Developing Research Skills of the Third Year Teacher Students Using RTI MODEL

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Abstract

This research aimed to 1) develop the research skills of the third year students, and 2) develop teaching method by using RTI MODEL for suitable instruction. The samples were 44 third year students who took social study major from the faculty of education by cluster random sampling. The research instruments were (1) 4 cycles of lesson plans using RTI MODEL with 3 tiers intervention, (2) the students' research skills assessment form, (3) the students' research skills checklist that using while using 4 cycles of lesson plans, and learning reflection form. The research results revealed that: 1)The students' research skills were higher before learning, they had better research skills from high to low such selecting data, questioning for information retrieving/conclusion, collecting data, presenting the data, reflection and evaluating the data, and the students identified that they got better research skills because they had chances to do repeated, receiving the recommendation and guidance, moreover, identifying the questions for information retrieving help them seen the clearly steps for doing the assignments, studying by themselves, assessment by self, peer-assessment and teacher assessment made them receive the feedback improve their assignments. Implementing the research skills to learn the contents from the general subject helped them understand and remember better than learning by doing the report with non-using research skills. 2) The teaching method was integrating the 8 research skills by using RTI MODEL and multi-tiers intervention. The highlighting about giving the guidance from low to high, different assessment, product, and feedback to improve the assignments.

Keywords: research skills, RTI MODEL, multi-tiers intervention, classroom action research

Introduction

The changes in society, economy, political rules, and environment of Thailand is happening at a fast pace because globalization is intertwining with every aspects of Thai's fabric of livings. Inevitably, Thailand is automatically compelled to participate and compete in numerous international challenges. In order to keep up with such a rapid transformation, the concept of lifelong learning was introduced in the 11th National Plan for the Development of Economy and Society. Lifelong learning scheme aims at encouraging every Thai people to have compassion for acquiring knowledge and to render contribution of building high- quality learning - oriented society which sustains the good learning-oriented environment for Thai people throughout their lives (Office of the National Economics and Social Development Board, 2011). In the current situation, it is known that students in a same class have diverse learning capabilities. Such National Education Act B.E. 2542 (1999) and Amendments (Second National Education Act B.E. 2545 (2002)) Section 22 Education shall be based on the principle that all learners are capable of learning and self-development, and are regarded as being most important. The teaching-learning process shall aim at enabling the learners to develop themselves at their own pace and to the best of their potentiality. Moreover, the teachers should have the knowledge and abilities to do the research such Section 30 Educational institutions shall develop effective learning processes. In so doing, they shall also encourage instructors to carry out research for developing suitable learning for learners at different levels of education. Including Section 52 the Ministry shall promote development of a system for teachers, faculty staff, and educational personnel, including production and further refinement of this category of personnel, so that teaching will be further enhanced and become a highly respected profession. The Ministry shall, in this regard, take a supervisory and co-coordinating role so that the institutions responsible for production and development of teachers, faculty staff, and educational personnel shall be ready and capable of preparing new staff and continually developing in-service personnel (Office of the National Education Commission, 2003). Therefore, all teachers need to find out about the various ways to help all the students learn.

Recently, the teacher education system in Thailand will be reformed radically based on the Thai Qualification Framework for Higher Education (TQF:HED) was launched in 2008. According to the National Education Act 2542 (B.E.) (1999) and Amendments (Second National Education Act B.E. 2545 (2002), TQF:HED is a mechanism for higher education quality assurance and is intended to develop of the quality students in the higher education system. The implementation of the TQF poses substantial challenges to teaching and learning. These include endemic difficulties in integrating theory and practice, and the shifts of focus of activity and efforts from documentation to the quality of teaching and learning itself. Other challenges relate to recent and significant changes nature of Thai higher education which have had considerable impact on the design of teaching strategies, learning activities and assessment as supported by optimal teaching standards. Learning outcomes are statements of the attributes and capabilities that a student should have achieved on successful completion of the learning session or topics. They provide a reference point for assessing students' progress and designing assessment strategies and methods. Learning outcomes are helpful benchmarks for the standards educators will apply when measuring students' achievement using various assessment instruments and process (Pimpa & Moore, 2012). In England higher education, the students'

learning improved when the learning environment was modified to allow students to construct personally relevant knowledge and to engage in the materials at different levels and different points of view (Dearing, 1997).

