The Executive Summary Report on Quality Assurance for The Academic Year 2009

Quality Assurance Subdivision

Division of Academic Support
Suranaree University of Technology

Preface

This Self Assessment Report is compiled for the purpose of reporting and analyzing the implementation results of Suranaree University of Technology during the academic year 2009 (May 2009-April 2010) by using the educational quality assurance' indicators and criteria set by the Office of the Higher Education Commission (OHEC). This report is intended for SUT and its stakeholders, especially the supervisory board, and the public in order to develop quality and educational standards of the university into a higher level.

Suranaree University of Technology has established a policy on continuous educational assessment to create a quality corporate culture within SUT beginning with educational quality assurance since the academic year 1998, with the system and mechanism for educational quality assurance corresponding well to the university policy of "Centralized Services Coordinated Missions". The educational quality assurance have been improved and revised continuously up until 2006. In 2007, OHEC set forth higher educational standards for internal quality assurance and SUT has used them as the main standards in its quality assessment aiming to become a university that emphasizes on producing graduates and undertaking research. SUT has adjusted the indicators following the OHEC indicator development using all the OHEC indicators, and incorporated the SUT 5 indicators making it a total of 9 components with 46 indicators. In addition, the report has included data related to the indicators for the second round of External Quality Assurance conducted by Office for National Education standards and Quality Assessment (Public Organization, ONESQA) for data follow-up and implementation. In the academic year 2008, SUT re-adjusted its quality assurance indicators adding the component in the mission of technology adaptation, transfer, and development. This is the tenth component which consists of 4 indicators making it a total of 10 components with 50 indicators. Since the academic year 2009, SUT has incorporated the component in the institutional policy 3D (Democracy, Decency, Drug-free) which comprises of 2 indicators making it a total of 11 components with 52 indicators. Moreover, SUT has collected data and facts concerning ONESQA indicators to integrate both the internal and external quality assessment, and to save them as additional data for the next round of ONESQA as well.

To implement PDCA in the academic year 2009, SUT arranged educational quality assurance by external assessment committee during August 9-11, 2000, and in September 2000, the university organized the QA Forum to brainstorm, exchange ideas, and develop mutual understanding and awareness on educational quality assurance. From these activities, the university has taken the appraisal results in determining SUT policy in order to strengthen its distinctive features, and, based on the indicators, correct those features lacking behind, and in creating a strategic plan for the university. Moreover, individual work units of SUT have used the results of self-assessment and quality assessment inspections of work units for their benefits. In case of weak points, the work unit has developed a plan to improve the implementation results by assigning a certain person a clear-cut responsibility, and by putting them in plans of actions, and relevant projects/activities in order to develop the unit, and to propose for the budget in the next fiscal year leading to concrete implementation and optimal achievement, which in turn will improve and develop the quality of educational management into a more efficient, effective, and continuous manner.

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(Professor Dr. Prasart Suebka)

Rector

Suranaree University of Technology

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The Report on Quality Assurance for Academic Year 2009

Executive Summary

Suranaree University of Technology (SUT) is Thailand first autonomous, non-bureaucratic university in the form of "a government-supervised university". The university primarily focuses on teaching-learning activities and research in science and technology necessary for the national development, and takes a stand on administrative principle of "Centralized Services Coordinated Missions". The university has implemented educational quality assurance continuously since the academic year 1998. In the academic year 2007, the university adjusted the indicators to make it consistent with the indicators set by the Office of the Higher Education Commission (OHEC) for being a graduate production and research-oriented university. The university employs 9 OHEC components and 41 indicators (except the indicators for a university group of a graduate production and social development, and the indicator for a graduate production and art and cultural development), including 5 SUT indicators, making a total of 9 components and 46 indicators. In the academic year 2008, the university re-adjusted the quality assurance indicators by adding 4 indicators for technology adaptation, transfer and development mission, making it a total of 10 components and 50 indicators. As for the academic year 2009 (May 2009-April 2010) the university included 2 indicators based on a component for academic institution policy 3D (3D), making it a total of 11 components and 52 indicators as follows:

1. **Component 1**   Philosophy, Commitments, Objectives, and Implementation Plans (2 indicators)
2. **Component 2**   Teaching and Learning (16 indicators)
3. **Component 3**   Student Development Activities (2 indicators)
4. **Component 4**   Research (6 indicators)
5. **Component 5**   Academic Services to the community (4 indicators)
6. **Component 6**   Preservation of Art and Cultural Promotion (1 indicator)
7. **Component 7**   Administration and Management (10 indicators)
8. **Component 8**   Finance and Budgeting (2 indicators)
9. **Component 9**   System and Mechanism for Quality Assurance (3 indicators)
10. **Component 10**   Government's Educational Policy "Academic Institution 3D (3D)" (2 indicators)

11. Component 11   Technology Adaptation Transfer and Development
(4 indicators)

The university has implemented educational quality assurance with details of components, indicators, and level of appraisal results for each indicator presented in Chapter 2. Chapter 3 provides a summary of strengths/ suggestions and weaknesses/ solutions of the university. According to these chapters, the university's perspective can be concluded as follows:

Overall Results of Educational Quality Assessment

1. The implementation results of the university were rated "very good" level, obtaining the average of 2.85 from the full score of 3 points by the OHEC indicators, which was 95%. (with 35 out of 41 indicators meeting the standards), and the average of 2.76 from the full score of 3 points by the combination of OHEC and SUT indicators, which was 92% (with 45 out of the total 54 indicators meeting the standards).

