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THE PROGGRESSES OF THE QUALITY IMPROVEMENT IN AGROINDUSTRIAL TECHNOLOGY STUDY PROGRAM BOGOR AGRICULTURAL UNIVERSITY

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SUMMARY

The Agroindustrial study program of the Department of Agroindustrial Technology is committed to pursue the achievement of ATSP vision to become an outstanding higher learning institution producing manpower for establishment of international class agroindustries in Indonesia. The QUE Project function is as an accelerator in the process of achieving the vision through the *Tri Dharma* mission.

The objectives and strategy formulated as well as the implemented activities are based on the SWOT analysis through self-evaluation. The objectives of ATSP are to produce qualified graduates having competitive skills, responsible, innovative, and strongly motivated to develop agro industry; to provide research and development; and to disseminate them in the fields of process technology and agro industrial engineering and management. In order to achieve these objectives, ATSP has been implementing integrated activities to improve (1) relevance, (2) academic atmosphere, (3) internal management and organization, (4) sustainability, and (5) efficiency and productivity of ATSP.

The QUE activities include: 1) curriculum development, 2) co-curricular activities intensification, 3) improving English proficiency, 4) academic staff development, 5) improving students technical skill, 6) linkage with industry, 7) improving student/staff research and publication, 8) improving students involvement in scientific competitions, 9) improvement of existing teaching industry, 10) improving student final project arrangement, 11) improving teaching learning process, 12) improving quality of incoming students, 13) improving staff commitment and motivation, 14) improving education process management, 15) development of alumni networking, and 16) development of students parents networking.

During the first year of QUE, project implementation has been directed to achieve the expected outputs include highly competitive graduates with increased skill and scientific knowledge and highly qualified staff with improved commitment and motivation. Other important outputs consist of an improved curriculum, better education facilities, and better quality of incoming students and increased completion rate of study. The expected outcomes include better NEM score of incoming students, better GPA of graduates, shorter length of study, decreased waiting time for obtaining jobs and better English proficiency. The quality of incoming students is considered good, reflected by the relatively high average NEM score of 47 compared to that in IPB level (45). The NEM score is lower than the 1999 data. However the 1.72 decrease is still better than that of the average decrease of IPB NEM score (2.0). There is no significant improvement to GPA and length of study yet. Several implemented activities are expected to improve the GPA and shorten the length of study gradually. There is significant TOEFL score improvement from 470 to 486. The percentage of student's population having TOEFL score higher than 450 also increased from 56 to 72. The GRE score was 422.5. The achievement of the set auxiliary indicators is promising. There are 14 indicators (25%) in which the mid term targets have been achieved, 27 indicators (49%) with positive trend and 12 indicators (22%) are remaining unchanged. Only two auxiliary indicators (4%) have negative trend.

The second year QUE project implementation is focused to accelerate the achievement of the objectives and the set of performance indicators. It is expected that the mid term target can be achieved in this second year implementation. At the end of the 4-year plan implementation, it is strongly expected that ATSP becomes a strong, efficient, productive and sustainable institution in the field of Agroindustrial Technology.

A. BACKGROUND

The Agroindustrial Technology Study Program (ATSP) was formally announced to be one among 16 study programs, which received the third batch of the QUE grant by a letter from DGHE No.001/D/T/2000, dated January 3rd 2000. This Project was granted by the total budget for all activities of Rp. 1,830,974,700 and US$ 1,200,332.00. The Project Officers were appointed by Head of DAT among the staff to run the all activities based on the previous approved planning program. The staff appointed has committed to conduct each activity carefully in order to get better achievement especially in quality of undergraduate education improvement. Not only the staff involved in this Project, but also the student, the administration and laboratory technician.

According to the previous SWOT analysis results, the ATSP is challenged by the national needs to increase real contribution of agro industry to the national economy. The agro industrial development requires the availability of qualified human resources who have the capability in mastering science and technology in agro industrial sector. At present ATSP has a group of human resources, curriculum, and huge students with moderate facilities, little education funds, which affected to the limitation of education support activities.

