with a gap of 0.94 towards total quality standard. The gaps may have been due to employment in non-agricultural sectors as noted earlier.

Table 5. Graduates' Level of Job Satisfaction with the Work Environment

	Indicators –		Employ	er	Gradu	ate	Av	erage	Rank
	mulcators			VI	Mean	VI	Mean	VI	
1	Work Condition		3.19	S	3.20	S	3.20	Satisfied	1
2	Salaries and Benefits		3.18	S	3.10	S	3.14	Satisfied	3
3	3 Career Growth Opportunities		3.20	S	3.13	S	3.17	Satisfied	2
4	4 Relevance of the Course to the Job		2.72	S	2.74	S	2.73	Satisfied	4
	Total		3.07	S	3.04	S	3.06	Satisfied	
	Legend: Rating sca			Verb	al Interpreta	tion (VI)			
	3.51-4.00	Highly sat	isfied (HS)						
	2.51-3.50	Satisfied (S)						
	1.51-2.50	Fairly satis	sfied (FS)						

6.6 On Comparison between Perceptions on the Level of Job Satisfaction with the Work Environment

Not satisfied (NS)

Table 5 presents the comparison between the perceptions of the respondents on the level of job satisfaction with the work environment. It can be gleaned from the table that the over-all mean difference (MD= 0.032) between the perceptions of the graduates and the employers is not significant (p = 0.629), therefore the above null hypothesis is accepted. Both groups of respondents perceived that the graduate-employees are satisfied in their job.

Table 6. Comparison between the Perceptions of the Employers and the Graduates on the Level of Job Satisfaction at 5% Level of Significance

Indiastans	Dautiain ant	Maan	Std.	Mean	36	4		Indonesiado
Indicators	Participant	Mean	Dev.	Diff	df	t-value	p-value	Interpretation
Work Condition	Graduate	3.20	0.54	0.002	241	0.03	0.975	Not Significant
WOIK COllution	Employer	3.19	0.59			0.05	0.975	Not Significant
Salaries and	Graduate	3.10	0.64	0.075	241	0.91	0.362	Not Significant
Benefits	Employer	3.18	0.65					
Career Growth	Graduate	3.13	0.63	0.073	241	0.91	0.362	Not Cionificant
Opportunities	Employer	3.20	0.61					Not Significant
Relevance of	Graduate	2.74	2.74					
the Course to	F 1	2.72	0.70	0.017	241	0.16	0.870	Not Significant
the Job	Employer	2.72	2.72					C
0 "	Graduate	3.04	0.53	0.020			0. (00	
Over-all	Employer	3.07	0.51	0.032	241	0.48	0.629	Not Significant
Legend: P-val	ue Interpr	etation						
≥ 0	.05 Not si	ignificant						

< 0.05

0.51-1.50

Significant

7. Findings

7.1 On Quality of the BSAgEn Program as Regards the Standards of Excellence

The program reflected a "Very Satisfactory" quality level in 1) VMGO, 2) Administration, 3) Curriculum and Instruction, 4) Faculty, 5) Research & Extension Services and 6) Physical Plant and Facilities while "Satisfactory" quality level in 1) Student Services, 2) Library and 3) Laboratory and Equipment. The highest rating was in

"VMGO" and the lowest rating was in "Laboratory and Equipment".

7.2 On the Strengths and Weaknesses of the Program as Regards Standards of Excellence

The major strengths of the program are in terms of (1) Faculty members' mastery of their fields of specialization, (2) Proper observance of course pre-requisites,(3) Awareness of the needs and problems of the community, (4) Competence of the head librarian, (5) Very accessible office of the guidance counselor, (6) Accessibility of the institution by all types of transportation, (7) Highly qualified dean and department heads (8) Very reasonable tuition fees (9) Students' participation in faculty evaluation and (10) Well designed and properly accredited curriculum. The major weaknesses are in terms of (1) Harmony between the educational practices and program objectives, (2) The average 35 students class size, (3) Info-technology, and laboratory facilities, (4) Textbooks and references as well as audio-visual materials in the library, (5) Housing facilities and security services, (6) Janitorial/ maintenance staff services (7) Admission and retention policies of the Department, (8) Laboratory technician/helper for the upkeep of the laboratories and (9) Adequacy of equipment, apparatuses and laboratories for hands-on activities.

7.3 On Comparison of Perceptions on the Quality of BSAgEn Program

The difference in perceptions between the school top management and the graduate-employees was significant. The school top management perceived the status of the program as Very Satisfactory whereas the graduates perceived it not.

7.4 On the Level of Application of the Agricultural Engineering Knowledge and Skills

The graduates assessed the knowledge and skills in Preparatory Subjects as "*Often applied*" to the job, but the knowledge and skills in Fundamental Agriculture, Basic Engineering and Professional Agricultural Engineering subjects were assessed as "*Seldom applied*" to the current job.