2. The appraisal results based on 52 indicators indicated that 44 indicators were rated standard level (full score of 3 points) or were classified as distinctive features. These 44 indicators are as follows:
   1) **Indicator 1.1**   An identification of philosophy or vision followed by strategies, implementation plans. Indicators should be set up to observe the progress of these plans.

   2) **Indicator 1.2**   The percentage of attaining indicators stated for each plan.

   3) **Indicator 2.2**   A learning process that emphasizes on learner.

   4) **Indicator 2.3**   Projects or activities to support the curriculum development and learning process alls individual, organization and external community to participate.

5) **Indicator 2.5**   The proportion of the number of full-time faculty holding bachelor, master, and doctoral degrees or equivalent to the number of full-time faculty.

6) **Indicator 2.7**   A mechanism to promote the ethical professional practices among faculty.

7) **Indicator 2.8**   A mechanism to promote research for teaching and learning development among full-time faculty.

8) **Indicator 2.9**   Percentage of bachelor graduates who can secure jobs and can be self employed within one year.

9) **Indicator 2.10**   Percentage of bachelor graduates receiving starting salaries in accord with the standardized scale.

10) **Indicator 2.11**   Level of satisfaction of employers business operators and graduate users.

11) **Indicator 2.12**   The percentage of students or alumni who have graduated within 5 years who are granted award in term of academic, professional, morality, ethics, sport, health, art and culture, or environment at the national or international level.

12) **Indicator 2.13**   The percentage of full-time faculties who are really function as thesis advisors in proportion to the number of those who are qualified. (only for institutions that emphasize on producing graduates and research)

13) **Indicator 3.1**   Services offered to students and alumni.

14) **Indicator 3.2**   Supports for student activities that are complete and conform to preferred characteristics of graduates.

15) **Indicator 4.1**   A development of systems and mechanisms to support the conduct of research and innovations.

16) **Indicator 4.2**   A knowledge management system for research and innovations

17) **Indicator 4.3**   The amount of internal and external grants for research and innovations in proportion to the number of full-time faculty.

18) **Indicator 4.4**   The percentage of research and innovations published or registered as intellectual property or patented or utilized at the national or international level in proportion to the number of full-time faculty.

19) **Indicator 4.5**   The percentage of research articles cited in the referred journals, or national or international databases in proportion to the number of full-time faculty. (only for institutions that emphasize on producing graduates and research)

20) **Indicator 4.6**[*]   The number of research articles published in acceptable fields with peer review in proportion to full-time faculty.

21) **Indicator 5.1**   Processes and mechanisms to provide academic services to the society mentioned in the objectives of the institution.

22) **Indicator 5.2**   The percentage of full-time faculty who are involved in providing academic services as consultants, thesis committees outside the institution, academic or professional committees at the national or international level in proportion to the number of full-time faculty.

NOTE: * refers to SUT indicators added to OHEC indicators.

23) Indicator 5.3   The percentage of academic and professional service activities/ projects responding to the needs for development and strengthening society, the community, the nation and the international community in proportion to the number of full-time faculty.

24) Indicator 5.4   The percentage of satisfaction levels of those who receive services from the institution.

25) Indicator 6.1   A process and mechanism for the preservation of the arts and culture.

26) Indicator 7.1   The institution council exhibits good governance and drive the institution to compete at an international level.

27) Indicator 7.2   The exhibition of leadership among administrators in all levels.

28) Indicator 7.3   Institution development for transformation into a learning organization.

29) Indicator 7.4   A human resources system and mechanism to develop and maintain qualify and efficient human resources.

30) Indicator 7.5   Effectiveness of the database system for teaching and learning and research activities.

31) Indicator 7.6   The level of achievement in allowing external individual to participate in the institution's development.

32) Indicator 7.7   The percentage of full-time faculty who received academic or professional awards at the national and international level.

33) Indicator 7.8   An implementation of risk management programs in the programs in the education management.

34) Indicator 7.9   The level of achievement to convey organizational indicators and targets to the individual level.

35) Indicator 8.1   A system and mechanism to allocate and analyze expenses and audit finance and budgeting efficiently.

36) Indicator 8.2   Internal and external sharing of resources.

37) Indicator 9.1   A system and mechanism for internal quality assurance infused as one part of the education management process.

38) Indicator 9.2   A system and mechanism to share knowledge and skills relevant to quality assurance to the students.

39) Indicator 9.3   The level of achievement of the internal quality assurance program.

40) Indicator 10.2   The impacts of using 3D policy on students' knowledge, good attitude, and behavior.

41) Indicator 11.1*   A system and mechanism to adapt, transfer and develop technology in accordance with university's objectives.

42) Indicator 11.2*   Percentage of full-time faculty participating in technology adaptation, transfer, and development in proper proportion to the number of full-time faculty.

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NOTE : * refers to SUT indicators added to OHEC indicators.

43) **Indicator 11.3***   Percentage of activities/projects for technology adaptation, transfer, and development in proper proportion to the number of full-time faculty.

44) **Indicator 11.4***   Percentage of administrators' satisfaction in technology adaptation, transfer, and development .

There were 6 indicators that should be improved to meet the standard (2 points). They are:

1) **Indicator 2.1**   A system and mechanism for curriculum development and management.

