

The Research and Development of Teacher Production and Training System on Teaching Biology through Contemplative Education Coaching & Mentoring System and Research-based Learning

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Abstract— The purpose of this research was to study the results of learning management in Biology teaching method 2 by integrating the concept of contemplative education, coaching and mentoring system and research-based learning. The subjects were 38 fourth year Biology Education program students who were enrolled the course methods of teaching in Biology 2 in the first semester of academic year 2016. Research tools were (1) the quality assessment of the lesson plan (2) questionnaires of students' opinions on learning management (3) students' learning behavior reflection (4) learning log and (5) teaching log. Data was analysed using frequency, percentage, mean, standard deviation and content analysis. The research found that the development of teacher production and training system on teaching biology through contemplative education, coaching & mentoring system and research-based learning had a result in the development of teaching and learning and help promote an effective teacher. Moreover, students were happy to study Biology teaching methods course and there were no major problems or obstacles that affected the learning management process integrating the concept of contemplative education, coaching and mentoring system and research-based learning.

Keywords- *Pre-Service Teacher Production; Teaching Biology; Contemplative Education; Coaching & Mentoring System; Research-Based Learning*

I. INTRODUCTION

One of the key missions of all Rajabhat Universities is the production and development of teachers, which was established in the Rajabhat University Act of 2004, in chapter 1 and section 7. Therefore, at the meeting of the president of Rajabhat University, the meeting recognized the issue and saw the importance of it, and the memorandum of cooperation on the development of research systems to excellence for the development of local community societies between the research fund office and 40 Rajabhat University, on May 19, 2015. To support the development of research systems to develop excellence, with one objective in accordance with this memorandum, is to create research to develop society, communities, and local areas in an issue. For example, education reform for localities, local science, led to the creation of local occupations, which the president's council approved by the council of deans of faculty of education/education/college of teacher training. Rajabhat University created a system research and development project and developed teachers using a research base project based on the results of teacher coaching research projects and intelligence

breeding research projects, and then linked to the production and development process of teachers of the faculty of education in Rajabhat University, with the main concepts used to conduct the research as follows:

Phase 1: Enhancing understanding of concepts used to develop teacher production and development systems, implementing the development of relevant target groups consisting of: Teachers, teacher students, in-service teachers, and teacher students who are in year 4. Using mental education concepts and activities, concepts and learning activities with research base projects (RBL), based on research projects for breeding intelligence, coaching ideas from teacher coaching research.

Phase 2: System development and production process and teacher development in the faculty of education/college of teacher training, removal of knowledge and knowledge management (KM) to obtain a set of knowledge that can be used in the production process and teacher development, conducted by developing mentoring teachers of targeted teachers, and the targeted teachers who participated in phase one projects to apply their knowledge in real-world situations in schools that practice teacher professional experience and create a professional learning community (PLC), where teachers and lecturers conduct research to improve teaching and development of teacher graduates, as well as “coaches” for students who practice teacher experience. Trained professional experienced teachers use innovations developed with their own students, with mentors as “coaches” at teacher professional experience training schools.

During professional experience training, teachers are stripped of knowledge and knowledge management (KM) to obtain a set of knowledge that can be used in the production process and teacher development in the faculty of education, Rajabhat University, as well as applying a set of knowledge in real-world situations in schools that practice teacher professional experience for all stakeholders. Including, executives, in-service teachers, mentors, and professional experience students, at the same time, conduct research and development of teachers, students who are studying in year 4, and mentor of the next generation of students, to ensure continuity and sustainability in the faculty of education.

