Chapter 2
Review of Literature

This research, the researcher has studied the documents , theories, and other studies related to this research. Researcher presented literature the following topics:

1. Measurement and evaluation in basic education core curriculum B.E. 2551
2. Student standards for educational quality assurance
3. Monitoring, supervision, and evaluation in basic school
4. Concept theory information technology development
5. Preparation of data and information systems in schools
6. Database management system
7. Software development methodologies
8. Research and development in education
9. Related research
10. The research conceptual framework

Details are as follows:

1. Measurement and evaluation in basic education core curriculum B.E. 2551

The Ministry of Education has ordered the Basic Education Core Curriculum B.E. 2551 in schools across the country. From academic year B.E.2553 onwards (The Ministry of Education, B.E. 2553). The concept of courses is standards-based curriculum. That is standards of Learning curriculum set a target for the development of the learners. Learning standards specify what students should know and practice it on a basic education. Measurement and evaluation of learning in basic education core curriculum B.E. 2551 focuses on collection process, checking, interpretation of learning results. And the data of standards and indicators used in the development of the learner as well as judging learning outcomes. Assessment for Learning (Formative assessment) an evaluation should take place in the classroom every day to find a highlight and weaknesses that need improvement. The result of the judgment (Summative assessment) is used at the end of a unit of study or course completion.

Components of the measurement and evaluation of learning in the basic education core curriculum B.E. 2551 has 4 sides like the basic education curriculum B.E. 2544. These are 1) to evaluate the learning group 2) to assess of reading, thinking and writing 3) to evaluate the desirable characters 4) to evaluate the activity development of the learner. But it has more details the originally to assess learning outcomes at all, but in the curriculum B.E. 2551 to evaluate the indicators every year and pass a measure determined in accordance with the study not less than 60 percent.

Desired characteristics of the learner defined in 8 items are 1) Love of nation, religion and king 2) Honesty and integrity 3) Self-discipline 4) Avidity for learning 5) Observance of principles of Sufficiency Economy Philosophy in one's way of life 6) Dedication and commitment to work 7) Cherishing Thai-ness 8) Public-mindedness. Features such as the regulation of all basic schools in Thailand and possibly more depending on the needs of individual schools.

Learner development activities on this curriculum still have consulting activities and student activities and this curriculum addition social and public activities. Allocation of time to the following: primary (P.1-6) for 6 years amount 60 hours, lower secondary (M.1-3) for 3 years amount 45 hours, and upper secondary (M.4-6) for 3 years amount 60 hours.

Measurement and evaluation of learning. There is no practical difference. The core curriculum provides more details. The Basic Education Core Curriculum covers three educational levels as follows.

1. Primary Education Level (Primary education grades 1-6)

1.1 Judging, grading and reporting on learning outcomes, Educational institutions established guideline for assessment of learning to determine the learning outcomes of the students as follows.

1) Learners must have an attendance record not less than 80% of the total learning time requirement; 2) Learners must be assessed on all indicators and must pass the criteria prescribed by the educational institutions; 3) Learners must be judged on the learning outcomes of each course; and 4) Learners must be evaluated and must pass all the criteria prescribed by the educational institutions regarding reading, analytical thinking and writing, desirable characteristics and learner development activities.

1.2 In judging for the purpose of grading learning outcomes of each course, educational institutions can grade the level of learners' learning outcomes or the quality level of their performance by using numerical, alphabetical, and percentage systems or a system that uses key words to indicate the standard attained.

1.3 Class upgrading, using the same approach as the judging results.

1.4 Repeatedly learning in class, in curriculum B.E. 2551 determines if the student does not pass the course, and the most likely to disrupt learning in higher grade levels, education committee may be set to repeat learning in class. Anywise, taking into account the maturity and ability of the students is important.

However, in cases where the student ineligible for one, schools may use their discretion to upgrade the next class, considering that 1) Student attendance less than 80 percent due to the necessity or force majeure but every other qualifying items are complete. 2) Learning standards and indicators unrestricted educational determined in each subject, and that can be taught in the next academic year remedial and other qualifying items are complete. 3) Grade 1-3 learners effective assessment in Thai and mathematics learning are fair, and Grade 4-6 learners effective assessment group learning Thai, math, science and social studies are passing.

1.5 Remedial Teaching, remedial instruction shall be deemed to be part of the learning process. Apart from teaching the lesson plans. The purpose of the students to achieve the required standard.

1.6 Completing primary school (Grade 1-6)

1) Learners studying basic courses and courses / additional activities. By the time the core curriculum for basic education required. 2) Students need a basic course evaluation results through the evaluation criteria set by the institution. 3) Students are assessed in reading, thinking and writing through the evaluation criteria set by the institution. 4) Student assessment results of the desired characteristics. Level through the evaluation criteria set by the institution. 5) Students participate in learning and development assessment through the evaluation criteria set by the institution.

2. Secondary Education Level (Secondary education grades 7-12)

2.1 In judging for the purpose of grading learning outcomes of each course, eight numbers are applied to indicate the level of the learning outcomes in each semester. Upgrading class, going through the school academic year. The curriculum is set to finish lower secondary school and upper secondary school. Criteria for assessment and evaluation of learning to determine the learning outcomes of the course the students are as follows. 1) Decisions about the course Class time throughout the semester, students must have no less than 80 percent of the time in those courses. 2) Learners must be assessed in all indicators and meet the criteria for the study required. 4) Learners must be assessed and evaluated according to the criteria defined in the study reading, thinking and writing, desired characteristics, and development activities.

2.2 The learning level Judge in order to obtain the course of learning. The figures show the learning level in 8 level courses that will count as credits. This must be from level 1 to whatever learning level.

2.3 Completing lower secondary school (Grade 7-9)

1) Learners studying basic courses and not more than 81 credits of the 63 credits of basic courses and additional courses as scheduled. 2) Students must receive credit throughout the course of at least 77 units of basic courses are 63 credits and additional courses at least 14 credits. 3) Learners with reading, thinking and writing assessment through the evaluation criteria set by the institution. 5) Students participate in learning and development assessment through the evaluation criteria set by the institution.

2.4 Completing upper secondary school (Grade 10-12)

1) Learners studies basic courses and additional courses more than 81 credits, 39 units of basic courses and additional courses set by the institution. 2) Students must receive credit Throughout the course of not less than 77 credits, 39 credits of basic courses and additional courses not less than 38 credits. 3) Learners with reading thinking and writing assessment through the evaluation criteria set by the institution. 5) Students participate in student development activities through the evaluation criteria set by the institution.

In addition to the criteria defined broadly. Measurement and evaluation in secondary schools also detailed the offer is subject to the introductory note. 1) Learning with conditions including "No qualified", "Wait", "Pass", and "Fail". 2) Changing the grades "0" 3) Changing the grades “Wait” 4) Changing the grades “No qualified” 5) Changing the grades “Fail” 6) Upgrading class 7) Learning recurrence 8) Remedial teaching.

2.5 Transfer learning, Schools can transfer the learning outcomes of students learning from educational institutions in various cases such as moving schools, changing education model, moving courses, abandonment study, and requests to return to further education. Study abroad and requests to return to further education in the country. Also, continue to transfer knowledge, skills, experiences from other learning resources such establishments, religious institutions, academy of career training, home schools. In terms of the transfer are quite detailed additional documentation should be studied.

2.6 The study documents of the core curriculum for basic education B.E. 2551

2.6.1 The study documents of the Ministry of Education include: 1) The grading records (PP. 1) 2) Certificate (PP. 2) 3) Report of graduates (PP. 3).

2.6.2 Evidence of educational institutions will include 1) assessment results desired characteristics (PP. 4), 2) The development of the course (PP. 5) 3) The development of learners individually (PP.6), 4) Certificates (PP. 7) 5) Student Record Collection (PP. 8) 6) Learning outcomes of learners individually (PP. 9).

Summary measure and evaluate in the core curriculum B.E. 2551 according to the responsibilities into three groups. The teacher serves to measure and evaluate the program. Academic affair define subjects to teacher monitoring and reporting student achievement. And registration serves the educational documents and evidence. By implementing the evaluation must be based on the core curriculum B.E 2551 set.

2. Student standards for educational quality assurance

Constitution of the Kingdom of Thailand, B.E. 2540, Section 81 required that the State shall encourage the private provision of education, training, and management training to occur. "Knowledge and Virtue" And the Law on National Education which led to the national education B.E. 2542. Cause major education reform focused on quality education is given to a system of quality assurance to improve the quality and standards of education at all levels. (Ministry of Education, " Quality assurance of education is basic education", Journal 13, No. 1, January-March, pp. 30-35).

Quality Assurance in education refers to the activity or practice as required by the mission plan, the quality control to determine the quality, and quality assessment that made confidence in the quality and standards of the systems, processes, productivity and results of education. The quality assurance includes inner quality assurance and external quality assurance.

System for quality assurance in education, as part of educational administration which is a process of continuous education improvement. The schools emphasized the involvement of communities and agencies concerned with the promotion, support and supervision of the educational agency consist of

1) The Management and Information Systems with a management structure to support operations. Everyone involved with the publicity for all parties involved. Appointed a committee to set guidelines for comments and suggestions, and the appointment of persons to check, review and educational quality report. And to provide sufficient information on the quality of education to be the vision, mission and development plans.

2) The development of educational standards by focusing learning outcomes of students compliant with the class curriculum.

3) Plan to improve the quality of education. The Plan is the foundation of the school. Consisting goals, strategic, and clear guidelines covering all development activities is a core component of education management and a mutually acceptable to all parties involved put into practice. To achieve the goal of each activity is defined in line with the vision and basic education curriculum standards.

4) The implementation of the development plan, monitoring the quality of education by continuing operations to achieve the development of quality education as defined by annual action plan that clearly covers the work / study program.

5) Monitoring and reviewing the quality of education, will include monitoring and reviewing internal staff education, implementation and monitoring and review of the educational agency.

6) The Quality Assessment focused on the evaluation of the students in the class that is a sentence including grade 3 and grade 6, grade 9 and grade 12 in core subjects by using standardized tests of education agencies compliant with area educational office.

7) Annual education quality reporting. A data quality assessment, monitoring and reviewing internal and external assessment. The authors report on the development of the academic year, which will be used as input for the next development plan.

8) To uphold the quality assurance system. As part of quality assurance mechanisms. To provide feedback to the promotion. Develop and evaluate the implementation of quality assurance system.

Internal quality assurance procedures are detailed below.

1. The preparation, important preparation as below;

1.1 Preparation of personnel, The need to raise awareness of the value of quality assurance and teamwork. This will notify site personnel understand the study or professional speakers from outside. By all staff in schools have the opportunity to attend the get together. And to develop knowledge skills relating to quality assurance to all staff , ensuring operational quality assurance with the workshop. Emphasis on content related to the educational development plan and action plan each year. Subsequently focused on the evaluation framework and plans. Creating assessment tools and data collection. In the end, focus on data analysis. Presentation of the assessment and a self-evaluation report.

1.2 Committee responsible for coordinating regulatory support for all parties to work together and linked to a team. The committee should consider the following chart, administrative structure, which party should be responsible for the development and evaluation of the quality of that work.

2. Stage operations internal quality assurance. Consists of four main steps procedure.

2.1 Plan has to be targeted. Guidelines Responsible for Time and resources required. For various schemes that should do to develop quality of educational institutions. Annual operating plan, the curriculum plan is consistent with the goals of education. The evaluation plan and budget plan etc.

2.2 The plan implementation, while the need to constantly learn more and administration should be to promote and encourage all staff work very happy. Arrangement facilities resources to support the implementation, monitoring both the division and the personnel group and supervision.

2.3 Monitoring, evaluation which is an important mechanism to stimulate the development because it will not reverse the past indicate that the goals are. The evaluation must provide a framework to evaluate. Obtain or prepare a collect analysis, Interpret the data, and monitoring Improve the quality of assessment

2.4 The results of evaluation to improve. On each evaluation is completed, the board responsible for the study. Synthesis and interpretation of the results already presented on stakeholders to improve the performance of the management and staff. To plan the next phase. Information prepared, and the self-assessment report writing.

3. Process for the preparation of self-assessment report or the annual report**.**

On educational evaluation is completed within a report. By the start of the performance and evaluation standards analyzed by the study and wrote the report.

The role of teachers in quality assurance should be as follows.

