Development of a Professional Activity Model on Readiness Preparation to Enhance Student Teachers' Desirable Characteristics for an Industrial Education Program in Agricultural Education

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ABSTRACT

The main purpose of this research was to develop a professional activity model on readiness preparation to enhance student teachers' desirable characteristics for an industrial education program in agricultural education. It was divided into 4 steps: (1) studying fundamental data; (2) constructing and validating a professional activity model; (3) verifying the professional activity model with 39 student teachers from the Industrial Education Program in Agricultural Education at the King Mongkut's Institute of Technology Ladkrabang; and (4) evaluating the student teachers satisfaction with the model. The collected data were analyzed through qualitative and quantitative data analysis techniques. The results revealed that two aspects of desirable characteristics are: (1) communication and using information technology and (2) learning design by five stages of guidelines in the process of activity arrangement; survey, observation, decision-making, action, and, reflection—the so-called SODAR model. The professional activity model consisted of 7 factors: background, fundamental concepts in development, principles, objectives, structure and content, activity arrangement, and evaluation using the SODAR model which was applied to the factors of activity arrangement and it was verified at a high level of possibilities and appropriateness. The student teachers' desirable characteristics were higher than before: (1) communication, using information technology, and learning design after participation in the activities were higher at a significant level of .01; (2) skills in communication, using information technology, and learning design after participation in the activities were higher than those in the set criteria by up to 75 percent at a significant level of .01; (3) attitudes toward communication, using information technology, and learning design after participating in the activities were higher at the significant level of .01; and (4) the professional activity model was evaluated as providing a high level of satisfaction.

Keywords: professional activity model, desirable characteristics, readiness preparation, professional teaching experiences

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนารูปแบบกิจกรรมเตรียมความพร้อมการออกฝึกประสบการณ์วิชาชีพเพื่อส่งเสริมคุณลักษณ์ที่พึงประสงค์สำหรับนักศึกษาหลักสูตรครุศาสตร์อุตสาหกรรมบัณฑิต สาขาวิชาครุศาสตร์เกษตร ดำเนินการวิจัย 4 ขั้น ดังนี้ (1) ศึกษาข้อมูลพื้นฐาน (2) สร้างและตรวจสอบรูปแบบ (3) ทดลองใช้รูปแบบกิจกรรมกับนักศึกษาหลักสูตรครุศาสตร์อุตสาหกรรมบัณฑิต สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง จำนวน 39 คน และ (4) ประเมินรูปแบบกิจกรรมโดยประเมินความพึงพอใจของนักศึกษาที่มีต่อรูปแบบกิจกรรม วิเคราะห์ข้อมูลด้วยเทคนิคการวิเคราะห์ข้อมูลเชิงปริมาณและเชิงคุณภาพ ผลการวิจัยพบว่า คุณลักษณ์ที่พึงประสงค์มี 2 ด้าน ได้แก่ (1) ด้านการสื่อสารและการใช้เทคโนโลยีสารสนเทศ และ (2) ด้านการจัดการเรียนรู้ โดยมีแนวทาง กระบวนการในการจัดกิจกรรม 5 ขั้นตอนได้แก่ การสำรวจสิ่งที่จะปฏิบัติ การสังเกตตัวแบบ การพิจารณาและตัดสินใจการกระทำสิ่งที่เลือกในแบบฉบับเฉพาะตน และสะท้อนผลการประเมินแนวทางปฏิบัติ ซึ่งเรียกว่า รูปแบบ SODAR รูปแบบกิจกรรมการฝึกประสบการณ์วิชาชีพประกอบด้วย 7 องค์ประกอบ ได้แก่ ความเป็นมา แนวคิดพื้นฐานในการพัฒนา หลักการ วัตถุประสงค์ โครงสร้างและเนื้อหา กระบวนการจัดกิจกรรม และ การวัดและประเมินผล โดยนำรูปแบบ SODAR ประยุกต์ใช้ในองค์ประกอบของกระบวนการจัดกิจกรรม ผลการตรวจสอบคุณภาพโดยผู้เชี่ยวชาญพบว่ารูปแบบมีความเหมาะสมและสอดคล้องอยู่ในระดับมาก ผลการทดลองใช้รูปแบบกิจกรรมที่พัฒนาพบว่า นักศึกษามีคุณลักษณ์ที่พึงประสงค์หลังเข้าร่วมกิจกรรมสูงกว่าก่อนเข้าร่วมกิจกรรมตามรูปแบบที่พัฒนาขึ้นโดย (1) นักศึกษามีความรู้ ความเข้าใจและการนำไปใช้เกี่ยวกับการสื่อสารและการใช้เทคโนโลยีสารสนเทศและการจัดการเรียนรู้หลังเข้าร่วมกิจกรรมสูงกว่าก่อนเข้าร่วมกิจกรรมอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 (2) นักศึกษามีทักษะปฏิบัติด้านการสื่อสารและการใช้เทคโนโลยีสารสนเทศ และด้านการจัดการเรียนรู้หลังเข้าร่วมกิจกรรมสูงกว่าเกณฑ์ร้อยละ 75 อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 (3) นักศึกษามีเจตคติต่อการสื่อสารและการใช้เทคโนโลยีสารสนเทศและด้านการจัดการเรียนรู้หลังเข้าร่วมกิจกรรมสูงกว่าก่อนเข้าร่วมกิจกรรมอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และ 4) ผลการประเมินรูปแบบกิจกรรมพบว่านักศึกษามีความพึงพอใจต่อการจัดกิจกรรมตามรูปแบบกิจกรรมที่พัฒนาขึ้นอยู่ในระดับมาก