The faculty of education of Chiang Mai Rajabhat University is one of the institutions participating in the research project and has selected faculty members in various subjects to participate in the program, in order to develop it as a model teacher in the production of graduate education. Therefore, the researchers adopted the concept of teaching and learning in the manner of learning management that emphasizes the students to be truly involved, in the academic year 2018, there are 38 students enrolled in the faculty of education who are studying in year 4, who study biology in 38 subjects, divided into 5 men and 33 women. Overall, students who take this course are students who study science and mathematics at high school, so they have a good academic background. Students have a good attitude towards studying in their chosen field, as well as having relatively high expectations for their careers in selected fields, thus giving most students a strong will and enthusiasm for studying. In student orientation, when the first semester of the academic year 2018, the student orientation was made, the teacher gave the student a reflection on why they choose to study biology. According to reflections, most students who choose to study in this field are in short supply, teachers in biology subjects lack interesting teaching techniques, make students tired of not wanting to study, resulting in low achievements, thus giving students who choose to study in anticipation of changing the teaching process in the same way for the better. According to the student's preliminary information, teaching and learning that focuses on learning at heart, using learning processes that can create new thinking systems and learning skills while instilling ethical morality is a research process that allows learners to conduct their own searches for real answers, with instructors as “coaches” who inspire and create self-learning, as well as learn from co-thinking and discussion, as well as share knowledge from actions. This type of teaching process is likely to create a friendly bond between the instructor and the learner, which is also a strong preparation for students to go out and practice their teacher experience in the school in the next academic year.

Therefore, this research project has been created to encourage researchers to develop their own learning activities systematically, with knowledge, experience, and to develop other forms of research effectively.

II. RESEARCH OBJECTIVES

1. To develop a learning management plan (HEd.3) that integrates mental intelligence concepts, learning studies using research as a base and mentoring system.

2. To study the problems and obstacles of the learning management process that integrates mental intelligence studies concepts, learning using research as a base and mentoring system.

III. RESEARCH METHOD

1. Population group

The population used in this research was students from the Faculty of Education in Biology who were in year 4 in semester 1, academic year 2018, Faculty of Education in Chiang Mai Rajabhat University, and enrolled in biology methodology 2, one group including 38 students.

2. Research tools

2.1 CCR learning management model and course details (HEd.3), CCR learning management model created from workshops under system research and development projects and production processes and teacher development by integrating mental intelligence education concepts. Including the nanny system and research as the base of the Northern Rajabhat University, where professors in each of the 8 northern Rajabhat disciplines have combined to design a knowledge management model of a group of science instructors, and there are five teaching stages: identifying questions, seeking information, creating knowledge, communicating stages, and giving back to society, and presented the characteristics of the CCR integration model at the meeting to receive feedback and apply. The researchers then applied the learning management model in accordance with the content and process of teaching science to obtain the model of the researchers themselves, and adopted the CCR learning management model to design a learning management plan in the form of a detailed course on how to teach biology 2 in semester 1/2018, and five participating researchers will consider content conformity and activities that integrate the CCR concept.

2.2 Two quantitative data collection assessments are (1) a detailed assessment of the subject (HEd.3), with five professors who are researchers in the project, as well as the instructor to evaluate the details of the subject (HEd.3), and (2) reflections on students' opinions on learning management after completing the learning management process. Both assessments were created by the academic committee for research and development of systems and production processes and teacher development, integrating the concept of mental intelligence studies, mentoring systems and research into the base of the Northern Rajabhat University, which has adopted the assessment form to the meeting and improved to the assessment for project researchers.

2.3 Qualitative data collection tools include (1) learning logs, which are used to store information during class in which students must record what they have learned, reflect their thoughts, reflect their feelings after each class, and (2) teaching log: researchers collect student data by observing and then taking notes that separate the issue of data collection by emphasizing the CCR concept that improves the desirable teacher graduate attributes.

3. Data collection

This mixed method of research collects both quantitative and qualitative data by collecting data in semester 1, academic year 2018, which is divided into 3 phases as follows:

Phase 1: Creating and developing a CCR learning management model

1. Study the concepts and theories of learning teaching using research as a base for mental intelligence processes, including mentoring and learning systems using research as a base, participating in research and

development projects and processes and developing teachers, integrating mental intelligence education concepts including mentoring and research systems into the base of the Northern Rajabhat University, and training with experts in such sciences.

2. Workshops with 8 Northern Rajabhat University professors by representative professors at each university will have meetings with the same disciplines to create a learning management model of each discipline, and the researchers are placed in the language teaching disciplines when they have formed the branch group and then presented the learning management model to the qualified persons and professors who attended the meeting to criticize the form and provide revised feedback to the learning management model.