1. The preparation of their own. This study provides an understanding of the principles, methods, procedures for internal assessment. As well as trying to create a positive attitude in internal evaluation.

2. Cooperate with educational institutions to provide basic information on needs assessment committee.

3. Cooperate with the school on has been appointed to the board in any activities of the internal assessment activities such as attend a performance calendar and evaluation within schools. Jointly organized tool, storage characteristics in internal

assessment process, joint commission survey data collection survey, analyzed data together to evaluate the results.

4. Cooperate with schools in common purpose, standards and indicators to assess various aspects of the institution itself. Together to set standards and criteria and indicators in various fields.

5. Main duties and responsibilities or duties as systematic. Process and in accordance with the standards of education, such as in teaching responsibility to develop curriculum and lesson plans that focus on students is significant. Prepare materials appropriate to the purpose of instruction. Preparation of teaching materials effectively meet the objectives , teaching methods, learning activities created for learners to build knowledge, self-knowledge. Select the appropriate assessment and collection of a variety of conclusions. Evaluation of teaching, the behavior of learners assessment results to improve teaching and learning on a continual basis.

Educational standards is a requirement on the desirable features and standards that need to happen. All educational institutions to serve as the comparable for the promotion and supervision, monitoring, evaluation and quality assurance in education.

Standards for basic education in the internal quality assurance. (Office of the Basic Education Commission, B.E. 2554) the quality of the student consists of 8 standards.

Standard 1 : learners with moral values and desirable with, there is 6 indicators

1.1 disciplined learners are responsible and behave according to the principles of their religion faithfully.

1.2 Students are honest.

1.3 Students with gratitude.

1.4 Students merciful, bountiful hospitality, and sacrifice for the common good.

1.5 Students save to use resources, personal belongings and collective well worth.

1.6 Students take pride in the Thais, popular Thai wisdom, and maintain as Thai.

Standard 2 : Students are conscious in conservation and development, there is 2 indicators.

2.1 The value of environmental learning and the impact of environmental changes.

2.2 To attend or participate in activities /projects, conservation and development environment.

Standard 3 : Learners with the skills to work with the ability to work with others. Profession of faith and a positive attitude, there are 5 indicators.

3.1 Learners with the skills to manage and complete the task.

3.2 Learners have attempt and diligence to work carefully.

3.3 Students work happily, development work and take pride in their work.

3.4 Students collaborate with others.

3.5 Learners have a good feel for the profession of faith, and learn their career interests.

Standard 4 : Learners capable of thinking, analysis, synthesis, critical thinking, creative thinking and visionary with 4 indicators.

4.1 Learners can analyze, synthesize, summarize the concept, systematic thinking, and holistic thinking .

4.2 Students are expected target guidelines and decisions.
(Learners with critical thinking skills, and reflective thinking)

4.3 Students evaluate and select the decision, and resolve consciously.

4.4 The learners have initiative, optimistic and imagination thinking.

Standard 5 : Students have knowledge and skills required by curriculum, there are 5 indicators.

5.1 Learners have average achievement criteria.

5.2 Learners pass national average comprehensive test results.

5.3 Learners can communicate ideas through speech, writing, or presenting.

5.4 Learners can use language to communicate both in Thai and foreign languages .

5.5 Learners can use technology to improve learning.

Standard 6 : Students with skills in the pursuit of self-knowledge, love of learning and self-development. There are 3 indicators.

6.1 Learners have the habit of reading , writing and listening to raise questions, to find out knowledge from various sources around.

6.2 Students have their own way of learning, can learn to share with others, fun to learn.

6.3 can use the library, knowledge and media sources, both in and outside the academy.

Standard 7 : Learners with a good physical and mental health habits, there are 5 indicators.

7.1 Students with hygiene in health care and regular exercise.

7.2 Learners have weight, height and physical fitness criteria.

7.3 Learn to protect themselves from the narcotics and avoid vulnerable to violence accidents, diseases and sexual problems.

7.4 The learners' confidence assertive and honor others.

7.5 Students cheerfulness, good human relations to others, and passion for studying.

Standard 8 : Learners with the aesthetics and character of arts , music and sports , there are 4 indicators.

8.1 Students appreciated the activities and works of art.

8.2 Students appreciated the activities and performance of music / dance, not opposed to their religious principles.

8.3 Students appreciated the participation and performance in sports / recreation.

8.4 Learners and participants, cultures and traditions of the local beauty of Thailand.

External quality assurance refers to the evaluation and monitoring standards of educational institutions by the office of standards and externally. Quality of education, or any person or agency outside the office for quality assurance and certification for development and educational standards of schools.

The role and function of external assessors.

In external quality assessment, the external evaluation will be conducted in a professional manner by adhering role. " Peers " and a " friend" to the school and the community they both learn from each other. Key functions of the external evaluators are as follows.

1) Visits schools Understanding and attitudes were assessed to be about quality. To the personnel of the institutions and stakeholders.

2) Gather information and evidence to confirm the reality of developing quality educational institutions as reported in the self-assessment report . And evidence that reflects the reality that is not in the self-assessment report .

3) Check the processes and methods used to study the acquisition of information, including evidence that the self-evaluation report is appropriate, comprehensive and reliable.

4) Check the results comparable to developing goals / plan of educational development and educational standards that threshold. Due to external evaluation. including target validation / development plan to continue to study for compliance with the assessment.

5) Based analysis and assess the quality of education by external evaluators and provide feedback to students to contribute to the development of high quality education even more.

6) Report on the study on quality evaluation threshold .

The role of teachers in the monitoring and evaluation system.

External quality assurance is continuous internal quality assurance. Schools must prepare an annual self-assessment report to be offered offices Standards and Quality Assessment for external quality assessment (Office for National Education Standards and Quality Assessment, 2555) the schools must be evaluated at least 5 years

at a time. The teacher's roles in the monitoring and evaluation of the quality of the third party role are.

1. Participants self- reporting (SSR) of the institutions.

2. Being visited by an assessor from outside.

3. Receiving feedback from the Office for National Education Standards and Quality Assessment carried out for the improvement.

Standard of basic education in the third round of external quality assurance. (B.E. 2554-2558) The learner's indicators consist of 5 basic standards.

Standard 1 : Learners with moral and ethical values are required 3 indicators.

1.1 Average achievement level of the students after three years is a good active duty students.

1.2 Average three-year retrospective of the students who are the children of the parents.

1.3 Average achievement level of the students after three years as a good member of the community and society.

Standard 2 : Students with physical and mental health indicator is composed of 2 indicators.

2.1 Average achievement level of the students after three years at a healthy weight, and height.

and physical fitness as well as self-care, according to safe.

2.2 Three-year moving average achievement of students with mental health, good human relations to others and creativity

Standard 3 : Students are eager for knowledge and learning is composed of 3 indicators.

3.1 Average achievement level of the students after three years love of reading interest pursuits from various sources around them and can learn at their own pace.

3.2 Achievement by a three-year retrospective of the students to learn as a team.

3.3 Achievement on average three-year retrospective study can use of technology in learning.

Standard 4 : Students can be considered performance consist of 3 indicators.

4.1 Average achievement level of the students after three years has ability to think systematically.

4.2 Average achievement level of the students after three years with the ability to think creatively.

4.3 Average achievement level of the students after three years with the ability to solve problems.

Standard 5 : Student Achievement on curriculum is comprised of 8 indicators.

5.1 Average achievement on three year retrospective in group learning of Thai language in grades 3, 6, 9 and 12.

5.2 Average achievement on three year retrospective in group learning of Mathematics in grades 3, 6, 9 and 12.

5.3 Average achievement on three year retrospective in group learning of Science in grades 3, 6, 9 and 12.

5.4 Average achievement on three year retrospective in group learning of Social Science in grades 3, 6, 9 and 12.

5.5 Average achievement on three year retrospective in group learning of Health and Physical Education in grades 3, 6, 9 and 12.

5.6 Average achievement on three year retrospective in group learning of Art in grades 3, 6, 9 and 12.

5.7 Average achievement on three year retrospective in group learning of Career and Technology in grades 3, 6, 9 and 12.

5.8 Average achievement on three year retrospective in group learning of Foreign language in grades 3, 6, 9 and 12.

The internal quality assurance system for external quality assurance system differences and relationship links. Internal quality assurance processes in education, and the agency will be conducted as part of the administration by all staff in schools to improve access to quality education, educational standards and prepare the annual report to stakeholders. The external quality assurance is a continuous and relevant to the internal quality assurance. Investigated the effects of self-evaluation of schools according to a study by an outside agency to provide feedback to improve quality continuously. Quality assurance to insure you outside so closely linked with educational standards with regard to the policy principles is unity. Diversity in practice and to promote the development of quality education rather than to control or to blame. The external quality assurance or external quality assurance needs to have a basic information system to assist in monitoring supervision , monitoring and evaluation .

Standard of basic education in ensuring the quality of education both within the Office of the Basic Education Commission (OBEC) and external quality assurance on the third round of the Office for National Education Standards (ONES) researcher interested in the desirable consistency, the ability to think critically reading and writing achievement, the information to measure and evaluate the teachers in the classroom for the information technology learners in quality assurance , including evaluation of desired characteristics of learners with 8 questions are 1) Patriot religious king 2) Honesty 3) Discipline 4) Eager learning 5) Strategically located suffice 6) Committed working 7) Love Thailand 8) Public Mind, assessing the critical thinking , reading and writing . The Core Curriculum B.E. 2551 requires the evaluation of four levels: does not pass through the good and the great. And assessment of student achievement by considering the learning level course is divided into eight levels 0, 1, 1.5 , 2.0 , 2.5 , 3.0 , 3.5 , 4.0 in the elementary curriculum the assessment by year. The secondary curriculum evaluation semester.

3. Monitoring, Supervision, and evaluation in basic school.

Monitoring means to measure the output of the process compared to what we set out. (Office of the Basic Education Commission, B.E.2554), such as checking the validity of student scores.

Educational supervision refers to the process of developing and improving the quality of education. Cooperation between the supervisors and the supervision. Guidelines of democracy that focuses on providing help and guide recipients admitted to the supervision of management education such as teaching supervision.

Measurement refers to the number or symbol, instead of quantity or quality of things like scoring metric such as scores from student test.

Evaluation refers to judgments about what the needs assessment. Based on criteria consisting internal criteria and external criteria, such as grading from testing scores.

From the definitions, they appear that the data and information for use in monitoring supervision, monitoring and evaluation of the learning, separate into the works of school are as follows:

1. The data and information in the measurement and evaluation work consists of
   1.1 Student's formative and summative reports.
   1.2 Evaluation of students' desired characteristics.
   1.3 Assessment of students' ability to think critically, reading and writing.
   1.4 Information about subjects and course Description.
   1.5 Data of standards and indicators learning courses.
   1.6 Evaluation standards and indicators of student learning courses.
   1.7 Student attendance in each course.
   1.8 The summary of studying in each course.
   1.9 The summary of student activity.
   1.10 The roster of students enrolled.
2. Data and information in academic affair work.
   2.1 History teachers and administrators of educational institutions.
   2.2 Teaching schedule in every classroom.
   2.3 Instructors to enroll and evaluation student activities.

2.4 Calendar of the activities of the school.

2.5 Data and reports of student absence in every classroom.

2.6 The desired characteristics results of students.

2.7 Summary of the student's ability to think critically, read, and write.

2.8 Reporting of student's assessment all subjects in each classroom.

2.9 Final reports performance in all subjects each classroom.

2.10 Reporting Achievement individually courses and classes.

3. Data and information in the registration work.

3.1 Number of students and student's statistics classify by class.

3.2 Cumulative grading record (PP1).

3.3 Student's certification paper (PP2).

3.4 Reporting graduates in each educational level (PP3).

3.5 Reports the results of each student in desired characteristics (PP4).

3.6 Report of student development in each subject (PP5).

3.7 Report of each student development in every subject (PP6).

3.8 Student's certification (PP7).

3.9 Report of student cumulative recording (PP8).

3.10 Report of the student individually standard metric in all subjects (PP9).

4. Data and other information in this study should include.

4.1 School Information.

4.2 Student information.

4.3 Administrator teacher and educational personnel Information.

4.4 Number of students per teacher, Number of students per class.

4.5 Statistics Number of students, teachers and classrooms.

4.6 Results of learning classify by the subject and the class.

4.7 Grade point average and percentile (GPA / PR) in 8 group learning.

4.8 Report of student individually development. (Grading Online)

4.9 Achievement in each courses.

4.10 The student assessment in desired characteristics, thinking, reading, writing and development activities.

4. Concepts, theories, information system development.

Definition of Information Systems refers to a system designed to collect information. Preparation of information and support to individuals or departments within the organization to use the information contained on them. The system may be done by hand, such as storage in the form of documents , the preparation is very simple , but there is a distance limitation lot of time. A simple mistake, searching can be difficult and delayed at present. With the advancement of computer technology, to assist in the development of information systems (Computer-Based Information System: CBIS) , because they can store data in the large volume. It also provides analysis and processed quickly. It can reduce the amount of paperwork duration of storage and can cut people down when compared to the hand made. For this reason , the current system has led to the widespread use of computer technology .