To meet such a need, the ATSP has conducted the following activities through QUE Project, i.e. (1) Curriculum Development, (2) Intensifying Co-Curricular Activities, (3) Improving English Proficiency, (4) Academic Staff Development, (5) Improving Student's Technical Skill, (6) Improving Linkage with Industry, (7) Improving Student/Staff Research, (8) Improving Student Involvement and Scientific Competition (9) Improving Existing Teaching Industry, (10) Improving Student Project Arrangement, (11) Improving Teaching and Learning Process, (12) Improving Quality of Incoming Student, (13) Improving Staff Motivation and Commitment, (14) Improving Education Process Management, (15) Development of Alumni Networking, (16) Development of Student's Parent Networking. Most of these activities have been implemented successfully in the first years (2000-2001). Despite this success, some obstacles and constraints need to be solved in the second year of the project. A number of new programs have also been planned to be taken in this second year.

To monitor and evaluate the project, the baseline evaluation has been done, and also during the implementation of QUE Project some reports have also been produced such as monthly reports, quarterly reports and one annual report. In this paper the progress of some activities which has already been in progress will be presented. Basically, the second year QUE project implementation is focused to accelerate the achievement of the objectives and the set performance indicator.

B. VISSION, MISSION, OBJECTIVES AND STRATEGY

VISION

The vision of ATSP is to become an outstanding higher learning institution, producing manpower in the fields of process technology for agricultural product and agroindustrial engineering and management, especially for the establishment of international – class agroindustries in Indonesia.

MISSION

The mission of ATSP is to carry out education, research and public extension activities in the field of agroindustrial technology, with specific focus on (1) improving the quality of educational practices and infrastructures, (2) strengthen the link and match of university research with the other institution, (3) enhancement of extension activities with emphasis on the agroindustrial enterprises.

OBJECTIVES

The objectives of ATSP are (1) to produce qualified graduates having competitive skills, responsible, innovative and strongly motivated to develop agro industry, (2) to provide Research and Development results in the field of agro industry, (3) to disseminate and to implement the innovative breakthroughs in the fields of process technology and agroindustrial engineering and management in the real world.

STRATEGY

The grand strategy of ATSP is directed towards the fulfillment of the objectives by conducting the missions and to develop specific activities to achieve the objectives. The logical framework of the development of objectives and strategies generated from self-evaluation and SWOT analysis, were formulated into necessary programs related to improve relevance, academic atmosphere, internal management and organization, sustainability, and efficiency and productivity. Basically, the grand strategy covers the various improvement of (1) the incoming students, (2) the teaching and learning processes, (3) laboratory and the necessary facilities, (4) staff capability and commitment through academic education and trainings and staff incentives/rewards, (5) students capability in many aspects, (6) professional academic circumstances, (7) strengthening collaboration between ATSP and private sectors, (8) increasing capacities of ATSP network both domestically and internationally.

C. PERFORMANCE INDICATORS

The ATSP has proposed the QUE project in which necessary activities related to input, process and output of educational process. All activities are designed to improve (1) relevance, (2) academic atmosphere, (3) internal management and organization, (4) sustainability, and (5) efficiency and productivity of ATSP. Better educational process, which is a measure of performance of the ATSP QUE project implementation, will be measured by a set of indicators of performance target (Table 1).

To guarantee that the activities of the ATSP QUE project is on track, it is necessary to monitor the progress of each activity regularly, using a set of output indicator. Some of those indicators will be evaluated every year. It is expected that during as well as after Queer's project implementation, those indicators will be improved gradually and continuously. Following the main performance indicators, there are some auxiliary indicators which are important to indicate the performance of each activity, such as number of student involve in scientific competition, number of lecture conducted in English, number of students involve in staff research, etc.