2) **Indicator 2.14***   Percentage of disqualified students per batch
   a. Undergraduate level
   b. Graduate level

3) **Indicator 2.15***   Percentage of undergraduate students graduating within the time schedule in each batch.

4) **Indicator 2.16***   Students' GPA per year.
   a. Undergraduate level
   b. Graduate level

5) **Indicator 7.10***   Clients' satisfaction with the services under the principle of "centralized services, coordinated missions".

6) **Indicator 10.1**   Institutional Administration and management 3D

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NOTE: * refers to SUT indicators added to OHEC indicators.

There is only indicator needed to be improved to meet the standard (1 point). It is:

1) **Indicator 2.6**   The proportion of the number of full-time faculty holding the position of instructor, assistant professor, associate professor, and professor to the number of full-time faculty.

Another indicator that needed to be improved to meet the standard (1 point) is:

1) **Indicator 2.4**   The proportion of the number of full-time equivalent students to the number of full-time faculty.

NOTE: Indicator 2.4, the proportion of the number of full-time equivalent students to the number of full-time faculty achieved 0 score of assessment result because the proportion of the number of full-time equivalent students to the number of full-time faculty of each academic institute is much higher than the standard value of OHEC. When considering the SUT identity, it has been found that this indicator may not be suitable for SUT, which has the teaching and learning policy of integrating various forms of technology to support classroom activities with better quality in which students can gain access to the technology at all time, e.g. SUT e-learning and other supporting systems through the Center for Library Resources and Educational Media, and the Center for Innovation and the Educational Technology, and the Teaching Assistant System to support students' skills and knowledge. In addition, faculty and instructors are regularly and concretely evaluated by assessed by the students through the Faculty Development Academy leading to an efficient teaching with effective results, as can be seen from high students' satisfaction with faculty's teaching in both undergraduate and graduate levels, high employers', entrepreneurs', and graduate users' satisfaction, high percentage of graduates' employment, self-employment and high level of average starting salary.

3. According to the appraisal results, the indicators that should be improved and those that must be improved to meet the standards, when arranged in accordance with the administration principle of Balanced-Score Card (BSC), can be divided into 3 groups as follows:

3.1   Students' and stakeholders' Group consists of 3 indicators:

1) Indicator 2.14*   Percentage of disqualified students per batch
   a. Undergraduate level
   b. Graduate level

2) Indicator 2.15*   Percentage of undergraduate students graduating within the time schedule in each batch.

3) Indicator 2.16*   Undergraduate students' GPA per year
   a. Undergraduate level
   b. Graduate level

Suranaree University of Technology and its departments involved with the assessment should have measures for encouraging and supporting higher achievements in students; higher GPA, decrease the number of students' disqualification, and increase the number of students' graduation within time schedule, by using the following input and process measures.

Input Measures

- Conduct more public relations campaigns focusing on target groups of high potential students, such as students from Academic Olympic Camp, Promotion and Development of Mathematics and Science Genius Camp, and students from various special programs. The campaign has to be implemented all the year round by assigning a particular unit to take direct responsibility in the form of "School Relation Section" to work closely with the faculty.

Process Measures

- Allocate various forms of scholarships for more students with high capability, for example Tutor Scholarships and Research Grants, to become the "key force" for acting as "friends help friends" in studying and enhancing the university's reputation.

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NOTE: * refers to SUT indicators added to OHEC indicators.

- Follow-up students' study results, assist them with their study to improve their performance, such as establishing the Development for Student Achievement's Committee, and increasing the roles of advising lecturers through:

  The Division of Student Affairs. The division should provide a counseling office for students who have problems concerning their studying or other difficulties.

  The Academic Institutes and Schools. Each institute should have a place for students to organize their activities together.

  The Faculty Development Academy. This faculty should immediately create an efficient and effective advising-lecturer system.

- Arrange a learning evaluation and assessment system that helps lessen students' tensions, for example, increasing the number of examinations for each course enabling students to become more enthusiastic about learning.

- Increase class time or tutor time for fundamental courses to adjust the knowledge base of students with low performance.

- Promote student activities related to academics and learning, for example Academic Club for learning support in the form of "friends help friends", "Senior helps juniors", Student Council for brainstorming students' learning problems and solutions for the university.

- Implement continuity classroom research process, particularly in medium-size and large-size classrooms to find out causes of students' failures, find out solutions, and put the research results into immediate practice.

Suranaree University of Technology should investigate causes of students' GPA being lower than the target each year, of students' being disqualified higher than the target at both undergraduate and graduate levels in each batch year, and of lower rates of undergraduate students' graduation within specified time in each batch through institutional research in order to analyze and compare it with those of other universities with the same characteristics, determine solution measures/methods and include them in an operation plan for more serious solutions to the problems with concrete results. Besides, a specific responsible person and time frame should be assigned.

3.2   Staff, Learning, and Innovation Group has one indicator.

   1) Indicator 2.6   The proportion of the number of full-time faculty holding the position of instructor, assistant professor, associate professor, and professor to the number of full-time faculty.

SUT should do the following:

   3.2.1   Determine individual development plan concerning the advancement of instructor career through support system, such as yearly teaching plan/workload, and plan for developing teaching materials/books. Implement advisory system and motivate instructors who lack academic position or those who want to get academic promotion to be able to produce academic work in the form of textbooks, books, and publications in quality journals.