3. Apply the CCR learning management model to the course detail design (HEd.3), by creating a framework for defining the subject content from the CCR learning management model before creating the course details (HEd.3), to manage learning in the subjects that the researcher is responsible for teaching in semester 1, 1 subject is biology method 2.

4. Adopt the assessment form for collecting quantitative data obtained from the learning network meetings of 8 Northern Rajabhat regions under the system research and development program and the production process and teacher development, by integrating mental intelligence education concepts including mentoring and research systems as a base, the academic committee of the project has designed an assessment to collect a total of two quantitative data. That is, (1) a detailed assessment of the HEd.3 course, and (2) reflecting students' opinions on the learning management of teachers, and the researchers have established tools to collect qualitative information, namely learning records and teaching records of instructors.

5. Bring the detailed assessment form (HEd.3) to the lecturers who are on the system research and development project and the production process and develop the teachers, by integrating the concept of mental intelligence studies including mentoring and research system as a base, the University of the Northern Rajabhat group of five people conducted an assessment based on the detailed considerations of the subjects taught by the researchers (HEd.3).

Phase 2: Implementing the CCR learning management model for trials

Take the learning management process according to the learning management plan (HEd.3) to experiment with 38 students, who are studying year 4 in biology, during each lesson, students must reflect through writing a learning record and the instructor will record the student's behavior through a learning management record, and upon completing each course they must reflect the student's opinion on the teacher's learning management.

Phase 3: Analysis and Summary

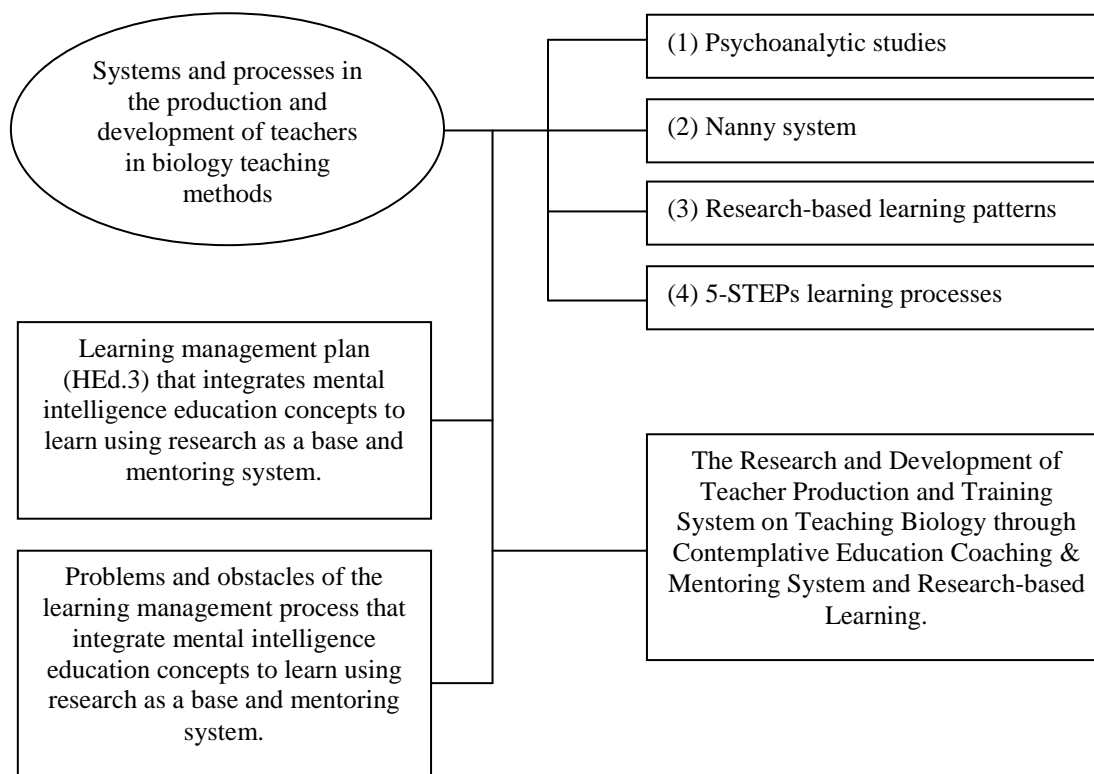
Analyzing the data collected using quantitative and qualitative data analysis methods to summarize and discuss the results.