Table 1. Performance Indicators

No	Indicator	Baseline	To date	Mid	Final
1.	♦ Average NEM Score ♦ Percentage of incoming students with NEM score more than 49	49(5) 35	47(5) 35	49 42	49 50
2	♦ Average Graduates' GPA ♦ Percentage of graduates population having GPA more than 2.75	2.9 (0.3) 66	2.9(0.3) 66	3.0 70	3.1 75
3.	♦ Average Graduates' length of study (years) ♦ Percentage of students with length of study less than 4.5 years	4.6(0.5) 50	4.6 (0.8) 52	4.5 60	4.2 80
4.	♦ Average Graduates' waiting time before getting first job (months) ♦ Percentage of graduates with waiting time more than 3 months	3.4(2.6) 44	*)	3.2 30	3.0 15
5.	♦ Average TOEFL score ♦ Percentage of students population having TOEFL score more than 450	470(65) 56	486(57) 72	480 67	490 72
6.	♦ Average GRE score	422.5	422.5	445	465

Figures in bracket represent standard deviation
*) to be collected by tracer study scheduled in the second year of implementation

D. IMPLEMENTED PROGRAM ACTIVITIES

D.1. Improving Relevance

1. Curriculum Development

The significant curriculum change has been made, for example the laboratory practices for similar subjects were integrated to be one subject. In addition, in line with the development of the study program to focus on three streamlines, namely industrial management, bio/process technology, and environmental management and technology, some new elective subjects were offered. A continuous evaluation is required to improve the curriculum in order to result high quality graduates.

This improvement is based on comments and suggestions from the students, alumni and users. Which are compiled in the workshop. The objectives of the curriculum development are to maintain good conformity of the curriculum to national and international job market, to obtain a systematic structure of the curriculum, and to reach national and international standards. All programs will be integrated with those supported by the Faculty.

2. Intensifying Co-Curricular Programs

Co-curricular programs basically are the programs that are initiated, conducted, and intended to fulfill the need of students, and relevant to the agroindustrial business and profession, and arranged by Students Association of Agroindustrial Technology as well as non-formally by student groups. It is obvious that graduate's core of competence has already been reflected from the designed academic curriculum. Intensifying co-curricular programs is intended to provide graduate with more competitive value, especially with increasing competitiveness and entrepreneurship. Successful co-curricular activities will also improve the academic atmosphere, in addition to improving relevance

The objectives of this program are (i) to broaden student's and graduate's views in agroindustrial technology development, and (ii) to increase student's and graduate's technical knowledge and skills relevant to job market requirement. The planned mechanism of conducting co-curricular programs includes discussion, stadium general, industrial field trip, and other improvement of student's skills. All of the activities should be linked with the program of faculty.

3. Improving English Proficiency

In the context of learning process, English proficiency is also critical for students since most textbooks and other lecture materials are written in English. Around 56 percent of ATSP student population has reached TOEFL score of above 450 during TOEFL like test. Further analysis of TOEFL test results revealed also that reading skill was relatively good, but writing and listening skills were needed to be improved. In the first year the average score of TOEFL was 483.7, which was greater than the target planning. Whilst the GRE score reached by 422.5 with deviation standard of 40.15.

To increase student capability in English, in the first year of QUE project ATSP had delivered an English Conversation Club and teaching in English program. The objective of the proposed programs is to improve the student and graduate's capability in English, particularly listening, writing, and speaking skills. These will expectedly improve student's TOEFL and GRE scores, which eventually leading to better fitness and readiness of graduates for competition.

Most of the proposed programs are of less capital-intensive category, therefore staff and student commitment needs to be ascertained to maintain the program sustainability.