   3.2.2   Promote, encourage, and support instructors to get published continuously and increasingly in well recognized national and international journals with peer review and acceptable in the field of study, for example by:

   -   Allocating funds/facilities/equipment for faculty with high capabilities to produce quality research with high impact and citation in a refereed journal or in well accepted national and international databases continually.

   -   Providing support system in data analysis and language correction to fulfill the cycle of research publication.

   -   Determining the workload with research mission as part of performance evaluation without affecting teaching and learning activities as a whole.

   -   Develop a quality university journal into high impact factor national journal in order to support academic output of the university faculty.

   3.2.3   Develop academic cooperation with leading institutes with concrete results. In doing this, the university faculty have participated in activities that support the academic strengths with competent researchers. Invite well-known, recognized scholars in their fields to work as visiting professors who will to teach and conduct research with faculty and students in order to develop knowledge, research and human resource database for SUT.

3.2.4 Emphasize the significance of spreading SUT research output published in English, of disseminating university news and information as well as the university's website in English in order to become a world class university. Therefore, the university should have a proficient work unit to support such implementation.

3.3. Internal Process Group has 3 indicators.

    1) Indicator 2.1   A system and mechanism for curriculum development and management.

    2) Indicator 7.10*   Clients' satisfaction with the service under the principle of "Centralized Services Coordinated Missions"

    3) Indicator 10.1   Institutional administration and management 3D (3D)

The university and the departments involved should do the following:

3.3.1 Thirty three curricula are beyond the assessment cycle and are now being improved. The following departments should assess their curricula immediately (percentage of the curricula in the process of adjustment is 100 percent).

    1) Institute of Science

        (1) School of Mathematics (Master's and Doctoral degree)

        (2) School of Remote Sensing (Master's and Doctoral degree)

        (3) School of Laser Technology and Photonics (Master's and Doctoral degree)

    2) Institute of Agricultural Technology

        (1) School of Biotechnology (Master's and Doctoral degree)

    3) Institute of Engineering

(1) School of Transportation Engineering (Master's degree)

(2) School of Computer Engineering (Master's degree)

(3) School of Telecommunications Engineering (Master's and Doctoral degree)

(4) School of Polymer Engineering (Bachelor's, Master's, and Doctoral degree)

(5) School of Production Engineering (Bachelor's degree)

4) Institute of Medicine

(1) School of Environmental Health

(2) School of Occupation Health and Safety

3.3.2 The university and its departments should adjust the implementation in order to continuously increase the level of clients' satisfaction under the policy of "Centralized Services Coordinated Missions". In doing this, the university should bring the assessment results of clients' satisfaction in terms of "Centralized Services Coordinated Missions", internal process, finance, and innovation learning in order for each work unit to plan, develop, and improve the implementation continually:

3.3.3 The university should provide training/conference on concept and regulations related to the administration and management system of "Centralized Services Coordinated Missions" to the target personnel group, particularly new personnel to understand the system.

3.3.4 The university should develop an institutional development plan in accordance with the educational institution policy 3 D (3D) with concrete results, and a resource management plan to encourage an operation as planned. The university should develop system, mechanism, and follow-up the operation and develop innovative educational administration and management 3D (3D).

Achievement Results of Educational Quality Assurance (Academic year 2006-2010)

Component 1: Philosophy, Commitments, Objectives, and Implementation Plan

1. The university has an annual operation plan and various projects that accord with its commitments and vision as well as national strategy, and can respond to both internal and external changes. Besides, the assessment results of the university's strategic plan period 9 were used for developing the university's strategic plan period 10 (2007-2011) and the annual operation assurance.

2. The university has adjusted measures or methods for following-up, editing, and appraising its achievements in the unit levels and personal level, based on the annual operation plan. These measurements should be clearly and concretely implemented. The committee of the University Council has been involved in the following, editing, and assuring the university performance, two times a year. In addition, the follow-up and assessment according to the educational quality assurance system is done annually while the internal assurance has been carried out four times a year and its results are used for SWOT analysis. The university also has the Risk Management System which is assessed by Office of the Auditor General once a year.

Component 2: Teaching and Learning

1. The university has followed-up the students' performance and takes the results of faculty teaching evaluation by the students to adjust their teaching constantly and with concrete results.

2. The university carried out institutional research to investigates issues in developing teaching and learning, finding out causes and solutions of teaching and learning's problems (http://www.sut.ac.th/dpn/reschedthai.html). For example, large-classroom learning model, factors affecting SUT students in learning achievement for certain course and causes of the first year students' retirement

3. The university developed a modern curriculum which meets certain standards under strict control. The university curricula are continuously well accepted among academic institutions and professions. The university emphasizes having all sections

involved in implementing curriculum development and on concrete partnership in public and private sections.

4. The university has actively publicized its curriculum more and more. For example, Educational Market Exhibition, SUT Curriculum Public relations for Target School, utilization of information technology to reach the target group.

5. The university has researched the need for new curriculum. A public hearing and the assessment of its current curriculum have been conducted to adjust and develop curriculum suitable for education and the national development's direction. SUT Cooperative Education has increased the employment rate and salary of the university's graduates.