Drawing from evidences, the quality of graduates can be ensured by means of the implementation of sound teaching strategies tailored for students of diverse backgrounds. In addition, assessment tasks offer important to enhance students' learning experiences. Taking approaches which recognize this evidences, and focusing on encouraging learning and measuring progress in relation to learning outcomes, supports students to achieve key competencies (Pimpa & Moore, 2012). Learning outcomes mentioned above comprised of 6 domains for bachelor degree in education such 1) ethics and moral, 2) knowledge, 3) cognitive skills, 4) interpersonal skills and responsibility, 5) numerical analysis skills, communication, and information technology, and 6) learning management skills. (Udon Thani Rajabhat University, 2012). At the same time, its main issue is to change the standard term of the teacher education from 4 years bachelor degree level to 5 years course. So, this will be the problem regarding how to apply teaching standards and strategies for teacher education, to meet graduate outcomes outlined by the TQF, to current needs such research skills and students contexts.

According to research skills is one of the professional standard for teachers in the following areas: language and technology for teachers, curriculum development, learning management, psychology for teachers, educational measurement and evaluation, classroom management, educational research, educational innovation and information technology, and teacher ship (Secretariat Office of Teachers' Council of Thailand, 2003). And Bluma (n.d.) stated that in the answering to the needs of the teaching profession, development of critical thinking, the ability to reflect and research skills need to develop these skills during the learning process at the university. So, the students can use them in every course. Faculty of Education at Udonthani Rajabhat University, especially the bachelor degree of social study emphasized applying research skills as a key component for learning process (Udon Thani Rajabhat University, 2012). Moreover, National Research Council of Thailand (2010) stated about the research that is very important, for example, integrating research-based instruction, and developing research skills for informal education and non-formal education. Studying about research skills founded that there are many educators who divide the research skills in various components, such as, Lovat, Davies and Plotnikoff (1995) dived research in to the components in literature skills, and Wilson and O'Reagan (2006) divided research skills in six categories: recognition of a need for knowledge or understanding, use of appropriate methodology to find or generate needed data, critical evaluation of data and data generation processes, organization of data, synthesis, analysis and application of new knowledge, and communication of knowledge and understanding.

Nowadays, there is newly innovation that all teachers should know which so called Responsiveness to Intervention (RTI) that use multi-tiered intervention correlated with the students' abilities. Responsiveness to Intervention successfully applied in many cases and for all professional education programs because the intervention integrated the knowledge and skills set into the curriculum and clinical experience. In conclusion, RTI is the practice of providing high quality instruction and intervention match to students' need, progress monitoring frequently to make decision about

changes instruction or goal, and approach to meet all students (Maureen, 2011). Moreover, RTI is an approach for redesigning and establishing teaching and learning environments that are effective, efficient, relevant and durable for all students, families, and educators. And also, RTI is a general education initiative that has 3 important parts: 1) using 3 tier model of school supports, 2) using problem solving method for decision making, and 3) using data to inform instruction (National Association of State Directors of Education, 2006). Many educators identified the elements of RTI, for example, 1) universal screening, 2) instruction or intervention, 3) progress monitoring, and 4) decision making (Copenhaver, 2006; Stoehr, Banks & Allen, 2011).