4. Academic Staff Development

The academic staff qualification is good and improving continuously. To fulfill the need of staff in area of leather technology, packaging technology and business and industrial management, ATSP under QUE project has successfully sent three staff for each field to pursue PhD degree in the first year. Out of QUE project, one staff has also started PhD in the field of chemical technology. The project has also financed two staff to participate in international scientific meeting. The objective of academic staff development are to improve research and teaching capability, and to motivated the staff for improving graduate quality in all aspects. With Project termination, the funding required for these activities will be sought from Government of Indonesia scholarship, foreign government and private institutions.

5. Improving Student's Technical Skill

Student and graduate engineering and management skills are of particular importance in the performance of professional works. The requirement of both skills is reflected from the academic curriculum, especially through practical works. The number of existing laboratory equipment and computer units in the ATSP is not sufficient to serve 120 students/year (or equivalent to 360 students for 3 batches). In most laboratory practices, students are grouped into groups comprising 6-10 students sharing one equipment. The objectives of this activity are to increase student's technical skill through enrichment and intensification of laboratory practices, which are supported by a program of upgrade and procurement of better laboratory equipment, computer hardware and software, as well as technicians.

The mechanism and design to perform the proposed activity includes (1) setting up procedures for upgrading and procuring the needed laboratory equipment, (2) increasing number of equipment unit, student grouping for practical works can be rearranged, (3) development of equipment manual and operating procedure available for students, (4) training for technicians and students, including set up, operation, and maintenance of equipment and instrumentation.

6. Improving Linkage with Industry

In line with "link and match" program, ATSP will continuously improve and extend the quantity and quality of linkages for the benefits of students, staff and institution in general. The objectives of this activity are to intensify the current linkages between ATSP with industries and to create new linkages between ATSP with other industries. The activity will be implemented through (1) joint research and mutual business partnership, (2) application of ATSP's research products in agroindustries, (3) providing technical and managerial assistantship and consultancy, (4) Establishing procedure for developing the Industrial Oriented Education System (IOES) (5) involving ATSP alumni to help ATSP in the promotion to industry. Once the mutual benefit is established, it is expected that the continuity of collaboration be ensured.

D.2. Improving Academic Atmosphere

1. Improving student/staff research and publication

The number and quality of student/staff research and publication is one of the principal indicators of the quality of academic atmosphere. The implementation of this activity is expected to improve the interaction between staff and students outside class and among staff. The general objectives of the project are to improve the quality and activity of research conducted and scientific publications produced by the ATSP's staff and students. The intended outcome is high quality staff and graduates in performing research and publishing their research results in refereed journals and scientific meeting.

The activity will be set up through the implementation of (1) improving access to the laboratory facilities, (2) enhancing the submission of research proposals to funding agencies and promoters of a collaboration, (3) encouraging and facilitating staff and students to publish their research results in refereed journals and scientific meetings, (4) provision of updated references and improving library facilities, (5) improving the involvement of students in staff research projects. All programs related to this activity will be performed with maximum support from the available resources. ATSP feels confident to maintain and improve this activity for the following reasons: (1) the number of competitive research grants obtained by staff during the first year implementation, (2) possible access to the lab facilities of other institutions, and (3) collaborative research with the other research institutions conducted by the ATSP, (4) accredited scientific journal.

2. Improving student involvement in scientific competitions

1. Competitive programs such as LKTI (scientific writing competition), LKIP (innovative and productive research competition), and national outstanding student competition have has always received great attention by students. In respect to the need of increasing the number of students participating in scientific competitions. ATSP is developing some programs to increase student motivation and scientific skill. The objective is to improve student involvement in scientific competitions, and to improve students' skill in formulating creative ideas in the form of research activities. The activity is conducting by supervising a group of students, conducting workshop and facilitating them to the propose activities

D. 3. Improving Efficiency and Productivity

1. Improvement of Existing Teaching Industry

Up to now, the facility of the pilot plant/existing teaching industry consisted of a set of agroindustrial product processing lines, such as sugar, tea, oil, tapioca, and tofu. These facilities are used to support education (laboratory practices), research and development as well as training. Although some of the facilities have been repaired, some other of the processing line equipment units are still in need for repairing and modification. Upgrading of these facilities will optimize their utilization as a teaching industry. The objective of the improvement of the existing Teaching Industry is to improve student's engineering and management skills by enriching a hand-on practice in actual agroindustrial processes in a large enough production scale for commercial run. The Teaching Industry can also provide working place to conduct research topics for student's final project (*skripsi*), and hence giving a positive contribution in reducing the length of study.