Information system development to create new jobs or modify the existing system to work with the computer. The database is used to produce the information needs of the user. Those associated with the development of most systems are the systems, programmer and the users (Nidtaya patsonsiri and Kanya pulotaganone, 2548).

Elements of information systems comprised of 4 major components.

1. Inputs, data which is fed into the system for information, the facts that have been collected and to organize information in preparation for further processing.

2. Processing is the process of changing data into the desired results.

3. Results, output of the system will come in the form of information include the report documents a computer screen. As needed, which may be an exit in the form of text, tables and graphs.

4 . The feedback of the results obtained is fed back to the input to further processing, such as the results come out. Information may be sent back to the user with some additional analytical data to provide more details.

Administration and Management Information Systems consist of information systems, Major classification systems into five categories: (Center for Knowledge Management. PESAO. Ratchathani District 4 [online], January 7, 2555. Sources http://202.143.156.4/edplaza/).

1. Systems transaction processing (Transaction Processing System: TPS). TPS is seen as the lowest system. The purpose is to provide for the daily operational level accuracy. Efficient and more productive, like the computer to help in the accounting records help to print order form Bill of Sale products help out to record amortization, help save the goods from the warehouse, and etc. Examples of TPS such as general ledger, accounts receivable system accounts payable accounting system and payroll systems, and etc. In conclusion, the data processing system, TPS will focus on a specific task or specific departments only. The objective is to enable employees to perform daily tasks more effectively , that is faster and more accurate. Labor and fewer people, It does not focus on the advantages to a business decision, so TPS systems or transaction processing systems , it is referred to as the information systems laboratory.

2. Systems management information (Management Information System: MIS) while the system is processing TPS highlight specific information or a specific department. But management information systems or MIS system is a system that combines multiple information systems , which is a sub-system of the organization together as an accounting information system,. marketing information system, human resource information systems, and information systems, production, and etc. That is to want to create a database in each party or each department. Mutual benefit can run as needed. By various subsystems to take advantage of the same database file system is bringing out various tasks included in the same database. By storing in a way that any user can run it. Facilities as required. This is to avoid storing redundant system different sub because sub-systems were originally collected the data in their agencies. All the same information, such as information about the inventory to keep the inventory control department, purchasing and production departments redundancy and may cause discrepancies. It also consumes storage costs as well, so when a database system can eliminate these problems.

Database is a critical component of the MIS system, ie MIS system will be focused on sharing information between various parties can take the information from the system TPS system of various sub attributed the result is information to use. Management decisions as may be taken documents from TPS of the inventory, production and account, and then processed into a report to management by results (Output) obtained from TPS to the input data. (Input) MIS system that data into the MIS system would have many benefits. Including information on non- trade items with reports or information from the MIS system will include financial information. And nonfinancial information It can be utilized in determining both the operational control of the management and control of the management of middle managers. It can also be useful in planning for senior management as well. But in general MIS system will be utilized to focus on the decision of most middle managers. It can be seen that the MIS system was developed to produce the information needs of executives more than TPS aims to present reports to management to management for use in decision making at the time. TPS focuses on support to the daily operations of staff efficiency

. **3. Decision support system (Decision Support System: DSS)** is an information system that focuses on providing information for decision support to executives as well as MIS system but DSS will focus on decisions made statements specifically and high level of uncertainty by having the capability of modeling the decision (Decision Model) in the results of the various alternatives. If this decision is made, the result will assist management in deciding the best option or appropriate DSS system that uses information both from within the organization (from TPS and MIS) and from outside organizations, such as the selling price of the competitors. Common stock present in the DSS system has flexibility in its use. And flexible than the MIS system administrators can change the variables to find the results of with a computer is able to calculate the new result that only takes a few seconds only, so the system DSS will be helpful in deciding the ad hoc system, DSS also particularly useful for the planning of senior management because DSS is a tool, allows executives to analyze how the environment variables are changed. The results will come out soon administrators will be able to set policy and alternative or adapted to the changing environment appropriately.

4. Systems experts (Expert System: ES) system is another system that is designed to help executives make decisions, especially in matters that are complicated. Executives had little knowledge of the matter and other information systems, decision support systems can not provide. It is a subject that requires expert knowledge in the topic to help in the decision-making system ES is an information system that contains knowledge and advice from experts in various fields by storing the information in the knowledge base. When the administration will make a decision on any matter, it can retrieve the information, knowledge and advice from the experts on the topic of knowledge such systems ES will help guide decisions for or make decisions for the system ES is. Functions similarly to a specialist by the computer acting human enough but unlike computers are advised not limited to matters that are stored in the knowledge base only.

5. Information Systems for Management (Executive Information System: EIS) EIS is the highest. By results from other systems to be input to the EIS system, this system helps in monitoring supervision, monitoring and evaluation, as well as decisions on the management.

Information system mentioned above. Be seen as information systems for practice (TPS) is the lowest, that is, the results or output (Output) system TSP is input (Input) of other systems, and the information systems executive (ES) is the highest, since it is a system that helps meet the needs of most executives.

Concepts in the development of information systems used in the development of information systems (Pratheep mehtakunawut , B.E. 2544) is the prototype system development started from the users who know the problems and the opportunity to solve problems using information systems. Just rely on the system designer only. Step in the development of the system.

1. Users tell the basic requirements of the system about the desired results.

2. Developed the first prototype to create a system that will be used and meet the basic needs of system users. Developers to design, build, system programming or software in order to get some results. May not complete all and delivered to the trial. By

not taking into account the performance of the system. The purpose is to allow users to accept the system.

3. Experiments using prototype to provide users with the opportunity to use the system to understand the information they need. And understand the working of the system. If problems are found , they will be updated and made changes to the new master . The intended users to achieve maximum satisfaction.

4. Promptly update the master by changing the system design based on user needs. And therefore to improve the program to the next trial . The program will be updated and developed a new model to another.

Systems Development Lifecycle (System Development Life Cycle: SDLC).

Systems development lifecycle of information systems. It was invented by a procedure different from the circuits for general systems . This is a step in the system development process that follows is whether to 7 (Williams and Sawyer, 2010).

1. Finding problems, opportunities and goals (Identifying problems, opportunity and objective).
2. Studying the possibility (Feasibility studying).
3. Analyzes system requirements (Analyzing system needs).
4. The system design (Designing the recommended system).
5. Development software and documentation (Developing and documenting software).
6. Tests and maintenance (Testing and maintaining the system).
7. Implementation, and evaluation. (Implementing and evaluating the system).

Each topic details are below:

1. Finding problems, opportunities and goals system will occur when administrators or users need to realize that information systems to correct or improve the existing system. The following steps:

1.1 The analysis and design to study the detailed system, to understand the problems in the enterprise.

1.2 Try to find opportunities to improve the way it works by using a computer system.

1.3 The analysis and design need to provide clear goals, to know the direction of the system to meet goals such as the need to compete with competitors in reducing the costs of production. By reducing the amount of inventory, so analysts and system design. To see the problems, opportunities and goals in the computer system used to store data into inventory. And processing the raw materials and so on.

2. Study the possibility.

2.1 Determine where the problem is and decided to develop a new system or improve existing systems is possible or not. The cost and minimal time.

2.2 The analysis and design must give them that solving the problem.

2.2.1 There is a possibility that technical or not, a number of computers that are adequate. Software fix it?

2.2.2 There is the possibility of human or otherwise have the right person to develop and install the system. User opinion on the changes.

2.2.3 There is the possibility of economic or not, have investments or expenses in analysis and design. The cost of the time required for system development.

3. Analyzes system requirements.

3.1 From studying the function of the original system, How does it works?

3.2 The requirements of the new system.

3.3 Tools : Data Dictionary, DFD, Process Specification, Data Model, Prototype.

3.4 Personnel and functions : Users must cooperate.

3.5 The analysis and design documentation available. The study was to understand the working procedures of the system.

3.6 The analysis and design of the reporting requirements of the new system .

3.7 The analysis and design work diagram (DFD) of the original system and new systems.

3.8 The Analysis and design build prototype first.

4. Designing the Systems.

4.1 Design new systems to meet the needs of users and administrators.

4.2 Personnel functions:

4.2.1 The analysis and design of hardware and software decisions.

4.2.2 The analysis and design of information systems design, screen display and the database design.

4.2.3 analysts and system designers determine the number of personnel in the system.

5. Development software and documentation.

5.1 Programming, manual, and training users involved in the system.

5.2 Personnel and functions :

5.2.1 Systems analysts design system, preparation and installation system.

5.2.2 Systems analysts design planning, control programming.

5.2.3 Programmer programming

5.2.4 Systems analysts design and control to write manual and training.

6. Tests and maintenance the System.

6.1 Analysts, system design and testing program.

6.2 Users to check that it works as intended.

6.3 If an error occurs in program then update.

6.4 When testing program does not meet the requirements, it needs renovation until the user acceptance and system test.

6.5 Maintenance, most of the editing program may be due to a problem in the program (Bug). System requirements increased reported increased hardware and software changes as user demand has increased.

7. Implementation, and evaluation the System.

7.1 System installation.

7.2 Introduced a new system to replace the old system.

7.3 Using the new system in parallel with the old system for a while. See results that match or not then the new system.

7.4 Analysis and design evaluation to get the complete satisfaction of system users or what to edit, update or problem issues.

Details of the system development cycle above is shown in the following image.

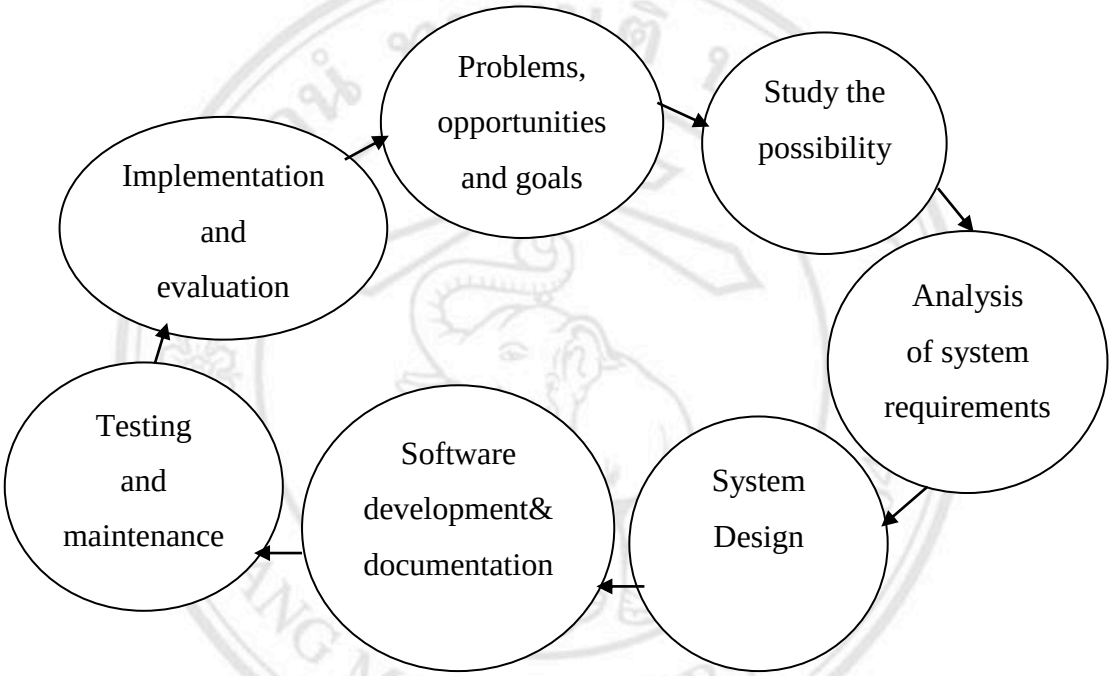

Figure 1 System Development Life Cycle : SDLC

Guidelines for Information Systems Development (Kenneth & Laudon, 2002), there are 6 steps.