4. Data Analysis

Quantitative data uses descriptive statistics, using frequency and percentage values, by analyzing data collected from 2 queries. That is (1) a detailed assessment of the HEd.3 course, and (2) reflections on students' opinions on teacher learning management. However, qualitative data is analyzed by means of content analysis, by classifying reflections into categories, and interpreting them with synthesis and analysis, as well as creating inductive conclusions.

IV. CONCEPTUAL FRAMEWORK

In this research, researchers presented relevant ideas and theories; it is illustrated as a conceptual framework chart, as follows: (1) psychoanalytic studies, (2) nanny system, (3) research-based learning patterns, and (4) 5-STEPs learning processes.



V. CONCEPTS AND THEORIESP

In this research, the researchers presented the idea and theories in the following order:

1. *Psychoanalytic Studies*

Psychoanalytic studies refer to learning their minds contemplatively, developing learning from the inside out, to raise awareness of the value of things, and to be able to connect knowledge in various sciences in everyday life. The main aims of the process of learning mental intelligence studies, as follows: (1) fundamental self-transformation is self-transformation by developing self-understanding of others and all things deeply and in line with reality, being affectionate, compassionate, humble and having a positive attitude towards themselves, and (2) consciousness of the common good, self-transformation based on access to the highest truths is truth, goodness, and beauty, and then leads to actions to change society and the world, by being able to act in a way that removes from things, has love, compassion, and understanding of fellow human beings.

The basic principle of organizing the process of learning psychoanalytic studies synthesized into “Psychopathic Principle 7”, also known in the English acronym 7 C's, (Thananil Chaikowit, 2008: 4-5)

1. Contemplation is to enter a mental state that is suitable for learning and then be able to use it to work contemplatively, both cognitively, interpersonal, and intrapersonal. This principle is at the heart of the mental learning process where process organizers must design processes that create conditions and encourage participants to have deep contemplation about themselves, relationships and experiences that are touched, based on a calm, relaxed, focused and aware mind.

2. Compassion is to create an atmosphere of love, compassion, trust, understanding and acceptance, as well as supporting each other on the basis of confidence in the potential of humanity, emphasizing the importance of trust, openness, feeling safe, compassionate sincerity (Empathy) and caring.

3. The principle of connectedness is to integrate learning in various aspects, to achieve holistic learning linked to life and all things in true nature.

4. Confronting reality is to provide opportunities for process participants to face two realities, including:

4.1 Self-realities such as thoughts, feelings of unconsciousness, avoiding or keeping pressing by promoting queries and touching their identities through deep activity and contemplation, without escaping under a safe, open, accepting and compassionate atmosphere, both to themselves and to each other.

4.2 Facing reality that differs from their framework, such as people with different backgrounds, community and social realities that encourage new aspects of learning, as well as conflicts caused by differences.

5. Continuity, continuity of the learning process, is important for learning for much change, because fundamental changes are often caused by accumulated experiences that help create internal conditions ready for fundamental change.

6. Commitment is the commitment to change itself as the most important element in bringing what is perceived into one's mind and taking the process back into life for continuous development and change within them.

7. The principle of community, community of learning is the feeling of being a common community that encourages learning and internal change of each person, as well as organizing processes that contribute to having time alone and spending time with others.

Therefore, it is considered that mental education is a process of learning of a person who focuses on learning from within, thinking and contemplating until understanding and realizing the importance of what is learned, understanding the spontaneity of things related to intelligence, making the mind truly developed, mental intelligence education is another interesting concept to integrate with teaching and learning.

2. Nanny System

The mentoring system here is discussed in two ways: coaching and mentoring.