2. Improving Student Final Project Arrangement

The prolonged study duration leads to student accumulation, and therefore reduces the ratio of facility to student served. A number of causes have been identified. These include excessive scope and depth of final project, prolonged research proposal preparation, difficulty in finding research projects, limited research facility and the need for more intensive supervision

To overcome the obstacle it is necessary to intensify communication between student and staff, so that the staff and student research can be harmonized in contact of research preparation and execution. Socialization of the TQM program to heads of laboratory, staff member, as well as to students should be intensified to increase the number of quality control circles both in the levels of supervision and laboratory.

The objective of this activity is mainly to reduce the duration of skripsi and study. The mechanisms are (1) implementing the new set of criteria for reviewing student's final research proposal, (2) conducting the adjusted course subject academic writing and presentation methods in semester VII, (3) intensifying the integration of student's final project into staff's research, (4) developing more linkages and collaborative works with other institutions

3. Improving Teaching and Learning Process

An important issue pertinent to successful student's learning process is related to size of class. There are two options available for solving the problem, namely reducing class size and improving facility and condition of classrooms. The objective of this activity is to improve student's learning process and staff teaching process by producing lecture notes and laboratory manuals relevant to the ATSP curriculum, reducing class size and providing better classroom facility, developing GBPP of all courses offered, as well as providing better counseling services.

The mechanisms are by (1) updating the existing lecture notes and laboratory manuals (2) developing new lecture notes and laboratory manuals, (3) extending the implementation of parallel classes for subjects involving greater than 100 students, (4) improving classroom facility, especially for the existing two large capacity classrooms, (5) updating and completion GBPP to all courses offered, (6) training for improvement of staff teaching capabilities, (7) intensifying student counseling services through a regular meeting.

4. Improving Quality of Incoming Students

Increasing number and quality of the applicants will provide an opportunity for ATSP to select the best candidates to be accepted to ATSP. High quality of incoming students will make better learning activities and better output. To achieve this, it is important for ATSP to promote itself to the high schools students all over Indonesia by providing leaflet/brochure or setting up home page accessible through Internet. The objective of this activity is to increase the number and quality of applicants to enable ATSP and to select more the high quality of incoming students to ATSP based on merit. This activity will be maintained in cooperation with agroindustries, ATSP students association and alumni.

5. Improving Staff Commitment and Motivation

The ATSP needs to improve staff commitment and motivation by providing an appropriate reward system, in addition to create a conducive academic atmosphere. The reward given may be in the form of incentives for performing staff (teaching grants, project grants, and awards for development of lecture notes and laboratory manuals), award for the best-committed staff (*dosen teladan*) or acknowledgment given through seminar, etc.

The objective of this activity is to improve staff commitment and motivation. In addition, this activity can also improve the internal management and organization. The criteria and procedures of the grants and award will be completed and evaluate before the announcement of the competitions by discussion with all the ATSP staffs.

Besides the competition provided by QUE program, the ATSP staffs should be motivated to participate in other established research grants or make research cooperation with private company in accordance to the performance of IPB campus autonomy.

For sustainability purpose, this activity is organized with the private companies. The award is named as the name of the company, which provides the award. Well performed project/policy study grants could be followed up with participation to the other established research grant such as Competitive Research Grant (*Hibah Bersaing*), Integrated Research Grant (RUT), URGE or Internationally funded research grant, and by collaborating with users of the research output or other research institutions.