1. Analysis system mapped the old system. Analysis of the problem. The document verification practitioners interviewed then define the problem and offer alternatives where possible to think of a new system.

2. Designing systems consists of the preparation of data flow diagrams (Data Flow Diagram) Modeling (Logical Model) and developed into a physical form (Physical Model). Technology devices, software, data modeling, report design, screen design of the user interface and dictionary information (Data Dictionary). Steps are as follows:

2.1 Design Report (Output Design).

2.2 Screen design (Interface Design).

2.3 Design input and model data (Data Flow Design).

2.4 Layout design system (System Flowchart).

2.5 The design of the database (Database Design).

2.6 Prototyping (Prototype).

3. Programming (Programming Stage) create command to create a new system by using appropriate language can be monitored and modified as well as creating documents.

4. Program testing (Testing) is a process of trial, prior to the operation. By creating information mocks and check the accuracy of the program. If it finds an error, it did not examine the second part is to verify the written form (Syntax) and monitoring objectives that match and training to use the system.

5. Systems installed (Implementation) by providing equipment. Installing the operating system and application development. Implement the new system and preparation of the manual.

6. System Maintenance (Maintenance) is a procedure to check, improve after installation and using. Because of the potential problems of using the program (Bug), which must be corrected immediately. To add or arise out of user modules (Module) in the extra work.

Description of Systems Development Information above is shown as figure 2.

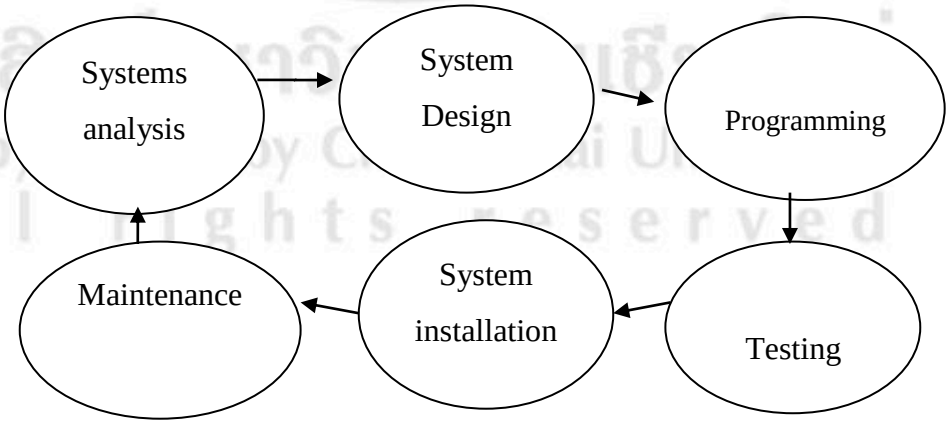

Figure 2 Information System Development

5. The preparation of information systems in schools.

Preparation of information systems in schools. Factors can help schools to develop information effectively. By the preparation of information system quality (Ministry of Education , B.E. 2544, P.8), there are accurate, reliable and up to date. Users can respond timely. This classification is devided into 5 basic educational information systems. Information about the Learners, Information System Academic, Administration and Management Information Systems, and Reporting Information System.

The Information Management System of Education. It is important and necessary to perform quality assurance of educational institutions. To achieve the goal of improving the quality of education as standard requirements. And comprehensive task management with quality. Schools must have system administration and management. That contributes to the quality of the students. The information system is efficient , accurate , current and complete information can be run at any time. The administrators can use in the decision processes. The internal quality assurance system to study effectively.

There are 2 importance factors in the implementation of information management systems which are to get quality information and to plan the development of educational institutions to meet the academic standards of the institution. Those involved should study the concept and implementation of both parts together to provide consistency and optimization of management and management education. To support both internal and external quality assessment.

Management information system step would be the main 5 steps: 1) gathering data, 2) audit, 3) data processing 4) Presentation of data and information, and 5) Storing data and information. (Ministry of Education, B.E.2549, P.24-26). Each step is detailed below.

1. Gathered to collect data from various sources , it must define a list determining how the information they need to store. Create or supply storage in accordance with the nature of the information and data sources such as surveys , interview questionnaires, recording observations, etc. Being scheduled in the store or

being responsible for storage must be mindful of the data and must meets the defined requirements and reliability. To define a list of information that needs, the students may take part in educational standards in the quality assurance system of education. There should be the standards to evaluate the quality of basic education within the Ministry of Education. Educational standards for external quality assessment of the threshold. Standards-based learning curriculum for Basic Education B.E. 2 5 5 1 then determine methods and tools for gathering information to determine how consistent the collected data. The instrument used was a questionnaire or a way to gather data by observation. It should be noted and so on.

2. Data monitoring. The data before collecting has been checked the accuracy of the data. By considering the accuracy, completion and current data.

3. Data processing step is to import the data into information processing or to change the data in a format that can be used to advantage and be available. It will be grouped according to the nature and type of information to digest. This process may be categorized and sorted through the enumerator to use mathematical formulas. The operation may take a very simple method called handmade using calculators to help small until the technology is computer. Data analysis should be the simplest and most direct way. The commonly used statistics such as percentages, ratios, proportions , mean, standard deviation. Even the frequency distribution or statistic is a measure of the easiest.

4. Presentation of data and information. Data that have been processed or prepared information with clear definition. A compact needs and easy to implement. May be present in the form of tables, graphs or diagrams to describe the composition depending on the appropriateness of its use and the nature of the information itself.

5. Collection of data and information. store both on the part of the data and information in various media with easy search system to be used. Storage can be stored as files, documents or electronic files as potential of schools regardless of the search system and facilitate change. Update the current Importing data to new processor including the information to be used in various applications .

Schools with complete information system that is currently known and convenience needs . To help schools improve the quality of education has improved

operational efficiency and effectiveness . To ensure that sits on a foundation of evidence and facts that can be verified. The analysis the scientific process is reasonable. Because all the information that will be used in the planning , implementation and decision then led to the development of the concept . And create new options to perform various.

Management information system can be classified into 3 systems by operations. they can be summarized as follows (Brian K. Williams and Stacey Sawyer, 2010).

1. System made by hand (Manual System) is a system that stores documents using different styles, this system has many advantages. It is the least cost, the disadvantage is run the inconvenience and missed forecasts. If a system file is not suitable as they should.

2. Semi-automatic (Semi - Automation) system is used for the part. And mechanical part that is attributable to the documents made by hand , and the creation of information systems using computer-aided . This system has the advantage, the cost is not high personnel training. But there is a downside if the document format inappropriate, operational inappropriate. The operation will be delayed if the information is filled out paperwork error. This system will be good when it is done by hand including a complete, accurate, complete control inspection well.

3. Automation (Full - Automation) is a computer operating system used . This system has to be designed into the job because computers are built to look and size of different schools. However, whether large , medium or small , urban or rural, most computers will help in the preparation of the document. Schools should use computers to their full potential for organizing information system that is accessible, timely, accurate and completed in all situations. The quality of such data and information . The process of improving the quality of education in various fields of study to be conducted effectively.

Management information system components in schools. The system consists of several sub-systems. Each system has a specific purpose, structure and mechanisms for their specific function which will contribute to the objectives of the study. The

education is a key component subsystems within the following 5 components (MOE.,B.E.2549)

1. Inputs or the needed resources to contribute to the system and cause such materials to students, teachers, curriculum, budget, facilities, technology and so on.

2. Processing process of conversion into productive resources , including the instructional process, management process, and management information system process.

3. Productivity or output is what needs to happen with the objectives of the system include students who graduate with the knowledge required by the course, student satisfaction , parents and teachers, etc.

4. Feedback is used to control the operation of the system according to the purpose. To point out the advantages and shortcomings of input, process and output, which will lead to improved, so as to obtain the desired quality and achievement of students. The performance of teachers and educational personnel, quality assessment.

5. Environment is a common condition of the surrounding context or organization, including the organization of a community, parents, and so on.

From the text mentioned above concluded that the preparation of information systems and information technology in schools. Effective should do a system ie data entry , processing , and production information as needed. Technology should be used to help in the process. To the system are processed automatically. Thus reducing redundant work. The accuracy of the information and speed of search and data processing to obtain the desired information.

6. Database Management System

Database management systems program facilitates database management. The Ministry of Education (B.E. 2549) has given meaning. Define the following rules.

Databases means a collection of data was collected. One database may have data files (Tables), only a single file or multiple files data. The key is to create relationships between records. To eliminate redundancy of data and store these data files in a central hub. In order to bring this information to be shared. Maintain control when they want to work and the right to use that information to extract the required data

is available. Some information may share with others but some of those who are authorized, it will be available.

Data management data is the fact that the emergence of any activity by observing the activity of the recorded interview and questionnaire. The data acquired is still as raw data. Unable to be used in deciding on an action oriented management, and data gathered, usually no organizing might be a repetition of the same kind of data or information that may be conflicting. Therefore, organizations must have a plan to manage the database and better information to benefit from being organized.

DataBase Management System or DBMS. DBMS software is like a mediator between users and applications related to the use of the database. Its function allows users to access information easily and efficiently. Access the user's data may create a database. Database Editor or asking questions to obtain information. Users no longer need to know about the details of the database structure. It is like a mediator between users and applications related to the use of the database. Popular database management systems is in use today, including Microsoft Access, SQL Server, Oracle and MySQL.

Advantage of database management system are as follows:

1) **Reduce the redundancy of data.** As usage of the database, the database must be designed so that there is minimal duplication of data. The primary purpose of the database design is to reduce redundancy. Reasons to reduce redundancy due to the difficulty in updating the data. When the update is completed , This is because the same data help collect several units and space to store data.

2) Maintaining the accuracy of the information. The database management system can monitor the rules governing the accuracy of the information. By applying those rules into the database. A function of the database management system can manage the accuracy of the data, instead. However, if a file system developer to write programs to control various rules (data integrity) that covers all the programming rules were not complete or missed some rules may have made an error. It also reduces the cost of maintenance and development program. The database management system manages itself. The database management system will support the use of multiple users simultaneously. Thus, the stability and accuracy of the data, so it is very important and

must be controlled so well because users may change their information. This will cause errors affecting the data of all other users.

3) Independent of the data. Because the concept of how the program is independent of the data structure. Nowadays, if you do not use the database to modify the data structure, it will not affect the program which is due to retrieve the information stored in the file system data. Be used to run programs written in a data file.

4) A high level of data security. Most database systems will have the security of data as the user ID and password to access the database for each user. Database system to obtain the name and password of the system are used to work in the relevant section only. By preventing other users who are not allowed to see or edit the information that you want to protect, create, and manage tables in the database. Either to increase the suspended the use of its users, and allow users to browse more delete and edit data or part of the data in the table is allowed. Database system can determine the visibility and use of the various users. The level right and authority to use the information.

5) Share information with centralized control. Controlled using a central database. Database system can support the work of different people. That is, the database must be controlled in order to work properly, such as when users are editing the data in the same time. It will not allow users to change data. Since the data into the database will be imported by the system, it will be operated as sub-divisions of the organization. Each agency will have the right to manage the data unequally. Database systems to manage the agency shall use any database management system. Who is the leader of input? Who has the right to edit and who has the right to retrieve the information? In order to give the correct permissions on the table should be used, database will tell you what information is stored in the table name. When asked by the administration to be able to find information to answer questions immediately using a very powerful database language is SQL, which can answer questions that arise at any moment one . Associated with the database immediately without the need to write programs.

Designing Databases is critical to the database management system (DBMS) because the information contained within the database is to study the relationship of the data. Structure of the data access and application processes to run the database, so we can share how to create a database with 3 types.

1. Hierarchical data model. Hierarchy or Hierarchical data model, how to build a database. Sequence data was developed by IBM in 1980 was limited popularity. To develop a database on a computer, large and medium. It will create a data structure like a tree. The relationship is one-to-many (One-to-Many) Advantages and disadvantages of a hierarchical structure is able to relate to depictions of each sequence segment that is the root. Or a parent and either a segment or a dependent child. The disadvantage of this structure is less flexible. It needs to start reading from the first segment to the root. In addition, the database designs information to be careful repetition of information.