คำสำคัญ: รูปแบบกิจกรรมมืออาชีพ คุณลักษณ์ที่พึงประสงค์ การเตรียมความพร้อม การฝึกประสบการณ์วิชาชีพ

INTRODUCTION

The Ministry of Education has determined important issues which must be accelerated as a part of education reform in the second decade of this century (2009–2118) comprising: (1) developing the quality of Thai people in the new age; (2) developing the quality of teachers in the new age; (3) developing the quality of educational institutions and learning sources in the new age; and (4) developing the quality of managerial administration (Office of the Education Council, 2009). The 1992 National Education Act has determined teacher reform for the whole system as identified in chapter 7, sections 52–57 (teachers and educational personnel). Section 52 requires the Ministry of Education to have systems for the processing and development of teachers as well as for educational personnel. These must meet the appropriate standard and quality required for professionals. The process will entail supervision and coordination to create an organization that can produced and develop teachers/ educational personnel to be ready and strong (Pitiyanuwat, 2000).

The Faculty of Industrial Education at King Mongkut's Institute of Technology Ladkrabang has the main task of producing teachers of industrial technicians and their quality must be in accordance with the Thailand Quality Framework: Higher Education (TQF: HEd). Furthermore, graduates must be at the standard with knowledge and experience as determined by the Teacher Council. That is, the teachers of industrial technicians must study in the Industrial (5 year program) course. This conforms to the researcher's synthesis on the desirable characteristics of the TQF: HEd (Education). The conclusions from the interview with scholars and graduate employers, revealed that the graduates of the industrial education program have the desirable characteristics as mentioned earlier. However, they are still not clear on some aspects. One aspect that should be developed is communication skills using information technology. Examples include using information technology for communication and knowledge seeking and learning facilitation (e.g., classroom preparation, problem solving in the classroom, and classroom research for learner development). These characteristics can enhance student attempts to have high working potential. Furthermore, they will be able to develop their abilities for progressive professional teaching. Therefore, the current researcher attempted to develop the professional activity model to be ready for practicum teaching. This truly can fulfill the potential of a good teacher to be ready for further educational development.

Objective of the Study

The main purpose of this research was to develop a professional activity model on readiness preparation to enhance student teachers' desirable characteristics for an industrial education program in agricultural education.

REVIEW OF RELATED LETERATURE

Theories concerning the development of desirable characteristics of students

Bandura (1977) stated that most behavioral manifestation learning by humans arises from model observation and assimilation. This was particularly so for the model behavior that was reinforced. The said learning may arise even though there was no immediate manifestation of behavioral assimilation from the model.

Raths, Harmin and Simon (1978) claimed that to clarify values is a process in which an individual can choose values by relying on beliefs, feeling, and behavioral analyses. This aims to choose what behavior is to be manifested when there is a need to choose. In addition, it helps to determine whether such behavior choosing is reasonable or not .

Chickering and Reisser (1993) proposed seven factors of development for students: (1) ability development, (2) emotional control development, (3) self-independent development leading to self-reliance, (4) mature development of relationships with others, (5) identity construction, (6) goal development, and (7) virtue development.

Astin (1984) claimed that if students had a high level of participation in academic study, activities of special curricular programs, and they would gain much in experience and development. In contrast, they would gain less experience if they had a low level of participation.

Teacher profession training

King Mongkut's Institute of Technology Ladkrabang (KMITL) has determined the objectives of teacher profession training as follows: (1) the students can apply theories which they have learned to actual situations which they are practicing and to existing problems; (2) the students have an opportunity to investigate task management in

schools, problems, and methods of problem solving; and (3) the students can adapt themselves to society and create a good relationship with other school personnel. (Committee of Practicum Teaching Management, 2010).

Related research

Srisang (2008) conducted a study on the development of a learning facilitation model of a social psychology subject using the community and experience as a basis for the enrichment of the desired characteristics of graduates. The study found that; (1) the model consists of two periods and (2) instilling the desirable characteristics in graduates after they have learnt about the facilitation model. The following were found: the students had a high level of cognitive, psychomotor, and domain aspects. However, observation skill was found at the highest level.