6. The number of university faculty holding Doctoral degrees has been increased. The university concretely keeps its standard in recruiting high potential instructors, teaching test, teaching evaluation (http://fda.sut.ac.th), and performance appraisal (http://mis.sut.ac.th/MISPublic?Default.aspx). The university has supported good and intellectual personnel in the form of awards, for example, an excellent teaching award, outstanding research award, and innovation of excellence.

7. The university provides support for instructors holding Master's degrees to pursue their studies in the doctoral level, with internal and external scholarships, and study leave.

8. The university has promoted Teaching Support Unit to Faculty Development Academy (http://fda.sut.ac.th) for constant and regular development of faculty's teaching and learning quality. For example, providing teacher training in teaching methods, student-centered learning, large-classroom learning, life-long learning, and deep and active learning to increase student's satisfaction with faculty's teaching.

9. The university supports faculty for higher academic rank by encouraging and providing support for conducting quality research, One Instructor One Product Project, adjusting payment for faculty's academic rank, publication of research articles in international journals, and publication of textbooks and teaching materials.

10. The university has a faculty and a research mentoring system.

11. The university employs measures for maintaining students which decreases the percentage of disqualified students in each batch, and an advisory system to follow-up students' performance, advise, suggest, and interact with them constantly.

12. The university provides and organizes new student orientation to improve the academic skills which are needed for successful university study, and a fundamental adjustment camp in sciences for freshmen to adjust themselves to a university system that requires self-sufficiency (http://web.sut.ac.th/das). In addition, the university offers tutoring classes teaching by graduates and teaching assistance for undergraduate students who have problems understanding the lessons.

13. The university has measures for attracting more students with excellent academic records from both inside and outside the university. Besides, the university has allocated the following scholarships to the students.
   - Scholarship for outstanding undergraduate student
   - Scholarship for students participating in Academic Olympiads Camp and Promotion and Development of Mathematics and Science Genius Camp, and students from various special projects.
   - Scholarship for potential students to study in the graduate program
   - Supporting funding for thesis (30,000 baht for a Master's degree and 50,000 baht for Doctoral degree) and funding for dissemination of research works (3,000 baht/person/year).
   - Scholarship for university faculty granted outside research funding.

Component 3: Student Development Activities

1. The university has organized activities to support students' development, leading to more students' participation. The university has assigned no class on Friday afternoon and promoted budgeting for conducting various activities. This resulted in a high level of students' satisfaction and concrete benefits for the community.

2. The university has placed an importance on students who have good academic records and participate in university's activities, and outstanding students in sports to be a role model for other SUT students. In doing this, the university has granted scholarships, awards for outstanding activity students, and excellent sports players.

3. The university has realized the importance of SUT alumni, thus academic institutes have constantly organized SUT Alumni Relations including granting yearly awards for role model alumni to be a good example and direction for both current students and other alumni.

Component 4: Research

1. Although being the youngest university, SUT was evaluated and recognized as one of the nine National Research Universities, thus indicating a great development in a short period of time.

2. The university has a clear direction for more research works that can answer the local and national needs. As a result, research activities have been conscientiously conducted through research units and centers in which researchers work collaboratively and effectively as a team.

3. The university motivates its faculty to produce more quality research work in the national and international levels, through various measures such as matching funds, and the development of research infrastructure. In addition, there has also been support for research activities from various internal funding sources, such as the SUT Research and Development Fund and Her Royal Highness Princess Maha Cahkri Sirindhorn Innovation and Invention fund, which emphasize high quality research work leading to innovation and invention. The university has initiated measures in determining instructors/researchers' work load by comparing their teaching load and load for research activity. The instructor who conducts many research will teach less.

4. The university has a research mentoring system and grants 100,000 baht to new faculty development for his/her research activity. The university also provides research training to enhance research skills of the faculty toward national development.

5. The university has produced various applied research outputs: SUT Mobile Online Test System, Multimedia Motion Software for Problem-based Learning in C Language Computer Programming Course, Bedtime Milk, Batter-powered Lawn Mower, Crop Chopping Machine, Heat Inductor for Household Industry, Ethanol Fuel Generator Using Combined Techniques of Vapor Separation Through Fibre and Absorption, Thai Herbs for Reducing Decreased Sex Drive Symptoms in Men, Small Machine for Aerated Autoclaved Concrete Production Using CLC system, Landmark Audio-Guiding Systems, Position-Reporting GPS System Via GPRs Network, Low Temperature Stoneware Product, Production Processes of Orange and Lemon power with Spray Drier and Freezer, Bats Repelling System using High Frequency Wave.

6. The university has established an Intellectual Property Management Office (IPMO-http://www.sp.sut.ac.th/ipmo/) leading to a commercial operation of intellectual property, such as Serisin Protein from Silk Cocoon Production Process and Rice Pasta Production Process, and publishing intellectual property regulations.

7. The university allocates funds for supporting faculty's research presentation both in Thailand and abroad. As a result, researchers and the university are recognized and play a key role on an international platform as evidenced by the fact that more university faculty/researchers have been asked to be invited speakers and keynote speakers. Other evidence is that they have played a significant role in organizing an international conference abroad, as well as being the host for international conference in Thailand or at the university.

8. The university gives emolument to the faculty for their research published in an international journal that has impact factor and appears in an international database (SCOPUS or ISI). That is, the university will give extra emolument to the corresponding author of published research who is SUT faculty.