The good activities for teacher development program from the extensive studies that involved the leadership development for teachers lead to conclude that general activities should comprise of 1) development of activities using school as a foundation to correct the issue which obstructs the students' learning ability, 2) development of activities encouraging the compromised cooperation among every educational members in order to build the strong social affiliation within a school where goodwill of knowledge are attributed equally for all members. This concept indicate the level of expertise in a curriculum creation and has to comply with the concept of social platform as a learning center, 3) development of activities which should be open, 4) development of rules which collects information by inquiring about planning, implementation, and reflection of the action gained from the results of analyzing of the occurring problems, and 5) leadership development of activities which are continuous and well-ordered that supports the culture of knowledge exchange and lifelong learning (Henderson & Hawthorne, 1995; Harris, 2003).

Since human resource development in Thailand is crucially needed, according to the educational revival plan in the Second Decade of Educational Reform in 2552-2561 B.E., teachers in this new globalization era must be capable of applying strategic research for the improvement of their teaching methods that is responsive to learners whose different levels of intelligence are to be matched with multi- tiered intervention. Moreover, feedbacks between students and teachers must be consistent so that students can develop their own learning skill with their full potential and creativity in a right direction. In this research, there are two issues to be addressed: Firstly, How are the teacher students' research skill? Secondly, what are the processes required for research skills development using RTI MODEL? The implication of this research results will be used as a prototype for the development of professional learning communities joined by teachers who are actively inquisitive for the new innovative ways of teaching that help all students achieve the standard of Basic Education Core Curriculum B.E.2008.

Literature Review

Research Skills Development

From literature review, there are several ways to improve the graduate students' research skills. For example, 1) teaching research skills in general course, such, the development of students' research skills as outcomes in the teaching and learning process, so the students can use research skills in every course and the process start with the early first course at the university level (Bluma, n.d.). 2) integrating research

skills development in teacher education program. For example, the first year: literature searches and reviews focus on developmental psychology, the second year : interpretative research skills, such, (1) identifying problems in learners, and (2) organize curriculum in order to solve the problems, the third year: focus on the sociological issues and curriculum theory and need to practice teaching 3 times in the class, the fourth year need to do independent research project (Lovat, Davies & Plotnikoff, 1995). 3) teaching research skills with some teaching innovation like metacognitive ability (Niedringhaus, 2010), and 4) embedding research skills in undergraduate training program based on project (Cattani, Kalaga & Reid, 2009).

For measuring the research skills, many educators assessed the research with various methods as follows: 1) using self-report ; rating scale (Gilmore & Feldom, 2010), 2) RSD approach: students' self-assessment of research skills gained by using questionnaires; academics' measures of students' research skills, and development during course using rubric structure; interview students' research skills after completion a course; and interview academic using research skills (Willison, Peirce & Ricci, 2009).

RTI MODEL

According to RTI consisted of three core elements of the response to intervention approach such, an emphasis on students outcomes, systematic and data-based decision making, and team work for educational course design both general and special education (Pavri, 2010). There are many researches about RTI founded that RTI is use for prevent students from difficulties and problem in academic and behavior domain. Especially, RTI research carried out from kindergarten to secondary education. Such, the research by Marija, Lidija and Simona (2000) the first level (tier-1) involves the prevention of complication regarding mathematical perception in every students by screening out students who are at risk failing to grasp mathematical concepts. In this level mathematical teaching activities is set for every students in a normal manner. The second level involves helping students who are at risk by setting up supplementary classes for them during the extra period. The two-tier intervention significantly reduce the number of students having difficulty in mathematics. In Thailand, Jansrisukot (2010) has developed a mathematics intervention system for students at risk in mathematics difficulties particularly applicable for 1st grade students in the elementary school. The research results revealed that 1) mathematics intervention system comprised of 3 elements: (1) identification (2) two-tier mathematics intervention and progress monitoring and (3) learning assessment. 2) The mechanism for mathematics intervention system's instruments included (1) screening test for students at risk in mathematics difficulties (2) lesson plans that used in the system which included mathematics lesson plans for inclusive classroom and remedial mathematics lesson plans (3) a set of test for monitoring a progress in mathematics (4) mathematics achievement test (5) mathematics self-confidence scale.