2. Network data Model. Database network is similar to the Hierarchical data model. Hierarchical data different network structures. There may be many-to-one correspondence. (Many-to-one) or many (Many-to-many), that is, the Child may have parents over the advantages and disadvantages of network structures. Each type can be run by said network. The duplication of data is much less, because the record member can use to share information.

3. Relation data model. This model is a design database organizes data in the form of a table with a file. The data rows of the table represents a record section perpendicular to the columns. The scope of the data Field, where each table is created to be free. Thus, a database designer must have a plan to table the information required. The database contains a table of a company employee. Department and project schedule data table show employee table and department table project. Advantages and disadvantages of the relational model are to create a new table based on mathematical principles and find that the data in the database table data with rebuilt or not. If so, to further improve the process by reading or cancel downside is the study of how to program and use the database must be based on the mathematical theory, making further studies of its users. Difficult to understand but today there is a program to create multiple database applications that are trying to make it easier to learn and use the program to create a database using the language.

7. Organized way to develop a computer program.

Development of computer program from the study documents Thanawan punkao and Tanawon junrattaratpaipoon (B.E. 2537), Kunchit malaiwong and Wichit punnawat (B.E.2532), Watcharaporn suriyapiwat (B.E. 2537) and the research of Tweesin kulnapa dl (B.E. 2538), A summary of the steps in the software development, There are 7 steps (Refer to Patcharin saehair, B.E. 2544, P. 23-27) as follows.

1. Problem Definition.
2. Problem Analysis.
3. Program Design.
4. Programming.
5. Program testing and Debugging.
6. Program Documents.
7. Program Evaluation.

Details of each step are as follows.

Step 1 Problem Definition.

To develop programs to identify issues that needs study. Once you know the problem to study the scope of the problem description and factors related study and to define the issues clearly.

Step 2 Problem Analysis.

Analysis is analysis Consider the following order:

2.1) Required results to let the computer do the work. This separate writing is clear, based on what you like to solve the problems.

2.2) The pattern of results to study the characteristics of the output format or profile that you want to display on a computer screen or printed on a printer. The analysis of the results must match the needs of the user. To get a clear understanding of your destination. Scope of application and figuring out how to get to the desired result.

2.3) Input data must consider the nature and format of the data in order to get the desired result. Including the procedure for processing.

2.4) The variables used to define the meaning of the various aliases for ease of reference and programming. Naming rules is to be named after the naming of the computer language used to write programs . And so are similar in meaning to the word instead.

2.5) Processing method Demonstrate the process from receipt of data into a variable show the step by step sequence continues in order to get the results desired format.

Step 3 Program Design.

Program design defines the processing sequence. There are many ways, such as the way to write algorithms that describes the performance of each stage with a word or phrase to convey simplicity or pseudo code is a sentence similar to the command of language of writing flowcharts which represents the operating procedure, etc.

Step 4 Programming.

This design process is changed into a computer language commands. The choice of language is to suit the type of work, the limits of your computer and tailor-made translations available. Writing correctly according to the rules of the language. They also have to consider the aptitude and ability of the programmer.

Step 5 Program testing and Debugging.

To check the validity of the order or a written program and correcting the error. bugs still can not provide the desired result. An error occurred can be two types.

1) Errors caused by writing the command code is invalid according to the syntax of a computer language. It is called syntax error or coding error which the compiler can report this error.

2) Errors of logic or the logic error is an error that was not the intended outcome of the work. This can be checked by using the testing data or the data that can prove whether the program is working correctly while operation. The results will be consistent with the known answer.

Step 6 Program Document.

The preparation of program documentation to facilitate the user application. It should be prepared and compiled with programming. In general, there are 2 types.

6.1) documentation for users consisting content.

6.1.1) Details the range of applications.

6.1.2) Description of data used with the program.

6.1.3) The details of the results of the program.

6.1.4) Description of commands that are used to make the program work.

6.1.5) The details of the interaction between a user and the application.

6.1.6) The meaning of the information displayed.

6.2) Documentation for programming. Programmer's documents are useful to improve the program in the future, contains content

6.1.1) The descriptive parts used in the program is indicate that the application process works.

6.1.2) Description of the different techniques used in each part of the program.

Step 7 Program Evaluation.

Assessing the quality of programs developed to evaluate 2 approaches.

7.1) Evaluated by application developers. An evaluation of the system within the program (systematic internal review) by evaluating different aspects as follows.

7.1.1) The ability to assess whether the program has the ability to work as stated in the objectives of the development program.

7.1.2) The accuracy of the program to assess whether the program works exactly as the manner specified requirements, such as the input data, pattern of results.

7.1.3) The reliability of the program to assess whether the program runs two times to the match.

7.1.4) Prevent malfunction of the program to assess whether the program, when an error occurs, continues to run normally or return to the new data.

7.1.5) Speed of processing measured by the running time in the program each section since its inception into the program until the desired results.

7.2) Evaluation program by the user. An evaluation program in application user feedback in various users rating divided into following aspects.

7.2.1) The documentation for the program is evaluated in terms of clarity, and consistency of this manual with the program.

7.2.2) The form of the program, an evaluation of the operational data of the application is to display and process applications.

7.2.3) The effectiveness of the program results are achieve and benefits.

The development of computer is using of computer languages, computer programming and applications to any one in particular. Application Programs currently are classified into 2 types.

1. Language used to write to the OS (Operating System Base Application), such as in Windows or Unix Base which language written on one operating system. After translation process, Program can not be applied to the operating system.

2. Languages on the Web (Web Application) is a computer language development program through the web page. Users can use a Web browser as Internet Explorer, Firefox, or Google chrome to run the program without limiting system performance.

Details in the process of developing software show in figure 3.

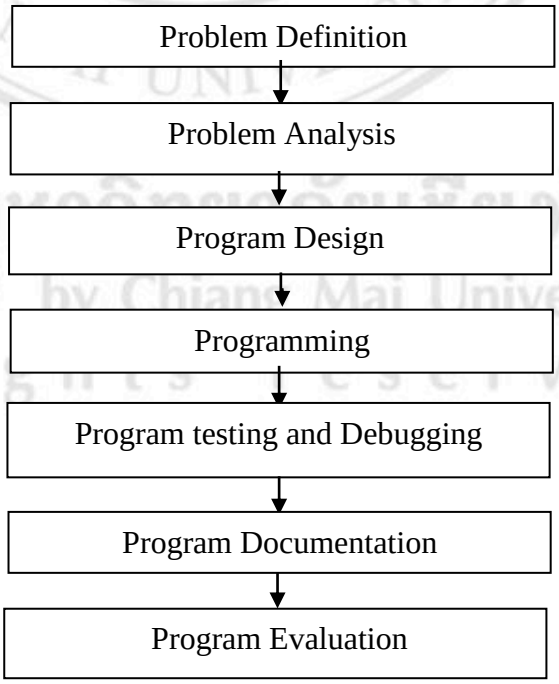

Figure 3 Diagram showing the sequence of steps to develop a computer program.

8. Research and Development in Education.

The definition of R & D (Research and Development).

Research and development means study to design a new product or process evaluation tests , field systematically. And revised until found effective quality standards or defined by the conditions (Borg, WR, 1987).

A research and development (R & D Model).

Format is a widely used in research and development. Oriented style system (system approach model) was designed by Walter Dick, Lou Carey, and James Carey. Model shown in figure 4.

System Approach Model of Educational Research and Development (R & D)

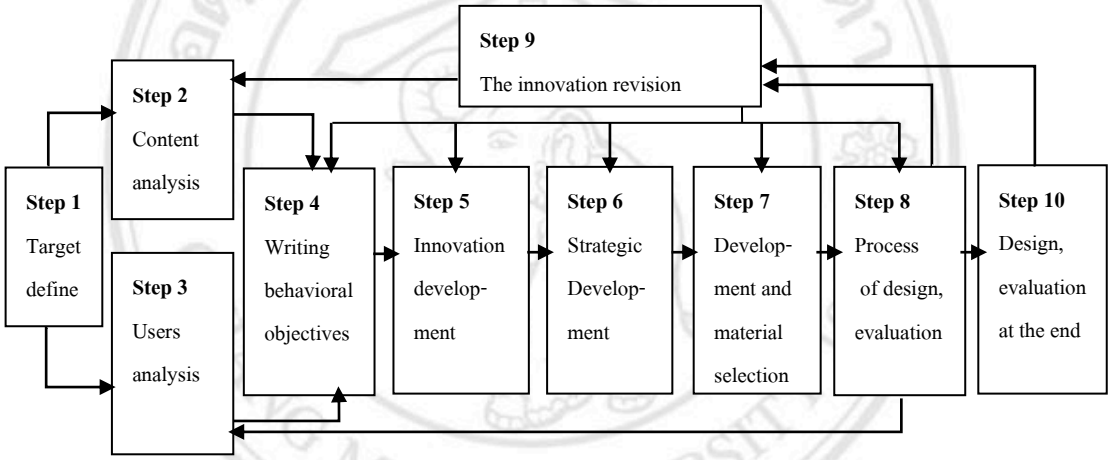

Figure 4 Form a system of research and development.

Source: updated from Figure 6 page 552-1. (Dick,W.,Carey, L.,& Carey,J.O. ,2005) The Systematic design of instruction (Edition 6), New York;Allyn & Bacon Published by Allyn and Bacon,Boston,MA. Copyright 2005 By Pearson Education.

Illustrated with 10 steps in the cycle of research and development.

Step 1 Targeting features of the innovation or product and determining needs.

Step 2 Content analysis by assigning a specific the process of learning the skills involved

and accomplish the objectives.

Step 3 Design and the knowledge of the user. The skills and the attitude

of the installation and features the new knowledge and skills to be used.

Step 4 Translation needs and goals of a specific innovation. Behavioral objectives meaning to the goals of the innovation or media. Product is different, stakeholders. Furthermore, innovative planning arrangements in actual conditions, strategy and materials required.

Step 5 Innovations and tools as true environment, they should be correlated between knowledge, skills and behavioral objectives.

Step 6 Develop innovative strategies to help learners or users to achieve behavioral objectives.

Step 7 Development tools. Including print training manuals for teachers. Or preparation of teaching aids such as interactive video types. If the strategy involves teachers to prepare in teaching exercises or instructions to the user.

Step 8 Designed and conducted to evaluate the use of innovation.

Step 9 Innovative improvement.

Step 10 Design and evaluation at the end of the innovation.

Assessment in processing and end process.

Chris Bowen (Scriven cited in Borg, WR, 1987) have created a checklist of 12 items to assess educational products and educational innovation. Conclusion of the following questions using the scale and level 4 in each of the following.

1. Needs of product.
2. Importance of products on the market.
3. How to be a trial product thoroughly.
4. The trial is a good result or not in all the trials.
5. Analysis , production cost is.
6. Evidence to show that the product is effective in the long run.
7. Effects of researching products or not.
8. During the product development process affect ethics, specialization, standards.
9. Research design was used in the experiments is sufficient to determine product is effective or not.
10. The competition is fierce, when comparing the product and the competitor.

11.The appropriateness of the statistical analysis of the tests in the field.

And the statistical significance or not.

12. Products affect in education a lots.

Differences between educational research, research and development in education.

Educational research on educational research and development are two different things (cited in Gall, Meredith D., 2007:35).

1. Purpose of educational research. We search for new knowledge but the purpose of research and development work was completed when the output is used effectively in an educational program or job. Output is in the form of a manual. Audio-visual materials training guide and educational tools. Productivity may be combined into one integrated system to manage the education of children.

2. In educational research. The researchers start by developing a hypothesis. Or problem studied After that, researchers will study literature . Sample Data collection were used for statistical analysis and a summary of findings to the research hypotheses. However , research and education differs from number mentioned above. By considering research in the field trial.

Process of research and development. Sequence is as follows:

1) Develop behavioral objectives with specific characteristics. Or show that the product works or if the product is successful examples of new courses. Researchers to determine what knowledge, skills and attitudes students need to receive for the course.

2) Conducting research or reviewing documents and related research based on the product. Search the defect of the product currently in use and customize the solution to the defect.

3) Development of new products and pointed out that the objectives are realistic.

4) Testing by installing the applications and performance evaluation purposes, prepared products.

5) Update fixes of information received on trial in the field.