Component 5: Academic Services to the Community

1. The university provides various types of community services through Technopolis, Public Academic Service Unit, Institute of Agricultural Technology (http://csu.sut.ac.th/), and many academic institutes, centers/ institutes and divisions of SUT, including coordinating services of the university with public and private sectors.

2. The university has constantly developed a service system, such as "one stop service" which increases a continual satisfaction of various service recipients.

3. The university has continuously organized activities to promote relationship between SUT and nearby communities and the Nakhon Ratchasima province. The university, therefore, develops policy encouraging administrators, faculty, and support personnel to collaborate on community services. For example, the university hosted the University Games of Thailand, co-hosted The 24th SEA Games, and Loy Kratong Festival of Higher Education Network in Nakhon Ratchasima, as well as cooperates with Day of Ya-Mo's Victory, SUT Thirty-two Districts Thirty-Two Doctors Project, and Schools in front of Our Home Project.

Component 6: Preservation of Arts and Culture

- Even though SUT is a technology-oriented university, it places importance on art and cultural preservation and promotion, such as Wai Khru (paying respect to teachers) Ceremony, Loy Krathong Festival, Phalang Day, the Baisri Soo Khwan (a regional welcoming ceremony for new students), the Rod Nam Dam Hou, Songkran Day (Thai New Year), the Tod Krathin and Tod Pha Phaa (making merit), and Regional Thai Kite Competition. In addition, the university has allocated budget for conducting research on regional technology, Thai house hi-tech, and has built Thai Studies and Anthropological Collection Room.

Component 7: Administration and Management

1. The university has developed a training program for new faculty administrators to have better understanding of the mechanism and direction of university administration, through experienced executive administrators from internal and external organizations. The training also develops teamwork skills among new faculty administrators in order to strengthen their relationship and lessen problems in collaboration.
2. The university has developed the Management Information System (MIS) for continuous use with an emphasis on sustainable self-development. The SUT-MIS database unit takes direct responsibility for MIS and publicizes its use to university personnel for effective administration and management.

Component 8: Finance and Budgeting

1. The university has followed the regulations of finance based on the principle called "Centralized Services Coordinated Missions", that allows utilizing shared resources both internal and external sections, as efficient and profitable as possible.
2. The university's financial information has been continuously used for the analysis of expense, financial status, and stability of the university. The information is as follows:
   a. Fix assets per number of full time equivalent students
   b. Total expenditure per number of full time equivalent students
   c. Percentage of total balance per operating expenditure

Component 9: System and Mechanism for Quality Assurance

1. SUT has an internal quality assurance system for editing and appraising achievement at the institutional level and unit level, by a distinguished expert, both internal and external.

2. The university uses results of the internal and external appraisals to adjust its performance. The internal appraisal result is one part of the university's educational administration process. In addition, there is a quality assurance committee to follow-up the university's performance based on its quality assessment results.

3. The university has disseminated its quality assurance system through the university's website (http://www.sut.ac.th/qa/)

4. The Division of Student Affairs and the Division of Academic Affairs have organized a workshop on Educational Quality Assurance for the students.

5. The university has promoted educational quality assurance network between internal and external organizations.

Component 10: Government Policy of " Institution 3D (3D)"

SUT has implemented the "Institution Policy 3D" as evidenced by the following:

1. **Democracy**   e.g. an election for Student Council Administration Organization, committee member of student club, committee member of student dormitory, including activities for honoring the Royal Highness.

2. **Decency**   e.g. making merit, listening to sermons, practicing dharma, wearing traditional Thai costume to Thai festivals such as Songkran Day and Loy Krathong Day.

3. **Drug-Free**   the university has educated students about the negative effects of taking drugs, and run a campaign on anti-drug. The university provides supports in the form of budgeting, resource, facilities, and personnel.

Component 11: Technology Adaptation Transfer and Development

- SUT has carried out technology adaptation, transfer, and development through Technopolis, a major university unit coordinating in providing supports for faculty to exploit their knowledge and experience in offering academic services. There are various activities/projects of technology adaptation, transfer and development: Industrial Technology Assistance Project (iTAP), Unit of Business Incubator (UBI), Science Park, Cassava and Cassava Product Research Center Project, Intellectual Property Management Office (SUT-IPMO), Thirty-Two Districts Thirty-two Doctors Project.

Concerning/Suggestions

1. The university should implement the MIS system to be a major source of data in educational quality assurance as soon as possible.
2. The university should have a system to transmit its strategic goals and provide mutual understanding to all personnel levels for effective achievement.
3. Many university organizations do not use the appraisal results to adjust their performance seriously and continuously.
4. The university should analyze the assessment results of Component 2, teaching and learning, in which its score is constantly lower than 3.

Results of Quality Assessment by Components at Institutional Level

Executive Summary

SUT is fully resolved to be a research-oriented university in adherence to its management principle of "Centralized Services Coordinated Missions". According to the overall results of the quality assessment for the academic year 2009, SUT obtained a very good result (with an average score of 2.85). When the three groups for input, process, and output factors are taken into consideration, the for input received a good result whereas those for process and output obtained a very good result.

An analysis of the quality appraisal, based on the 41 OHEC indictors for the years 2007, 2008, and 2009 self-assessment at an academic institution revealed that four of the academic institutes which achieved a continuously high score were the Institutes of Science, Social Technology, Agricultural Technology, and Medicine. The assessment score for the Institute of Engineering fluctuated due to an alteration in its graduate employment status shown in the indicator 2.9, and probably also because of a variety of assessment criteria in indicator 7.9. In addition, the Institute of Nursing underwent the first quality assessment for the academic year 2009.