Methods

The research design was classroom research and the samples were 44 third year students from the faculty of education, who take an inclusive education course in the second semester of the academic year 2012 by cluster random sampling. The research conducting was separated into 3 phases: *Phase 1)* the study of basic information,

Phase 2) the development of research skills consisted of 4 steps: 1) plan, 2) act, 3) observe, and 4) reflect, and *Phase 3)* the assessment and reflection on research skills development. The data analysis consisted of analyzing quantitative data by percentage, mean, standard deviation, and t-test for dependent samples using, analyzing qualitative data, it was summaries by content analysis using and descriptive conclusion.

Instruments

The research instruments consisted of 1) lesson plan consisted of 1 orientation plan, and 4 cycles of lesson plans using RTI MODEL with 3 tiers intervention, 2) research skills assessment form, 3) the students' research skills checklist that using while implementing 4 cycles of lesson plans, 4) and learning reflection form. The quality of these instruments were drawn from using content validity by 3 experts and content validity was determined by obtaining the item-objective congruence (IOC) value for each item of each instrument. These research instruments were used with non-samples teacher students to find out about the problems in order to improve them before data collection.

Results

The research conducting was separated into 3 phases: *Phase 1)* the study of basic information, *Phase 2)* the development of research skills consisted of 4 steps: 1) plan, 2) act, 3) observe, and 4) reflect, and using RTI Model with 3 tiers intervention such, tier-1 low guidance, tier-2 moderate guidance, and tier-3 high guidance. *Phase 3)* the assessment and reflection on research skills development. The results were as follows:

Section 1: teacher students' research skills
I conducted a t-test for dependent samples on pre, and post- test scores on research skills self-assessment. A comparison of means between pre, and post- test scores on research skills self-assessment as shown on table 1, figure 1, and table 2.

Table 1 Pre and post-test research skills (Total score 220 scores)

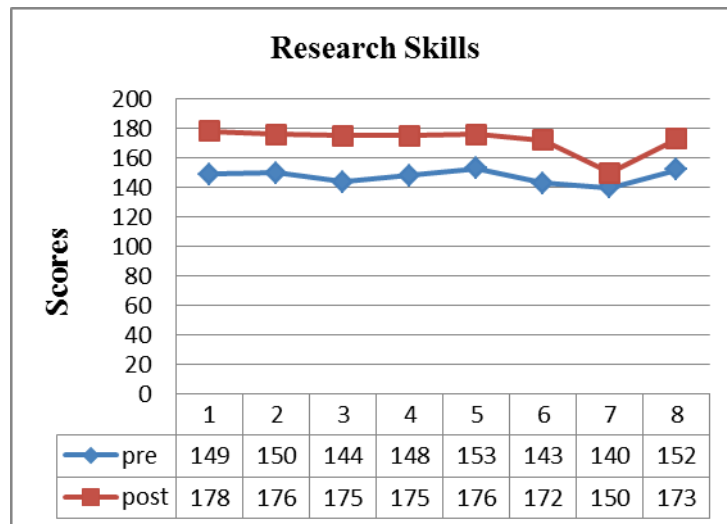| Research Skills	Pre	Post	Post−Pre
1. questioning for information retrieving	149	178	29
2. determination of resources	150	176	26
3. data selection	144	175	31
4. data collection	148	175	27
5. data presentation	153	176	23
6. conclusion	143	172	29
7. data assessment	140	150	10
8. learning reflection	152	173	21

Figure 1: Pre and post-test research skills

From table 1, and figure 1 showed that when we focused on the scores of the students' research skills in each item, founded that the research skills which shown the results of more and less progress were as follows: 1) data selection, 2) questioning for inquiring and conclusion (same score), 3) data collection, 4) determination of resources, 5) data presentation, 6) learning reflection, and 7) data assessment

Table 2
Comparisons of the third year students 'research skills by test

Test	Numbers	Mean	SD	Percentage	t
Pre	44	26.80	3.42	67	6.029**
Post	44	31.25	3.57	78.13	