Coaching guides/coaches may be school administrators, internal in-services or in-services who can guide them, teachable, and most coaches are instructors in schools, guided in-services focused on individual performance, and potential development of instructors. Coaching is a formal and informal communication between the guide and the guide, which is two-way communication, allowing them to jointly solve problems that arise in learning activities. For example, low learning achievement problems, mid-term learning achievement, media used to organize learning activities are not of quality, which together solves problems that contribute to a good relationship between the coache and coachee. However, to be a good coaching guide, there must be a guide and a guide. (Costa and Garmston, 2002)

Guidance guidelines, helping instructors require a diverse group of individuals, roles and activities, to lead them to their intended destinations, the dimensions of helping instructors develop at least 4 dimensions teaching arrangements, namely supervision, mentoring, training, and coaching, where the person in charge of development should use these roles at the right moment to achieve sustainable development, as follows: (1) In-service is carried out by experienced people to use processes, methods of assistance, directorship, supervision, supervision, so that instructors can develop knowledge and capabilities according to the organization's goals. (2) Mentoring is a way for experienced people to help those with less experience develop both professional and lifestyle development towards their goals. (3) Training is a method of cognitive performance with specific courses and procedures to meet the standards laid down. (4) Guidance is a way to improve the performance of instructors. It focuses on working towards the goals of the work, or helping to put existing and/or trained cognition into practice.

An important tool of guidance is the different language patterns that help instructors learn, the language patterns of these guides, and the examples that instructors can use to guide themselves later, using

different language for guidance of different qualities and levels. In situations where instructors experience difficulty teaching, many guides are more likely to provide solutions or provide guidance to instructors, instead of helping instructors figure out and find solutions on their own, they can help them figure out how to solve problems themselves. The guide must make a choice by asking himself. 3 questions, is (1) should we tell you how to solve the problem at all, (2) should we cooperate with instructors on solving problems by providing certain information and finding solutions together?, and (3) should we let instructors learn and solve problems on their own?

Mentoring provides knowledgeable or respected persons, or executives in counseling agencies and recommends helping younger generations or those at lower levels (Mentee) in matters that are beneficial to work in order to have higher potential. Mentoring may not be directly related to current duties, mentoring, in addition to applying to new employees; it is also applicable to employees who have worked in the organization before. The characteristics of those who are eligible for junior or lower levels (Mentee) in the organization should be as follows: (1) be a person with a history of successful work, (2) be intelligent and creative in work, (3) be a person who is attached to the organization and bound to the duties assigned to the job, (4) those who have ambitions and desires to work to achieve their goals, (5) be challenging and willing to work beyond their full-time job, (6) as a person who has a desire to gain progression and growth in the profession, (7) those who are willing to listen to advice and feedback from supervisors and those around them to improve and improve themselves.

Mentor is a group of people who are considered to be more prominent than other people, top performers that the organization must maintain, so mentors are the template of the younger generation or those who are lower levels (Mentee). In addition to being a template, mentors also have the role of being a coach by creating an understanding that matches the younger generation or those at a lower level (Mentee) in terms of corporate culture. Precautions or conflicts that may arise in the organization, the practice of avoiding or not facing upcoming conflicts (Political Preps), including analyzing the strengths and improvements of juniors or those at lower levels (Mentee), in order to find ways to further improve the capabilities and potential of younger generations or those at lower levels (Mentee). Mentor also has the role of advocate, encouraging and assisting younger generations or those in lower levels (Mentee) to grow or progress in their careers, by giving them the opportunity or stage to showcase their work, showcase their skills and ability to work.

The benefits of mentoring, that is, (1) creating talented and viable groups faster than regular employees, (2) incentivizing employees with good performance and high work potential to remain with the agency, (3) encourage employees to create more work, be ready to work harder and be more challenging, (4) create a more creative atmosphere of new presentations or out-of-the-box ideas, and (5) create a two-way communication system between mentor and junior or lower-level person (Mentee), supervisor as mentor, have time to come up with a policy plan and put in place a strategy to increase the efficiency of the team, as part of the task has been assigned to the younger generation or the lower level (Mentee) to take responsibility. In short, coaching is to teach subordinates in terms of job responsibilities, where the teacher is a standardized person, mentoring is a mentoring and guidance for new or existing employees whose performance is higher than the standard, in terms of work-related matters and so on, that will increase the potential of the employees, which will affect the development of the organization in the future. However, both coaching and mentoring are techniques for developing human resources that will allow both supervisors and subordinates to work to their full potential, and the organization is ready to accept change, effective performance in accordance with the goals set. Therefore, mentor is a highly experienced and specialized person, working with less experienced people, the relationship between the nanny and the collaborator will be positive, having an exchange of opinions, acting as a role model and respecting each other's opinions, in addition to being a template, the mentor must also play the role of instructor or mentor. However, mentoring and coaching aim to change the behavior of colleagues to be effective and effective.