When considering levels of collaboration, 10 out of 24 work units have shown a constant increase in their assessment scores: The Center for Scientific and Technological Equipment, The Center for Educational Services, The Center for Computer Services, The Center for Innovation and Educational Technology, The Institute of Research and Development, The Division of Academic Support, The Division of Personnel, The Division of Buildings, The Internal Auditing Unit and The SUT Bangkok Office Unit. Twelve work units had assessment scores which were inconsistent including The Center for Library Resources and Educational Media, The Center for International Affairs, The Center for Cooperative Education and Career Development, Technopolis, The Division of Correspondence and Legal Affairs, The Division of Finance and Accounting, The Division of Procurement and Supplies, The Division of Planning, The Division of Student Affairs, The Division of Public Relations, The Sports and Health Center, and The Office of the University Council. However, their average scores were higher for the academic year 2009. The only work unit whose scores decreased was The Faculty Development Academy. The first results for the SUT-MIS Database Unit were for the academic year 2009.

From an analysis of SUT's performance, it was found that, generally speaking, SUT succeeded in its missions with a 50% increase as shown by the results of 99 indicators out of 105.

SUT has implemented 5 strategies for development and 30 strategic plans (measures) to fulfil its purpose as '...a learning organization with academic excellence in science and technology, which creates knowledge, moral ethos, and wisdom for the development of a happy and sustainable society". However, an analysis of the annual indicators for both strategy and performance has shown that the university's goals and its plans to achieve them lack clarity.

General Proposals

1. The university's vision should be revised to make it more explicit and to ensure that it corresponds to the requirements of a national research university.

2. To achieve the university's vision, its strategic plan should be revised by setting up a high quality and challenging Strategic Plan KPI that matches its potential, its goals, and which takes into account all of its academic institutes and internal divisions.

   Furthermore, the university should have a strategic planning process which would include both Strategic Development and Strategic Deployment. The university, therefore, should provide a strategic plan for finance, for deployment of its resources, materials and equipment, and a plan for management of the workforce.

3. Although SUT's personnel management system in the context of a public autonomous university has a high level of flexibility and can accommodate changes, there is still a shortage of experienced academic personnel in specific fields. Accordingly, the university should improve the efficiency of its personnel management system at all levels (university executive, faculty, and staff), and include dissemination strategy for the recruitment of personnel who have excellent potential and are suitable for the university's mission. Furthermore, the university should implement a system of career promotion as soon as possible.

Strengths/ Suggestions/Weaknesses/ Solutions for individual items

Component 1 : Philosophy, Commitments, Objective and Implementation Plan

Strength	Suggestion
1. Suranaree University of Technology has shown its determination to be a research university and was selected as one of the top nine national research universities.	1. Increase a dissemination strategy to strengthen collaboration among academic institutes, units, and personnel in all levels, in order to be a national research university.
Weakness	**Solution**
1. Criteria for achieving the annual performance plan's indicators at 50% is not sufficiently challenging.	1. Set higher criteria for goal-oriented achievement in order to create more challenging work and publicize it throughout the university.

Component 2 : Teaching and learning

Strength	Suggestion
1. Ratio of doctoral instructors is 77.62% higher than OHEC's criteria at 60%	1. Increase the ratio of doctoral instructors to meet the standard requirements of a world class university, and provide incentives to encourage more research work.
Weakness	**Solution**
1. In the academic year 2009, a total of 53 out of 86 curricula, which is 61.63%, have been revised according to the 2005 standard criteria for higher education curriculum. However, a total of 33 curricula, or 38.37%, have still not been revised.	1. The university should have a plan and an operation for academic institutes to revise and develop their curricula according to the 2005 standard criteria for higher education curricula and the standard framework TQF within the academic year 2012.

Weakness	Solution
2. Ratio of instructors at some academic levels is low, particularly at the level of associate professor (13.85%) and professor (2.90%).	2. Create a mechanism for assisting instructors to get academic promotion in a specific term regulation.
3. Percentage of undergraduate students who fail to graduate in a specific time has been high for many years.	3. Conduct in-depth analysis in order to find a reason for students' failure to graduate within a specified time. Previous measures should also be analyzed to find the causes of failure, in order to make further adjustments and suggestions.
4. Problems of students' educational quality concerning grade point averages, retirement, and failure to graduate within a specified time has continued for many years.	4. As a national leading university, the university should be a driving force in the Thailand educational system, especially at lower levels of education, on issues relating to teaching and learning management, autonomous learning, admissions, and quality of teachers which is a major factor for the quality of education.

Component 3 : Activities for Student Development

Strength	Suggestion
1. Cooperative Education has been integrated as part of the undergraduate curricula in order to cultivate students' direct work experience and prepare them for their professions. The university has received the National Outstanding Cooperative Education Award for the year 2010.	1. Research and develop knowledge of Cooperative Education as a mean for its efficient implementation or innovation.

Strength	Suggestion
2. There is an evidently concrete development of the tutoring and peer learning systems that help cultivate students according to their potentials.	2. Continuously develop the tutoring and peer learning systems throughout the academic institutes.