**p < .01

From table 2 showed that the 44 third year students' pre-test and post-test scores on research skills were 67% and 78.13% respectively. The mean score on post-test was significantly higher than that of the pre-test at .01

Section 2: Teaching method for developing research skills
From the qualitative aspect, I conducted a qualitative analysis by using documentary study, action research cycle, research skills self-assessment, and the learning reflection on the third year students' research skills were shown as the followings:

1. Teaching methods for developing research skills

From documentary study and an performing 4 action research cycle on research skills development founded that the steps of teaching research skills for general subjects comprised of 1 orientation plan that using for giving the information about 4 action research cycle and RTI Model with 3 tiers intervention, and 4 lesson plan consisted of 3 main steps: 1) launching which consisted of (1) plan was the step for designing in order to use research skills for learning content from the course and implementing content learned in authentic situation (regular schools and inclusive schools), and (2) act was the lesson plans implementation that the teacher and students made a

commitment. 2) presentation consisted of observe which was the step that the students have to present their work, and teacher act as a facilitator in order to give the students 3 tiers intervention from low to high guidance which comprised of (1) Tier-1 low guidance: teacher and students made a plan for inquiring together in-class activities, (2) Tier-2 moderate guidance: the teacher gave small groups advice outside-class activities while they were doing the task and up to the their needs, and (3) Tier-3 high guidance: the teacher gave the advice for individual students outside-class activities after doing the task and up to individual needs, and 4) reflect was the step that students discuss about their own work and the peers' work in order to gather the information to find out the strong and weakness of the work. And 3) Conclusion was the step for students to construct the knowledge learned from doing the task, and reflected the information for planning to solve the next task.

2. Research Skills Self-Assessment

The teacher students' research skills which shown the results of more to less progress were as follows: 1) data selection, 2) questioning for inquiring and conclusion (same score), 3) data collection, 4) determination of resources, 5) data presentation, 6) learning reflection, and 7) data assessment.

3. Learning Reflection on The Third Year Students' Research Skills

The factors which helped students to be successful in developing research skills better than before learning were as the follows: 1) attaining the feedback and guiding from peers and teacher made them concern about reviewing their works, 2) studying by self to know more contents from texts, journals, and websites, 3) Implementing knowledge from inquiring in schools, 4) inquiring from questioning is good technique, 4) comments and motivation from teachers, 5) awareness on inquiring, 6) studying in real situation such as observe class in regular and inclusion schools, and 7) re-inquiring about 3 times helped them concerned on assessment of the mistakes. Furthermore, the strongly supported teaching method to be successful in developing students' research skills was as follows: 1) the teachers acted as a facilitator while performing the activities, 2) implementation of RTI Model with 3 tiers intervention suited for students of diverse backgrounds.

Discussion

1.The mean score of teacher students' research skills in this research before learning by using RTI Model with 3 tiers intervention was 26.80 and after learning by using RTI MODEL with 3 tiers intervention, the teachers students' research skills was 31.25, and the mean score on post-test was significantly higher than that of the pre-test, possibly because of 1) the teaching method that used in this research was developed by using 4 cycles of action research and RTI MODEL with 3 tiers intervention, that related with the teacher students' education needs. And also, the teacher students have experiences from peers and teacher feedback for their working with the assignments every time that can help them work systematically by the learning activities such, 1) attaining the feedback and guiding from peers and teacher made them concern about reviewing their works, 2) studying by self to know more contents from texts, journals, and websites, 3) Implementing knowledge from inquiring in schools, 4) inquiring from questioning is good technique, 4) comments