6) Repeat steps 4 and 5 until the product development objectives. Or until the use of the product without defects.

7) When the product is successful then the product is to use. In this process could be developed and tested further. In order to train personnel in the use of the product.

Research and development of educational needs. High costs and a strategic educational development at the time. But a strategy that reduces the gap between research or research in the classroom. Moreover, the emphasis on scientific assessment helping the school to have a product proved to be highly effective, can be simply and fast used in the school system.

Research and development Cycle (The R & D Cycle).

Research and development cycle created by the teacher in the laboratory of the Far West Laboratory, which is one of the 10 states of study has been supported by the Office of Education in the United States to develop through research and education. The development of educational programs called Short-term training courses to develop teachers' skills in teaching in the classroom.

Curriculum development, short-term training to first visualize the cycle of research and development summary of product characteristics in the course of a short training course takes about 15 hours of training specific skills, it will be taught primarily by classroom control through the medium of film. The demonstration of skills training in the form of a movie to situate in the films presented in class and management style of the teacher after the training, planning, exercises to give participants skills. The application was presented to small groups of students and to do exercises using video media at the end of the exercise participants critical skills. Participants are learning this exercise is called exercises to teach small group (Microteach lesson) because the situation in a regular classroom can be coupled both time and number of students. Evaluation of the recorded video of the course participants. Planning exercises taught in the same and apply to other student groups and videotaped it. It was critical, and so on, until the exercise is complete accuracy. So to do the teaching in the next exercise was better.

Sequenced using cycle research and development are as follows (Borg, 1965:627).

1. Collection Information and Research (Research and Information collection) a literature review. Classroom observations and report preparation.

2. Planning as well as the skill set required. The objective in each case sequence of courses and tested in small groups as possible.

3. Develop preliminary form or product as well as the preparation of teaching materials, manuals and assessment tools.

4. The preliminary field testing is the step 1-3 to the school. Using a questionnaire, interview, observation classes 6-12 subjects collected data and analysis.

5. Main product revision improve product quality by recommendations from the results of previous trials in the field.

6. Main field testing is used in the school cafeteria and classes 5-15 30-100 study collected quantitative data in each subject before and after the trial. Evaluation by objectives compared with the control group until it is satisfied.

7. Operational product revision to improve products based on recommendations of the evaluation in the field.

8. Operational field testing is used in the school cafeteria and classes 10-30 40-200 interview subjects noted questionnaires to collect data and analysis.

9. Final product revision to improve products as recommendations from the results of laboratory experiments in the field.

10. Dissemination and distribution to report on the development of products in the expert monitoring and articles published in trade journals. Track distribution to handle quality control.

From the description above, This procedure is used for research and development cycle shown in figure 5:

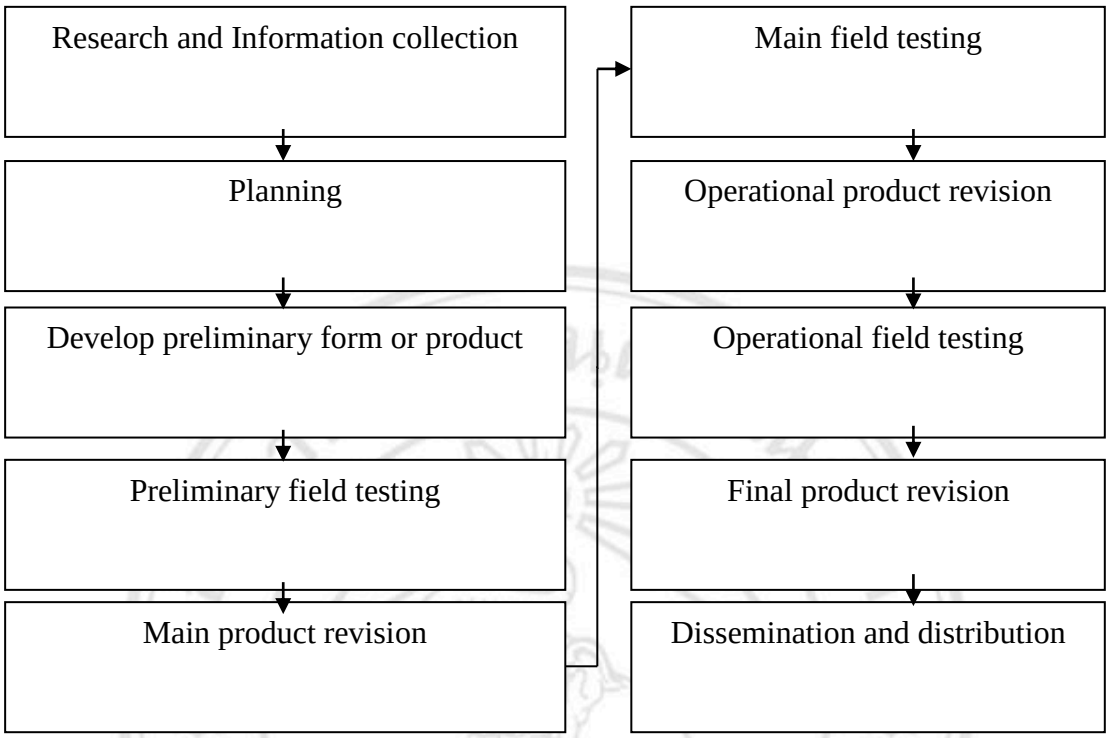

Figure 5 Steps to a range of research and development (The R & D Cycle).

Guidelines for Research and Development.

1) Choose products / formats.

Before doing academic research, R & D is required to describe the main characteristics of the product / model should cover the 3 main issues: 1) An overview of the goals, creating a form 2) Have a rough idea of the utilization patterns, and 3) A statement of the purpose of the specific model. Objectives should specify the level of performance that can develop learning and teaching, in accordance with the time.

Criteria in selecting products / formats in bringing development in the Far West Laboratory is taking into account these elements.

1.1) Goal of the model is an important educational needs or not.

1.2) Has conditions (factors) advanced or progressive enough. To make the development of models that are possible or not.

1.3) Has personnel with the skills, knowledge and experience required for model development or not.

1.4) Development model under reasonable period of time or not.

2) Study literature.

Literature and the findings of other researches, it is important to develop and planning the model in basic research and applied research. The goal in R & D will study literature for knowledge to be applied to the format that researcher want to develop. In addition, interviews and field observations are needed to be used in conjunction with a review of the literature serve as a basis for knowledge and discovery. The layout design is appropriate.

3) Planning.

Planning, product development / educational format using starts from defining a specific purpose. Or criteria to judge the performance of a typical clear. Educational format design should consist of a study that used philosophy and guidelines to gain the acceptance of the teacher and the students, so if the target is not clearly developed. Make the results of the measurements are not clear and to the point as well. Therefore can not confirm the performance of the model we have developed.

A key element of the planning consists in planning the use of resources. Such as how to budget how many people will work throughout the project. And the work carried out in developing the model in each step. Carefully planned to make use of resources is worth the cost. Including planning support from external sources before the implementation of the model. Coordinate space to bring style to trial. Accordance with the timing and process the form.

4) Initial field testing and improving the model.

The primary goal of the field test to evaluate the quality of products / formats when applied to the preliminary test by product / model to use with teachers in small groups with 4-8 people is enough for testing at this level. The evaluation will focus on assessing the content and methodology of the model rather than to assess the production of the format. So select the test to be a similar and consistent with actual space to bring style to use. And when it was found that there is a difference of assessment results in different areas. To bring products / formats. Add in other areas to try to find a clear conclusion.

5) Field testing and improve products / formats.

The goal of the testing process R & D is key to deciding which products / forms of education. Under development results were found to be effective. In this procedure, using the design of experimental research to determine the effectiveness of the production of the format. Therefore, the goal of the field test first principle. It is possible to test the success of a model based on objectives. And the second is to collect data that will be used to develop a model to complete the next level. Thus, the data from the questionnaires and interviews should cover all the main test.

The main field test will find important information on the imperfections of formats which are necessary in the adoption model updates and will be put to the test in a more complete form. This circuit will be tested and improved continuously. Unless there is a defect of form, at least for the purposes of assessment forms are defined. In developing the model may be possible that the format has been developed in the second field-tested core.

6) Tests in real space and last updated model.

The goal of the tests in the actually area. To determine the educational model developed is fully ready to be put to practical use which means the model can be used in schools without the participation of faculty development model or helper. In this phase, all forms must be complete and thoroughly tested and has been recognized as well.

After completing the tests in the real space. And data analysis to contribute to improving the final model. Form has improved as a whole, including the media guide. And expanding the use of the model to the wider society. This model were sold and leased for other schools to apply to and during the implementation of the model are also monitored to collect data by questionnaire and interview format. The data model for continuous improvement. Until the development of assessment tools, the efficiency of the model. And discover new ways to solve problems of the form. This last step is very important and it is necessary to control the quality of process models. And leads to referrals and forms prevalent in the future.

9. Related research

Education related research, researcher classify related research into 3 categories: Research related to the development of computer programs, research related to the development of information systems, and research and development in education as follows :

9.1) Research related to the development of computer programs.

Research related to the development of computer programs to facilitate researchers in the field of statistics and research are as follows.

Nirun Tungteerabunditkul (B.E. 2536) has created a program for a microcomputer for analysis of quantitative data in educational research. Using Pascal language version 5.50, program is divided into five parts: First it was the program menu, second program management, third program to help calculate the statistics and print reports, forth the programs to help facilitate and the last was other management program. Then programs were compiled into a single program named stat.exe. Statistics and ability of the program were, to build a table distribution, frequency and percentage, measurement data, measure of central tendency, measure the distribution of standardized, scores normalized, correlation, coefficients and testing the correlation coefficient, estimating average and proportional, analysis of variance, a multiple comparison, the average and the significance of the statistics from the calculation. In addition, the program can print the results of the analysis of the data in the format used in the study. Effective monitoring of the program created was divided into 4 areas at the precision. The suitability of the results of the data analysis, and ease of use, found that all aspects were effective and appropriate. It is found that the description in the manual corrected as the program works. The averages were between 4.10 to 4.62 , which were in very good level. The results from users found that application can run the program correctly every step.

Taweesin kulnapadl (B.E. 2538) had developed a computer program to determine the sample size and statistical power for testing the difference of the arithmetic mean. The application to determine the sample size and statistical power. Test for two independent groups t-test 1 group 2 group. Test and F-test 3 groups to 10 groups of programs developed by a command of language FoxPro version 2.5.

Teerawat suteesan (B.E. 2542) had developed a computer program to select and use appropriate statistical techniques to determine the sample size for social-science research. The program was divided into two sub-programs : 1) the selection of appropriate statistical techniques in choosing appropriate statistical data analysis. Data analysis by classifying the target or the main question of the research to describe a population or sample. Correlated or predictive test for differences between populations. Systems or structural relationship among variables. And seek a causal relationship, 2) the sample size in the case of descriptive research or survey. And the case of experimental research which the program developed by using Visual Basic 5.0 language.

Patcharin saehair (BE.2544) had developed a computer program for meta-analysis based on the concept of the glass. Using Macromedia Dreamweaver 4.0 and a series of command of the language, Visual Basic 6.0 application performance evaluation by the research and evaluation program. With experience or basic knowledge of the meta-analysis . Findings made computer program two parts: 1) guide the meta-analysis will explain about the concept of research synthesis. and 2) the meta- analysis. A program that can receive data based model to calculate the benchmark index benchmark, index estimation model 16 with a calculation of the six test forms and data entry features research without restriction. Evaluate the effectiveness of the program by the authors find that the program was effective in the accuracy. Reliability System malfunction and speed of the program found that the assessor. Modernization program has Simple and easy to use and beneficial to the research by meta-analysis.

The development of computer is to use a computer language programming to operate as desired objective. The process of developing a computer program to analyze the problem consists of designing, writing and testing programs. And adoption normal development, it is the satisfaction of the user program. Findings is most make a program to solve a specific task . The analysis and design of both the import , processing and report formats. The satisfaction of the user program. Type of computer software developed by the two types of control hardware. And application- specific task. Feedback on its use. Stage application developed to replace the old system made by

hand. Applications and guidelines recommendation of the study. Approaches to improve program efficiency than ever before.

9.2) Research related to the development of information systems.