Weakness	Solution
1. Methods for encouraging activities that are compatible with the university's vision and the satisfactory performance of the students are unclear	1. Provide a clear and comprehensible management system for the development of student activities, which will integrate the university's vision and the satisfactory performance of the students, within the standard framework for the establishment of quality in higher education, as well as for activities for Institutional Development 3D.
2. No analysis of an overall effectiveness of the project in accordance with the vision, the quality of the students, and the 3D institutional development.	2. The assessment results of the students' projects/activities should be analyzed in order to be a resource for managing a complete plan/ project associated with the university's vision, and the quality of the students, and the 3D institutional development.

Component 4 : Research

Strength	Suggestion
1. The university was selected to be a national research university. A total of 233 articles were published in national and international journals and received the full score of 3 points for research indicators. In addition, previous scores from the past 3 years (2007-2010) have continuously increased. The university also has conducted outstanding research on arts and cultural promotion and presentation.	1. Provide measures or methods for supporting the 385 research disseminations in getting published in the academic journals and for the university to be a national research university.For example: - Fully prepare research data for the management of research by making the Library Resources Educational Media play a significant role in providing research support. - Develop a system or mechanism, such as TAs and RAs, to allow instructors to have time to conduct their research. - Develop the budget on the basis of results/performance - Support the integration of the research units or groups in order to develop the university as an outstanding research center, which would be recognized nationally and internationally, and to prepare the university for an international ranking system. 2. The compiling, selecting, analyzing, and synthesizing processes are not clear. Therefore, the implementation of these processes should be conducted throughout the academic institutes in order to develop the relevant research information.

Weakness	Solution
1. Only certain faculties have been granted research funding.	1. Add incentives in the form of cash and non-cash incentives such as emoluments, rewards or honor to increase faculty's awareness of the university as a national research university, encouraging them to conduct and publish their research to establish their academic rank.

Component 5 : Academic Services to Community

Strength	Suggestion
1. There is a university unit, Technopolis, that provides full academic services that are well recognized nationally. It is obviously responsible for transferring and adapting technology to academic services through an integration of technology with teaching-learning and research. It also has various outstanding projects such as the Cassava & Cassava Product Research Center Project, and the Bio-Organic Fertilizer Project.	1. Provide mechanisms for the establishment of activities that fulfill the further needs of the public and private sectors. Additionally, institutional research covering all related sections should be conducted. Increase integration in teaching-learning and research to strengthen them and to provide moral support and motivation for all personnel and faculty.

Component 6 : Preservation of Arts and Culture

Strength	Suggestion
-	-
Weakness	**Solution**
-	-

Component 7 : Administration and Management

Strength	Suggestion
1. The university has established its vision as a learning organization and has 23 work units to carry out its objectives	1. Develop and strengthen a knowledge manage ment system. For example: - Add data follow-ups and assessment systems that provide useful data (probably in the form of Moodle) to the management information system. Also, provide a system that allows people to participate in knowledge development, such as using Wikipedia. - Provide a system of incentives to good practice units. - Encourage the transmission of experience and knowledge, as well as publicizing the university's systems and its results.
Weakness	**Solution**
1. The administration of human resources and mechanisms for developing and maintaining the efficiency and quality of personnel are not covered at all levels	1. Most of the university's systems focus more on the development of academic personnel than on the supporting personnel or administrative staff. Therefore, the university should pay more to the development of the administrative staff in order to provide career paths by providing motivation, incentives, and support for continuous learning.
2. The database system is from various sources of data and a new single source data system is still being developed.	2. Develop a database in the form of single source data.

Component 8 : Finance and Budgeting

Strength	Suggestion
-	-
Weakness	**Solution**
1. The university has no strategic plan for finance, making its plan for financial resources obscure and incapable of matching its vision and missions.	1. Create a strategic plan for finance that can be linked and associated with other strategic plans. Include a budget allocation process that reflects the necessity of using resources inclusively and compatibly for all missions.

Component 9 : System and Mechanism for Quality Assurance

Strength	Suggestion
1. Executive administrators value educational quality assurance and have implemented it with cooperation from all personnel levels, students, and stakeholders. The results of the appraisals provide data for the university to achieve continuous improvement. For example, QA Forum has been organized in the public autonomous university's conference.	1. Develop research information in quality assurance to generate innovations or to suggest excellent practical regulations and make these available for the use of other institutes of higher education.
Weakness	**Solution**
1. Some additional indicators and standard criteria of the university do not indicate its quality.	1. Indicators and standard criteria added by the university should be analyzed and adjusted to reflect the quality of the university, the academic institutes, and the work units.
2. The university's management information system does not fully support the quality assurance system. At present, there is no connection and it is not usable.	2. Develop the management information system of the university to fully support the quality assurance system.

Component 10 : Government Policy of "Educational Institute 3D (3D)"

Strengths	Suggestions
-	-
Weaknesses	Solutions
1. No educational development plan according to the Institutional 3D policy has been carried out since this policy was launched in November 2009.	1. Implement the institution development plan according to institutional policy and plan resource management in order to support its implementation.
2. Neither monitoring, following up on educational development or providing supporting innovation for institutions, according to the educational standard 3D have been issued.	2. Develop a system and mechanisms to monitor and follow-up the implementation and the innovation of institutional administration 3D.

Component 11 : Technology Adaptation, Transfer and Development

- Read Component 5

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