The Thai education system has begun to implement project-based learning (PBL), which is learning by doing to enable students to learn outside the classroom, but often results in children “making work pieces” that provide certain skills such as group work and time management only, if research processes and scientific principles are applied to direct the project. In addition to integrating subjects into the project, the company also integrates the subjects into the project. Students can also develop analytical and synthetic thinking to critical thinking. The development of teaching and learning together for the development of students and teachers using the process of creating a coaching and mentoring system, with an emphasis on development to strengthen the spirit and ideology of teacher hood. Therefore, it concluded that research-based project learning management is applying research processes in learning, using critical thinking, synthesis, rational thinking, and changing opinions and information to gain new knowledge.

3. Research-based Learning

Wattana Rattanaprom (2017) has given the meaning of research-based project learning management, meaning teaching that creates a learning process for learners to create their own knowledge, which is based on researching information that learners are interested in learning to think, analyze, synthesize information as knowledge and be able to communicate knowledge to others through writing and verbal presentations and exhibitions from projects with research processes.

Most of our learning focuses on external knowledge, including in 8 subjects taught in schools, the learning process uses recognition, application, analysis, synthesis, and interpretation, based on practicing thinking, listening, speaking, and writing skills. It also makes our relationship with those around us flawed, such as likes and dislikes, quarrels and anger, etc. These deficiencies are all caused by internal learning that is mental, contemplative education, sometimes referred to as contemplative heart learning, as a study to develop internal aspects with religious and psychological sciences beyond belief. Psychoanalytic education is important for materialism learning today, especially with basic education at school, because it is the foundation of learning that leads to true knowledge inside and out. This will affect teachers and students directly immediately, as mental intelligence education is an important basis for research based learning (RBL).

The concept of research-based project learning is the management of learning with an inspiring “coach” instructor and a way to make learners self-learners, create self-learning and group learning in the manner of co-thinking, participating in discussions, sharing knowledge from self-action and learning groups through project work, as well as learning processes that are thought-based for a reason. Thinking, analyzing, synthesizing what is learned without ignoring real-life contexts can rationally link learning to real-life contexts. In addition, RBL's conceptual learning contributes to a friendly bond between teachers, learning managers, students, and communities, by building rapport based on the concept of mental intelligence studies, namely listening to each other, learn from each other without a system of power, but use “conversational aesthetics” to create academic learning while learning between the life of the learner and the real-life community/social context. As, Associate Professor Dr.Suthera Prasertsap (2012) gave the concept of research-based learning (RBL) projects based on the invention of the office of research fund that has proven that the research process is a learning process that can create new thinking systems and learning skills while instilling the morality of good researchers powerfully, focusing on creating research challenges from projects that allow students to find real answers.

4. 5-STEPs Learning Process

Developing a science teaching model, there are widely accepted teaching methods for teaching science, including the inquiry cycle teaching model (5Es), science teaching by the 7-step learning cycle model, and teaching using project activities. This, according to several research papers that conclude that teaching by these forms can clearly promote academic achievement, scientific process skills, attitudes and science, as well as thinking skills in various fields.

The 5-STEPs learning process, a new teaching style developed for valerian teaching, and taught using project activities, allows learners to develop basic and advanced thinking skills. As well as developing scientific process skills, this method is classified as a teaching that is fully responsive to the nature of science. The 5-STEPs learning process, which results in students having a durable understanding of process skills, has desirable attributes, and produces three skills focused on literacy, numeracy, and reasoning. In addition, the 5-STEPs learning process strengthens the key performance of the learner, including communication ability, thinking ability, problem solving capability, life skills capability, and technology capabilities. These performances will result in children moving towards a thinker, solving problems, creating pieces, creating new knowledge, becoming a virtuous schoolboy (Vorapoj Wongkijrungruang, 2011)

VI. SUMMARY OF FINDINGS

The researchers analyzed the data, as follows:

1. Analyzing student feedback on the results of learning management subjects, biology methodology 2, by integrating mental intelligence studies in learning using research as a base and mentoring system, using frequency and percentage values, by analyzing data collected from 2 questionnaires, that is (1) a detailed assessment of the HEd.3 course, and (2) reflections on students' opinions on teacher learning management.