Synthesis of research information system development over the period B.E.2542-2552 of 67 subjects, found that the development of information systems related to data storage. Information processing and production information developing information systems currently used in the preparation of computer databases and computer programs developed to help produce information on demand. The satisfaction of the user. Findings is most developed system in the storage subsystem. And data processing to provide the information as needed. Evaluation of user satisfaction of information system. Storage contains two forms of the indexed document collection into categories. And using computer databases have designed data structures and data types used for storage. And the relationship between feedback on its use. Most computers use a central database to collect data from all units. The connection between the computer causes the internal network (Intranet) and the Internet is suggested to further study should develop a central database in XML format. Client / Server to work in a networked computer.

The development of information systems for quality assurance lassified into 2 types.

1) Research development of information systems by using a computer program. Including research on the development of information systems for quality assurance. The Faculty of Engineering of the University case study (Nutcha hunpanit, B.E.2549), the development of information systems for quality assurance database using MySQL and PHP language. The development of information systems for quality assurance and process standards education basic education (Phat Chit happy embracing , 2546) is the development of information systems for quality assurance. Specific processes by using Visual Basic and Access database research . The development of information systems for quality assurance standards for the basic education level (Pattanajit sukpiboon, B.E.2546) was the development of information systems for quality assurance. Specific inputs by using Visual Basic and Access database. And research The development of information systems for quality assurance in education area (Thitinun piwkriang,

B.E.2549) were developed quality indicators. Using the standard of education website development concluded on district level.

2) The research on system development, including participatory research. The development of information systems for quality assurance such as Kaminrat school in muang district Kalasin province (Veerasak Chaypad, B.E.2550) were developed information system for insurance using the research process. Emphasis on planning, observation and participation was reflected back(PAOR) research. The development of information systems for quality assurance education learners. Nursery school Bantumtim Chaiyapoom province (Sathaporn meepaeng, B.E. 2550) developed information system for insurance using the research and development of information systems, particularly the students. Research The development of information systems for quality assurance study. Chaiyaphum Educational Service Area 1 Office (Ubon tolit, B.E.2547) was the development of information systems for quality assurance by forming strategic development consisted of training and study supervision research. The development of information systems for quality assurance Buaba wittayakom Peepatom district Maha Sarakham province (Jirasak praneenit, B.E.2546) was the development of information systems for quality assurance by conducting follow the 4 steps: planning, monitoring and evaluation research. The development of information systems for quality assurance education at Ban Nongi Kanthalak district Sisaket province (Chatee pimchai, B.E.2550) was the development of information systems for quality assurance by action research. Information systems development process consists of five phases: systems analysis, system design, system deployment. And checking the accuracy of the system. Research The development of information systems for quality assurance at Ban Puay office of education area 1(Niratchakorn thongnoi, B.E.2550) was the development of information systems for quality assurance by using information systems development process 2 cycles and then evaluate the results of operations.

Nipon Tasawong (B.E.2541) conducted research and problems using information systems for the management of administrators. Found that managers and workers were knowledgeable about the system manually. Academic Information Systems Management was used the most. Most do not have a link to an external computer network. Classification format collection and development of computer

programs to analyze the data. Presentation of data and information are also using the computer as a minority. Another problem is the shortage personnel with knowledge. Equipment Outdated and inadequate each school has different guidelines for management information systems as standard.

Ploenpit yadpaka (B.E.2 5 4 9) had researched the subject. Management information system of education in Bangkok area 1 educational office found in most problems schools were collecting the data was not accurate and current. Shortage of personnel who had the knowledge to work with the information technology. Found that personnel in schools was still considered the information accompanying workload . So do not focus on information technology as they should. And utilization of information was poor.

Summary information systems are important to the management and operation of educational institutions, especially academic work which is at the heart of education, parents and other agencies interested and want to know the correct information, so a reliable internal information system education is essential because it will need a complete and current data system.

9.3) Research related to research and development in education.

Researches related to research and development in education were as follows:

Somjit sawatanapiboon and the constitution (B.E.2548) conducted a study. Research and develop a sustainable science instruction. The objective was to research and develop a series of learning science through development model and study the performance of scientific research and sustainable development of the Learning Sciences. Conducts research and development had four steps. Step 1 The basic data for planning, building sets, learning sustainability step 2 to create a learning sustainable development model of performance scientific 7 series step 3 trial series, sustainable learning science in high school step 4 to report the development of a sustainable learning science. By evaluating the zip format (CIPP Model) in four areas: 1) the context, 2) the fundamental factors, 3) the process, 4) the products. Conclusion were as follows: 1) Set of learning science, sustainable performance were higher than the

standard 2) Results showed that sustainable management science performance of students in science learning and teaching science with the sustainability criteria set higher than 65 percent , significant at .05 level scientific performance of the experimental group 1,2 and 3 to learn a set of learning science, sustainable difference significant at the .05 level. Capacity to make projects sustainable environmental science students' learning with the learning of science sustainability. Difference was not statistically significant. 3)There were developed a complete science learning sustainable patterns of Zipper (CIPP Model).

Somjit sawatanapiboon, Laeld rakpao, Sompatana wongboonnuek and Arepaporn singharaj (B.E.2 5 5 0) study the measurement and evaluation of teaching science as the actual conditions in level 4, aims : 1) to develop a model to measure and evaluate teaching as the actual conditions, 2) create a module to evaluate as the actual conditions, and 3) to display the results of the model evaluation in teaching Science as the actual conditions.

The results were as follows: 1. Patterns, measurement and evaluation of teaching science based on actual conditions were 1) to define the purpose / goals, 2) define workload 3) defining evaluation criteria workload 4) designing learning coupled with measurement and evaluation as a the actual conditions 5) learning management coupled with the measurement and evaluation of the actual state 6) to evaluate the performance of the workload according to actual conditions 7) project preparation , development and measurement. Evaluation of learning science as the actual conditions , and 8) a summary and extension projects. 2. Results establish the actual evaluation module efficiency 81.47/81.25 higher than the 75/75 3. Results of the measurement model. And evaluation of teaching science as the actual conditions module evaluation found that science teachers in high school with average ability to measure and evaluate authentic learning science by 77.96 percent higher than the 75 percent statistical significance level of .05 and satisfaction to measure and evaluate learning was good level.

Office of the Education Council (B.E.2 5 5 2) had studied the subject of Research and innovation enhancement of educational organizations with knowledge management. The objectives were : 1) to study the knowledge management of the

Office of Educational Service Area 2) to study the knowledge management of basic education, 3) to study the dissemination of knowledge to the office of basic education area 4) to propose policies and strategies to promote the area offices of basic education, the use of knowledge management to enhance organizational performance. Research process consists of the development of knowledge management. Putting knowledge into practice in the organization, supervision , monitoring and evaluation of the research. Educational organization was excellent practice in knowledge management. Spread the knowledge to other organizations. And the final step was to present the office of policy and strategy promotes education and basic education in knowledge management to enhance organizational performance.

The results were summarized as follows: 1. Effects 1.1 Quantitative model of knowledge management at both the office area, and basic education office consisted of 95 models. 1.2 Target corporate form was a form of knowledge management into practice on the part of the area education office and basic education office 1.3 Knowledge management of 600 people who can bring knowledge management to integrate the methods driven enterprise development strategies to diverse 1.4 Media spread knowledge and expand their knowledge. The media articles and monographs and books on 7 summarizes knowledge of the organization. Media and information technology in VCD format Blog and website knowledge is knowledge of 147 blocks. 2 qualitative targets enterprise 2.1 Access to knowledge of an individual or group of individuals. 2.2 External organizations to effectively impart knowledge to the students, giving students a problem to get help. Achievement was higher. And the effect on teacher quality. All groups, the media , information technology for teaching and learning. Exchange of teachers and students to learn together. The consequences were shared between the school and community. Sporting activities common environmental development local knowledge and help students learning 2.3 the spread of knowledge and processes 2.4 Success factors and conditions that include leadership, the importance of knowledge management. Ready to work as a team, communication and information technology to be used in exchange, collaborative learning 2.5 Problems in knowledge management. Administrators lacked of knowledge and understanding of the principles

of knowledge management. Making it impossible to use the method or process of knowledge management in process as usual.

Office of the Education Council (B.E.2553) had studied the subject. Research and development, policy development and teacher education. Action research methodology, research and development as the base for development was divided into three phases: 1) to identify issues propose policy development and teacher education, 2) the development of alternative policy proposals to develop teachers and educational personnel, and 3) development of policy proposals to develop teachers and educational personnel. Data were collected by a discussion of the sample was obtained by multi-stage random. Overall , participants in the focus group were 314 people and critically evaluate policy proposals by experts. And education were 70 and were analyzed by content analysis approach program Atlas.ti classification information into the system. Consistency and linkages presentation and analysis of data in a visual manner aimed at answering questions including the purposes of research. And offer policy development for teachers and educational personnel evaluated and updated.

The findings were as follows: 1. Results identify issues and propose policy development for teachers, staffs, consisting of 1.1 problems and solutions that contribute to improving the quality of the learning period. Most teachers did not graduate with majors in group teaching workload, lack of knowledge and understanding of curriculum and teaching. The assessment was not appropriate. Lack of supervision teacher development, lack of morale in the workplace. Learners lack the necessary skills to learn. Lack of education, manpower supervision with the expertise to handle specific problems 1.2 teaching basic education concluded that the students found that the students had developed more academic. However, due to social and environmental problems. As a result, student achievement remains low. Lack of desirable features ,lack of critical thinking, problem solving and creativity. Teachers and educational personnel that were affected by changes in the structure and management system makes it a mission to increase. A crisis shortage of teachers at all levels. All groups learned It was a result of the control measures were part of the government. And can motivate people with knowledge. The ability to teach the teaching that changing the curriculum. A core

curriculum for basic education B.E.2551 with the integration of sufficient economy philosophy.

Teaching problems found some teachers can not adapt and develop self-management teaching materials that keep pace with the changing needs of society. The promotion and support of the operational issues associated with the decentralized administration. Involvement of private and family. Lack of information technology use in teaching because teachers and lack of talent and had not been developed to make use of information technology. Schools lack the agility to be managed effectively. Local governments and related organizations. The involvement and support of education has done little 1.3 The problems of teacher development and educational experience that teachers have developed quite a lot. But the lack of monitoring and evaluation. Curriculum development, redundant teachers development costs were relatively high. Should prepare teachers and personnel information systems in a systematic and ongoing. Research and development, policy development and teacher education. The rules and procedures for the accreditation. And promoted on the basis of academic and behavioral processes. Eyewitness documents used in the performance of duties and work practices 1.4 The synthesis issues for developing policy proposals development for teachers and educational personnel found that seven themes: 1) lack of systems and mechanisms to improve the quality of management. teaching, 2) lack of management conducive to the performance of teachers and educational personnel , 3) lack of support for teaching that contribute to learners' quality 4) lack of systems to promote the advancement of the profession, teachers and staff. education, 5) lack of morale in the workplace 6) lack of support for teaching and learning that conducive to the performance of teachers and education personnel and 7) lack of mechanisms and good management.

2. Effect the development of alternative policy proposals development for teachers and educational personnel consisted results of policy proposals . Critical evaluation by experts, the cover consideration of the appropriate consistency, clarity was helpful and the possibility in the policy proposals into practice. And improving policy proposals No. 1 concluded that the draft policy proposals still have 4 issues like : 1) systems and mechanisms in the development of teachers and educational personnel

provide quality affect the quality of the students. effectively, 2) develop a management system to effectively contributing to the performance of teachers and educational personnel 3) organization to promote and support the teaching and learning that conducive to the performance of teachers and educational personnel. and 4) a system for enhancing the morale and career advancement of teachers and educational personnel.

3. Proposal development policy development for teachers and educational personnel consisted results of critical proposals oriented policies. Development of teachers and educational personnel on second time by educational personnel related to the promotion and development of teachers and educational personnel concluded that policy proposals are 4 issues as before. And were classified as urgent . Long-term measures

Jona Dunlap (Dunlap, J.C.,2005) conducted a research and development study. The curriculum, developed the professional expertise in educational technology. Using a problem-based learning (PBL), self-learning and performance. they were studied by the software engineering course in the University, together with the instructor to design the most appropriate course. Spend 16 weeks from the basic course in software engineering courses. The trial was jointly analyzed to decide whether any courses that make the project successful, and students need to know and can do what was expected and required in employment. After considering a learning experience, students will be graded on the right course and content experience spans these skills were assessed during the operation. Presented a table showing the four phases of the model using problem-based (PBL) curriculum and activities that were used to teach in each term.