7.5 On Strengths and Weaknesses of the Program in terms of Application of Knowledge and Technical Skills

The stakeholders perceived major strengths of the program on: (1) Graduates' very effective skills in the application of computers and information technology, (2) Graduates' knowledge and skills applied in investigative aspects of agriculture, (3) Graduates' versatility and hard-working abilities, (4) Graduates' skills in conceptualizing integrated agricultural projects, and (5) Graduates' very good skills in mathematical computations.

The weaknesses of the program were on: (1) The non-relevance of knowledge and skills to the current job, (2) The difficulty in using English communication skills of the graduates (3) The little application of professional agricultural engineering know-how, and. (4) The employment in non-agricultural sectors of most of the graduates.

7.6 On Comparison of Perceptions on the Application of Knowledge and Skills

There was no difference in perceptions among respondents with regards to the application to the job of the knowledge and skills of the graduates. Both the graduates and employers perceived that the knowledge and skills in Preparatory subjects were often applied while that in Fundamental Agriculture, Basic Engineering and Professional subjects were seldom applied to the job.

7.7 On the Graduates' Level of Job Satisfaction with the Work Environment

The graduate described themselves as "Satisfied" with the work environment as regards Work Condition, Career Growth Opportunities, Salaries and Benefits and Relevance of the Course to the Job.

7.8 On Strengths and Weaknesses of the Program in Terms of Graduates' Job Satisfaction with the Work Environment

The perceived strengths of the program were noted in terms of (1) Very good work condition, (2) Policies on job security and safety, (3) Good career growth opportunities, and (4) Subsidies and other benefits given; while the weaknesses were in terms of (1) The knowledge and skills not relevant to the present job, (2) Limited skills applicable to the actual work, and (3) Promotions usually influenced by politicians.

7.9 On Comparison between Perceptions on the Graduates' Job Satisfaction with the Work Environment

There was no significant difference in perceptions of the respondents in terms of job satisfaction with the (1) Work condition, (2) Salaries and benefits, (3) Career growth opportunities and (4) Relevance of the course to the job. Both graduates and employees affirmed that the graduates are satisfied with the work environment.

8. Conclusion

The conclusions are the following:

- 1. The BSAgEn program is *Very Satisfactory* in terms of the standards of excellence and can be further enhanced in all areas considering priority attention in Student Services, Library and Laboratory & Equipment.
- 2. The program is strong in terms of VMGO, administration, curriculum and instruction and faculty, but weak as regards info-tech instructional practices, student services, library, as well as equipment and laboratories.
- 3. There is significant difference in perceptions between the school top management and the graduates on the status of the BSagEn program due to lack of coordination in the implementation of the program.
- 4. The knowledge and skills in Preparatory Subjects are "*Often applied*" to the job while that in Fundamental Agriculture, Basic Engineering and Professional Agricultural Engineering subjects are "*Seldom applied*" because many are employed in non-agricultural sectors.
- 5. The graduates are very good in computer applications and mathematical computations, skillful in making integrated agricultural projects and versatile in the work field; but showed difficulty in using the English language, and in making agriculture-related software.
- 6. The graduates are "Satisfied" with the work environment in terms of Work Condition, Career Growth Opportunities, Salaries and Benefits and Relevance of the Course to the Job.
- 7. The strengths of the program as regards graduates' job satisfaction are in terms of very good work condition, attractive career growth opportunities, compensating salaries and benefits, and policies on job security and safety; while the weaknesses are in terms of limited skills related to actual work, promotions usually influenced by politicians and irrelevance of the course to the present job.
- 8. There is no significant difference in perceptions of the employers and graduates on the level of application of knowledge/skills as well as graduates' level of job satisfaction with the work environment.

9. Recommendation

In the light of the findings and conclusions of the study, the following are the recommendations:

- 1. The management staff of the university may give priority attention and effort to enhance the program areas especially those with relatively low quality level like Laboratories & Equipment, Library and Student Services.
- 2. The administrative leadership of the school can revisit the monitoring practices in the implementation of the program to have common points of views during program assessment among stakeholders.
- 3. The curriculum and instruction elements of the program could make intervention to address the graduates' difficulty in communication skills and the use of new technology package in agriculture.
- 4. The school can create a job placement unit to cater services for proper employment among the graduates of the university.
- 5. The leadership of the school may sustain the accreditation of its various program offerings towards total quality standards of management.
- 6. The researcher strongly recommends the consideration of the proposed Management Enhancement Program for BSAgEn in offering the course to address the stakeholders' feedback in this study.
- 7. Similar study can be conducted considering other courses offered in the University to form systematic track records and job placement of all the graduates.

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