2. Analyzing data reflecting student learning behaviors on the results of learning management of biology courses 2, by integrating mental intelligence studies in learning using research as a base and mentoring system of teachers, by classifying reflection issues into categories and interpreting, synthesizing, analyzing, and create inductive analysis.

However, the results of the data analysis, the researchers presented the results of the data analysis and translation, divided into 2 parts, as follows: Part 1: present information on the implementation of the joint learning management process between teachers and students, and Part 2: summary of teacher learning management. The results of “The Research and Development of Teacher Production and Training System on Teaching Biology through Contemplative Education Coaching & Mentoring System and Research-based Learning”, are summarized as follows:

1. System development and production process and teacher development of biology teaching methods by integrating mental intelligence education concepts, including mentoring and learning systems using research as a base, creating the development of teaching styles and helping to promote teacher ship effectively.

2. Students are happy to study biology and do not experience major problems or obstacles that affect the learning management process that integrates mental intelligence studies concepts, including mentoring and learning systems, using research as a base.

VII. DISCUSSION

1. System and production process development and teacher development of biology teaching methods by integrating mental intelligence education concepts, including mentoring and learning systems using research as a base, creating patterns in effective teaching and learning. Instructors can clearly and clearly identify the details in the learning management plan (HEd.3), as they are evaluated by a team of researchers and evaluated by students in all three phases. This allows instructors to apply recommendations based on the assessment of fellow researchers to improve teaching patterns, adjust HEd.3 before the start of the semester, and apply student feedback on teaching and learning after students have evaluated before class, during class and after class for the instructor. This is an all-round assessment that allows for real improvement, as participating assessments with a wide range of assessments, such as self-assessment, peer assessment and instructors are positively reflective. They are evaluated based on observations, real-world assessments, performance assessments, and discussions to evaluate learning at a conclusion stage, and learners have the opportunity to offer ways to improve themselves through reflection activities, this allows the instructor to design the characteristics of learning activities that clearly promote and develop the teacher's personality. In

exchange for learning, this is consistent with the creation of the professional learning community (PLC) to play an important part in organizing the learning process, and it can happily lead to goals for students, teachers, academics, and those involved in developing shared learning.

As, Wichan Panich (2012) describing the professional learning community as follows: professional learning community (PLC) is an ongoing process in which teachers and educators work together in a cycle of joint questioning and workshop research, to achieve better learning outcomes for students, with the belief that the heart of improving student learning lies in learning embedded in the work of teachers and educators. In line with Vorapoj Wongkijrungruang and Adhip Jittarik (2011), the professional learning community (PLC) has been described as an important strategy for learning in the 21 century, because education is good for modern people, unlike education ten or twenty years ago, quality education must radically change the learning patterns of students, and the role of teachers must change radically, teachers who love students and care about their students but also use traditional teaching methods will not be teachers who truly benefit their students, that is, teachers who are not happy enough, teachers for students to change their focus or focus from teaching to focusing on their studies (both of their students and their own), teachers who love students and take care of their students, they must also learn and improve the learning patterns they provide to their students. Teachers must change their roles from “teacher” to “coach” or “learning facilitator”, and must learn the skills to perform this function, by gathering in groups to learn together systematically and continuously, “PLC” stands for professional learning community, this refers to the community of practice (CoP) in acting as a teacher, in other words. It is a combination of working to develop skills and learning to perform teacher duties for students by combining exchanges from direct experience, making it possible to serve as teachers for students as a group or as a team, which can be teams in the same school or different schools, or it can be far away.