and motivation from teachers, 5) awareness on inquiring, 6) studying in real situation such as observe class in regular and inclusion schools, and 7) re-inquiring about 3 times helped them concerned on assessment of the mistakes. Therefore, they able to do the assignments by themselves and able to finish the assignment perfectly by themselves. It was supported by Angelo and Cross (1986) stated that classroom assessment can help the teacher progress monitoring in the classroom. In addition, it can help students learn better and the teacher teach effectively. Moreover, it was supported by the findings of Lovat, Davies and Plotnikoff (1995) that studied about integrating research skills development in teacher education by longitudinal study, the subjects of which were a cohort of students moving to the first three years of teacher education program in order to assess the research skills development for pre-service teacher program. It showed that firstly, it would seem that these students have entered teacher education lacking basic skills deem necessary for eventual research competence, and secondly, the students' self-perception, these skills have been developed to a reasonable extend by the time they are required to engaged in their independent study.

2. The teaching method for developing research skills of teacher students

The results revealed that the steps of teaching research skills for general subjects comprised of 1 orientation plan that using for giving the information about 4 action research cycle and RTI Model with 3 tiers intervention, and 4 lesson plan consisted of 3 main steps: 1) launching which consisted of (1) plan was the step for designing in order to use research skills for learning content from the course and implementing content learned in authentic situation (regular schools and inclusive schools), and (2) act was the lesson plans implementation that the teacher and students made a commitment. 2) presentation consisted of observe which was the step that the students have to present their work, and teacher act as a facilitator in order to give the students 3 tiers intervention from low to high guidance which comprised of (1) Tier-1 low guidance: teacher and students made a plan for inquiring together in-class activities, (2) Tier-2 moderate guidance: the teacher gave small groups advice outside-class activities while they were doing the task and up to the their needs, and (3) Tier-3 high guidance: the teacher gave the advice for individual students outside-class activities after doing the task and up to individual needs, and (4) reflect was the step that students discuss about their own work and the peers' work in order to gather the information to find out the strong and weakness of the work. And 3) Conclusion was the step for students to construct the knowledge learned from doing the task, and reflected the information for planning to solve the next task, possibly because the methods were used consistent with sound teaching strategies tailored for students of diverse backgrounds by guiding with 3 tiers. From the activities that used in and out of the classroom, the teacher act as a facilitator and a researcher. In addition, assessment tasks offer important to enhance students' learning experiences. Taking approaches which recognize this evidences, and focusing on encouraging learning and measuring progress in relation to learning (Pimpa & Moore, 2012). Moreover, it was supported by the findings of Stenhouse (1975), it showed that the teacher should change their roles to a researcher for developing their teaching abilities by using inquiry based or evidences based.

Conclusion

This research was a course redesign in teacher education for professional development enhancing the teacher students' research skills. The findings were concluded as the followings:

1. The mean score of teacher students' research skills were higher before learning, they had better research skills from high to low such selecting data, questioning for information retrieving/conclusion, collecting data, presenting the data, reflection and evaluating the data, and the students identified that they got better research skills because they had chances to do repeated, receiving the recommendation and guidance, moreover, identifying the questions for information retrieving help them seen the clearly steps for doing the assignments, studying by themselves, assessment by self, peer-assessment and teacher assessment made them receive the feedback improve their assignments. Implementing the research skills to learn the contents from the general subject helped them understand and remember better than learning by doing the report with non-using research skills.

2. Teacher students' research skills divided into 8 items; 1) questioning for inquiring, 2) determination of resources, 3) data selection, 4) data collection, 5) data presentation, 6) conclusion, 7) data assessment, and 8) learning reflection.

3. The teaching method was integrating the 8 research skills by using RTI MODEL and multi-tiers intervention. The highlighting about giving the guidance from low to high, different assessment, product, and feedback to improve the assignments.

Recommendation

For the successful and sustainable professional development for teacher students, the teachers should prepare the core course for all teacher students with 8 research skills as the following: 1) provide the innovation that suit for solving the problems in the real classroom in order that the students should solve the problems by using research skills, and then if the problems occurred while using research process, meeting the experts was necessary, and 2) providing the session of the learning reflection after doing and implementing the knowledge learned from inquiry with 8 research skills after the first task in order to design assignments for the next task.

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