Students pointed out the problems in a given project (RFP: Request for Proposal) from companies that manage teaching through applications developed on the site include: (1) to answer questions on the project, (2) a detailed analysis of software 's (3) developed and designed a program to solve the problem (4) the adoption and application testing solutions. Introduction of courses in a given project (PBL) had 3 times the content was focused on teaching strategies. Authentic activities participation and reflection in Phase 2 were sometimes called the solution design activities first explain the basics of planning practice. Students to learn on their own to gather

information that will help answer the needs of a given project in Phase 3 development for an answer. Last activity explains when the group was believed to have enough knowledge to write the answer in the given project and submit it to the team. As the focus on the actual activities and the involvement of people in the group. Angle of reflection in projects associated with the news that the learning experience of students.

Evaluation of Dunlap in the experiments in the field of research and development. Cause learning context in place and the program was taught. But the question was still up on that. Students could use the new skill called context actions. (Events that require practical skills as possible), the reliability of assessments during the course of action to test whether appropriate or not. By highlighting the use of problem-based. Recognize and prepare students to work as a software engineer software. The focus response close to the action context. Evaluation, including analysis of data from students. The Guidance establish priorities between fourth and subsequent implementation phases of the problem was the base. Matriculated students before and after the test. Build confidence and make their own decisions about the organization and conduct applied. Software engineering courses had to put in a performance.

Students information shown the confidence of students turning 2 strongly depended on the ability of developing software and changed the attributes of a professional student. Information copied from elsewhere shows that the start of the course Students of 29 to 31 people will be impressed, whether preparing for a software developer in the real world or not. While working in the company who created the project, 30 students had started to change the impression of self-confidence was based on the development of software, such as learning too much in the last 3 weeks. This seems to be the real world rather than in the classroom. At the end of the course students indicated that of the 2 7 people. Courses prepare students to be software developers, such as if they are hiring now. Students will be able to work it and be ready. Students were 22 people reported that students saw the benefits of using them. Training as a real solution to effectively observed that all students received a grade of B or higher based assessments were involved. The student was successful based on practicality students also correlated with self-perceived correctly. In response to a questionnaire, 10 questions to measure using queries about the 4 levels of 1 (low) to 4 (high) in each , so

the ratings were changed between 10 (10 questions each of 1) to 40 (10 questions , each 4) average before the experiment was . 22.07 (SD = 4.55, N = 31) and average posttest was 37.90 (SD = 2.54, N = 31) , increased significantly (t = 27.88 df = 30, p <.0001) pressure lab concluded that activities based on actual conditions. Participation and reflection learning experience with authentic problem solving (PBL) helped students accessed to perceptual learning. And more practice to make it work so successfully design future course allowed students to engage in authentic problem-solving activities.

Summary of the research and development generally includes the steps at least 7 steps : Step 1) Study of problems and development needs. Step 2) Study related research and define the purpose of developing. Step 3) Development. Step 4) Test the developed system. Step 5) Update the system up . And evaluation during development (Formative Evaluation). Step 6) Repeat steps 4 and 5 until the system. The development of quality (Estimates are acceptable). Step 7) Extends the results of the evaluation system and the subsequent adoption (Summative Evaluation).

9.4) Research related to model development, evaluation and synthesis of knowledge in educational research.

Petcharin songprasert and team study the research on the development of a form of administration. The principles of academic teamwork in Basic Education (Journal of Education. Narasuan University, B.E.2551) which was intended to develop a model based on the principle of academic administration. A team in basic education . And conduct research with 4 steps: 1) education component. Patterns of academic management principles of teamwork related research papers. And from interviews with school administrators and teachers, academic experts amount 15 persons. 2) Creating model academic management principles teamwork in basic education.
By checking the suitability and feasibility by 5 experts and teachers , academic administrators amount 22 persons. 3) The trial forms the basis of academic administration work as a team. Basic education with the number of criteria 1 place and 4) Evaluation experimental model using the principles of academic administration work as a team in basic education. By considering the opinions of administrators and teachers in the schools who use a number of 15 people found the findings.

1. Academic administration to the principles of teamwork format. The analysis of the documents related research and interviews with teachers, school administrators and academic experts. There were four components of 1) Consists of instructional leadership behaviors of leaders. The organization for teaching, planning organization for teaching Curriculum development and management of teaching and learning. The Project Development Measurement and Evaluation of Teaching 2) The process of teamwork in education includes the recognition and search problems. Gathering and analysis Putting the plan into action a plan to evaluate the results 3) Academic mission and scope includes curriculum development. Developed to measure the learning process. Assessment and transfer of learning. Research to improve the quality of education. Developing innovative media and technology education developing learning resources educational supervision create a new blog. The development of quality assurance in education. Promoting the scholarly community. 4) Academic administration consists of planned implementation plan into practice. Monitoring academic assessments, improving academic.

2. Academic administration the principles of teamwork in basic education format. that was created consists of 4 main elements : 1) the composition and leadership, learning and teaching 2) elements on the process of teamwork 3) components of academic mission and scope 4) component process model of academic administration. Academic administration teamwork principles in basic education were developed. Details appear in the manual operation which assessment was more appropriate.

3. Experiments using a form of academic management principles of teamwork in basic education. Results executives / chief academic behavior and practices consistent with the role of academic leaders. Context of education and Personnel and those involved were knowledgeable about the principles and process of teamwork can practice the steps concretely.

4. The assessment model academic management principles of teamwork in schools. After the trial confirmed the basic model academic management principles of teamwork that developed four elements. It was possible and appropriate level.

Aiyada kaysomrid (B.E.2551) studied evaluation systems development in school. Case Study Aiyikaram temple school under the Pathum Thani Educational Service Area 2 Office intended to develop system evaluation in 4 steps: Step 1 The basics evaluation educational level of education. Documents and interviews with experts to measure and evaluate system design step 2 The basic concept of the system of quality control step 3 Trial evaluating system studies. And Step 4 to evaluate and improve system performance evaluation level education.

Results of evaluation development systems consisted of 3 subsystems including monitoring progress in learning, system transfer of learning and evaluation system to judge the results. The proposed system consisted of five items: a chart of the standard methods. Indicators of success The success and quality criteria or standards. Development operating system appeared. Monitoring progress in learning. Affect the two processes do not quality as an indicator of success. However, the development commission performance had improved the quality criteria before. Researcher performed the procedure in the next step, had improved the educational level evaluation map operation in monitoring progress in learning to be clear on the action. The duration of the training activities in capacity building to create a learning assessment tool. Improved documentation and training to be effective. Evaluation of the developed system was effective and could lead to the development of this system.

Thai Kasikorn Research Center (Online on 4 Jul 2555, From http://www.thai-aec.com/) studied the knowledge economy of ASEAN (Asean Economic Community: AEC), and presented the analysis approach development of Singapore as follows:

1. The focus of cognitive development to enhance the economic potential Although Singapore is unfavorable factors of production are higher than other countries in Asia but Singapore seeks to develop knowledge. Through research and development continuously to increase productivity a higher level and bring further innovation to the business. This helps build competitive advantage and enhance the competitiveness of Singapore. It also helps reduce dependence on foreign technology, such as the development of new types Biomedical up a major industry. Coupled with the major industry days will have competition from Asian countries intensified.

2. Non-stop to raise the living conditions of people in the country. Changes in the nature and characteristics of the population in Singapore, such as the expansion of urban society. Changes in population age and more diverse population. As a result, the private sector was still trying to find an opportunity to develop new products and services. Cause economic value and also help raise the living conditions of people in the country for the better.

3. Investment for R & D of Singapore has increased continuously. The main policy of Singapore to encourage investment in R & D by the business sector, and to attract investors. Environment that is conducive to doing business. Relies on technologies such as the location of the country. Infrastructure etc. The spending for research and development as a whole (Gross Expenditure on Research & Development: GERD) Singapore B.E.2553 was worth 6.5 billion Singapore dollars , up 7.4% (YOY) by more than 60 % of use. such expenses from the private sector while personnel increased by 4.3% (YOY) Singapore franchise sector.

4 . The Singapore government to give priority to the business sector are investing. For research and development in Singapore. This is an incentive for the private sector to engage in more investment constantly such as privileges . Policy to promote this cause the amount of activity to develop products and services in Singapore occurred in many areas of business . Especially in key areas such as the electronics industry. Chemical products , etc. We have established joint ventures with the private sector from other countries in Asia such as the Jurong Aromatics Corporation , etc.

5. Planning in economic development on the basis of cognitive development in the long run. In short hereafter Singapore aims to make the country into a center of research and innovation for business by the year 2558 will have a higher portion of the costs to R & D provides up to 3.5 percent , also under way to develop the economy of Economic Development. Board to make Singapore a Home for Innovation , and the importance of cooperation in the development of knowledge from multiple departments (CO-Creationg Solutions) , both public and private.

Witthakorn Chiengkul and team (B.E.2553) studied the synthesis of the findings of educational reform Of Finland, New Zealand, South Korea, USA, UK, China, Vietnam and Thailand. Summary of achievements in education reform in each country as follows.

Finland and New Zealand A country that can deal with relatively equal quality education throughout the country. In particular, Finland Management and better education of the two countries has contributed to socio-economic development of the country to prosper. People's quality of life called a development that is both effective transparency, fairness and sustainability. Finland is not only the most talented high school kids learn what the whole country. In the OECD 's PISA international test they are less stressed. Discipline and respect for teachers than students with other countries with a problem that many students do not learn good habits and behavior issues and more not only happen in Thailand. In the U.S. England is a very big problem as well. Finland has a very progressive concept in the evaluation of education in the basic education level assessment development of each child. No exam standards match the room or floor level. Except at the high school to serve as a passport to apply for university or work out. However, teachers must have the knowledge to evaluate and assess children with serious attention to what Finland is doing very well and is on track to help children with mild learning problems slow learners carefully from the beginning to help them learn by friends immediately.

U.S. and UK , with some institutions and some of the countries with the development of high quality education is pioneering research and development in various fields of knowledge. The Science Technology and Management However, an overview of the country, the study also differs in each locality. In each group, the more Overall education of the United States and Britain also have various weaknesses are more moderate on the exam, such as the race to develop an elite minority and the specific skills adapted to the industrial capitalist economic system with a distribution of property income to the various groups. Very different U.S. study England did not develop the whole country in a holistic way that it should. Politicians, administrators, teachers and students in the U.S. and the UK each have their own problems, despite two countries will have to budget for higher education reform program, but had little effect

in the latter approach to the reform of education in the United States. And the UK are expected to have the greatest effect. Is a state- funded schools, which the Foundation Charter or Independent School parent groups are managed by the people themselves to rise. This is because schools do better than public schools and keep tuition lower than private schools .

South Korea is a developed country with political and popular culture and feudal militarism and economic development, is a army of industrial capitalism is dependent on investment and trade with foreign countries like Thailand. The studies have focused on memorization to tutorial university entrance examination is very similar to Thailand. Korea on 40-50 years ago, was a social as well as economic development. Or lower than Thailand but today, South Korea, where people are thinking patriotic than Thailand. Economic, social development and education go beyond Thailand in spite of a country with a population less than Thailand . South Korea is a member of the developed industrial countries in the OECD and the G20 group of 20 countries with the biggest economies of the world.

China, Vietnam is still a developing country population, education and economic development are different, but the two countries dedicated to improving education more seriously. And the economy is growing rapidly The government's policy to develop a group of children with serious talent. And focusing on research and science, technology and management. Creating the environment for the children and people love learning to read with good attention to the nation 's strengths and lessons to teachers in Thailand, Vietnam and China Salary not high. Teaching the class is small, but the students excel in the two countries was important subjects such as math and science students and two teachers in this country to that country. The most diligent learning more. The love of learning intentions attention of students and teachers is an important factor in the learning process by the government, such as Thailand and the other focusing on solutions to the budget is the main aspect is not always the way to increase the quality of instruction.

Summary of the research and development, there are a variety of ways, some form of action research is the development of innovation. Or new methods such as the development model (Model), or some of the research is to develop or create new inventions, such as the development of information systems and information technology. But mainly developed to study the knowledge that has come before. May be used to synthesize the research is to develop trial and evaluate the process several times. At the end of the study must be evaluated and published to prove that innovation or invention into a high quality and can be used in general.

10. The research conceptual framework