“PLC” is a tool for teachers to be actors who act as “presidents” to create change for the education industry, not to let teachers be “karma” (the abusers), or to liberate teachers from power relationships into flat relationships, to create change for education, as well as to create a gathering of teachers to do creative work. This includes applying PBL learning management experiences and other innovations that they experiment with to exchange with each other, creating knowledge or enhancing knowledge to serve teachers from direct experience, and comparing them to the theories that have been studied and published. At the heart of the PLC is that it is a tool for the life of teachers in the 21st century, learning in schools and universities, will have to be completely changed from the original, the teacher has to change the role from “teacher” to “coach” or teacher facilitator of learning, and the classroom has to change from a class room to working room studio, because in most school hours students will study in groups. By collaborating on a collaboration called Project-based learning, education has to go from focusing on teacher teaching to focusing on students' learning, changing from individual learning to team learning, switch from competitive-focused learning to collaborative or collaborative.

2. Research has shown that the average of students' opinions on the results of learning management of biology courses, by integrating the CCR concept of teachers, in all aspects of the overall picture, and the average is at the most appropriate level. On a side-by-side basis, it was found that the average aspect of 100% was the purpose determination, the instructor informed the purpose of learning the subject before class, and clearly informed the issues to be evaluated and the criteria for measuring and evaluating the subject before studying. In the field of teaching design and information reflecting student learning behavior towards the results of learning management in biology by integrating the CCR concept, it found that 100 percent of students accepted the most assessments from friends or teachers. Students are engaged in practical learning, group problem solving processes, students are willing and responsible for their assignments and cooperate fully, with the impression of conducting teaching is to use mental intelligence education activities to recognize themselves, understand friends, encourage each other, accept the opinions of others, listen to more than just speak, and speak when they speak, students feel more encouraged to study.

Learning using research as a base and mentoring system in activities is a question for learners to think about, set issues, analyze situations, find answers on their own, and members within the group, show solutions, or clearly find answers to problem situations, this process allows students to think more about factors and figure out why. In line with Paitoon Sinlarat concept (2006), it discusses learning management

using research as a basis for learning management by finding answers, solving problems, seeking knowledge, and innovating, using scientific processes. In this way, the instructor uses the question to provide information reflected back to the student, by allowing the student to practice analyzing their thoughts on whether it is based on cause and effect. This activity also found that students provide peer assistance, sincere back information to their peers, everyone is committed to improving themselves, using the research system as a base and mentoring system in activities as a question for students to think about, set issues, analyze situations, find answers on their own, and suggest solutions. This process allows students to know how to plan systematically and solve problems through scientific processes, and this activity also finds that students provide peer assistance, provide back information to their peers sincerely, all of whom are committed to improving themselves.

As for the problems and obstacles of classrooms that do not have proper teaching practice rooms, practical classrooms are small, teaching practices in experimental activities also lack scientific equipment that makes it difficult for learners to understand clearly, making it difficult to organize activities and affect time management. However, the overall picture of the tutorial is that the technology is used to carry out activities, whether it is using the mobile to shoot videos and upload them to the face book instantly, sending work quickly and conveniently, using the add-on application, the classroom friends can check the data back manually, which results in a very satisfying result. In line with research by Ariyaporn Kuroda (2013), who has studied the use of psychoanalytic studies in teaching students of education courses, the results showed that teaching using mental intelligence education can support the development of interest, understanding, self-control of emotions, empathy, compassion for oneself and others, and behaviors that promote and change self-learning, strengthen deeper learning and build strengths and skills within themselves.

VIII. SUGGESTION

1. Suggestions for conducting this research

1.1 Students should be allowed to lead the management of biology learning courses by integrating mental intelligence education concepts, including mentoring and learning systems, using research as a base to teach real secondary school students in educational institutions.

1.2 Teachers should organize the teaching conditions and atmosphere as conducive to student learning as possible, encourage students to do activities with their peers, have discussions and exchange ideas, while encouraging students to find knowledge outside the classroom on topics that interest students using electronic media, and encourage students to express themselves freely in class.

1.3 Use a more diverse learning environment, such as allowing learners to experiment with scientific operations in real laboratories.

2. Suggestions for further research

Research and development of learning management should be conducted in other subjects by integrating mental intelligence studies concepts, including mentoring and learning systems, using research as a base.

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