Yaemthongkham (2009) conducted a study on the development of a model for the reinforcement of teacher characteristics with teachers who had received a scholarship in the promotion to increase more science and mathematics teachers. The results of the study were summarized in the A-STAR model which comprises five steps: (1) need assessment (A); (2) sharing experience (S); (3) team discussion (T); (4) action (A); and 5) reflection (R). The average mean score of desirable characteristics of teachers was higher at the end of the experiment (statistically significant at the .05 level).

Kaewurai (2011) conducted a study on the development of a learning facilitation model for quality development of learners leading to a society of virtue, wisdom, and learning. The results of the study were: (1) learning through the developed model resulted in the students gaining knowledge (80% of students) and understanding the techniques of creative thinking development (80% and above); and (2) it was found that the model had a very high level of appropriateness.

METHODOLOGY

Step 1. Studying fundamental data about desirable characteristics. This was conducted by an interview with five scholars in characteristic development as well as with 15 graduate users (school directors and the students' mentors). In addition, a focus-group discussion was conducted with 20 students majoring in agricultural education concerning the model and methods to facilitate activities.

Step 2. Constructing and validating a professional activity model by:

1. Constructing a professional activity model in four steps: (1) summarizing data collection in the study step 1, (2) drafting a professional activity model, (3) constructing a professional activity model and documentation of a professional activity model, and (4) checking the quality and documentation of the professional activity model.

2. Validating model by seven experts and testing by 39 student teachers who were not in the sampling group. 2.1 Quality of the professional activity model was assessed for appropriateness and consistence by seven specialists in the development of the model and teaching training. Verification was undertaken at a high level and adjustments made as required. 2.2 Assessment of the appropriateness and consistency of the professional activity model using a pilot study with 39 third-year college students majoring in Agricultural Education at the Faculty of Industrial Education, KMITL.

Step 3. Verifying the professional activity model by a trial with 39 fourth-year college students majoring in Agricultural Education at the Faculty of Industrial Education, KMITL (academic year 2012) The desirable characteristics were measured before and after the experiment.

Step 4. Evaluating the professional activity model using 39 fourth-year college students majoring in Agricultural Education at the Faculty of Industrial Education, KMITL (academic year 2012).

Data analyses

Step 1. Explore needed basic data by using content analysis and the construction of inductive conclusions.

Step 2. Construct and check the quality of the professional activity model. Appropriateness and consistency of the professional activity model were obtained by:

1. Data analysis of the appropriateness of the professional activity model and documentation on the professional activity model ($\overline{X}$ = 3.51 and above, SD ≤ 1)

2. Data analysis of the consistency of the professional activity model and documentation on the professional activity model. Mean of the opinion level must be 0.50 and above (consistency). If less than 0.50, it must be improved based on suggestions.

Step 3. Trial the professional activity model.

1. Examine the difference between knowledge/understanding and the adoption before and after the activity participation. Use a *t*-test for the dependent sample.

2. Find the mean and standard deviation of the obtained score of practice skill. Use a *t*-test for one sample and the statistical package for the social sciences program (compare with 75 percent out of the total score).

3. Compare the attitude of the students before and after the adoption of the professional activity model using a *t*-test for the dependent sample and the statistical package for the social sciences program.

Step 4. Evaluate the professional activity model by an analysis of student satisfaction with the professional activity model by finding mean ($\overline{X}$) and standard deviation (SD) ($\overline{X}$ = 3.51 and above SD ≤ 1).

RESULTS

Part 1 Results of the study on desirable characteristics

Basic data on the desirable characteristics were obtained from interviews with the experts and the graduate users as well as from student group discussion about the professional activity model.

1. The data obtained from the scholars and the graduate users showed the students' opinions were consistent on the development of the desirable characteristics in two aspects: (1) communication and using information technology–using information technology for communication and knowledge seeking; producing teaching media and (2) learning management–classroom preparation for learning; problem solving in the classroom; and classroom research for learner development. The experts and the graduate users suggested that teaching observation should be conducted in actual situations.

2. Data obtained from the student group discussion. It was found that the students wanted to join the activities providing theoretical knowledge for 1–2 hours and then practice. The resource person should have a large amount of knowledge and experience to be transferred.

Part 2 Outcomes of the construction and quality checked by the specialists

It was found that the professional activity model had a high level of appropriateness ($\overline{X}$ = 4.45, SD = 0.42). All components of the professional activity model were consistent with each other (0.71 –1.00). The principles, objectives, content structure, activity process, and measurement/evaluation are shown in Figure 2.

Part 3 Results of the adoption of the professional activity model

1. The students had knowledge and could communicate/use information technology as well as manage their learning after joining the professional activity model at a level that was higher than before (statistically significant at the .01 level).

2. The students used communicative skills and information technology and could manage their learning which was higher than 75 percent, meeting a statistical significant level of .01 (Table 2).

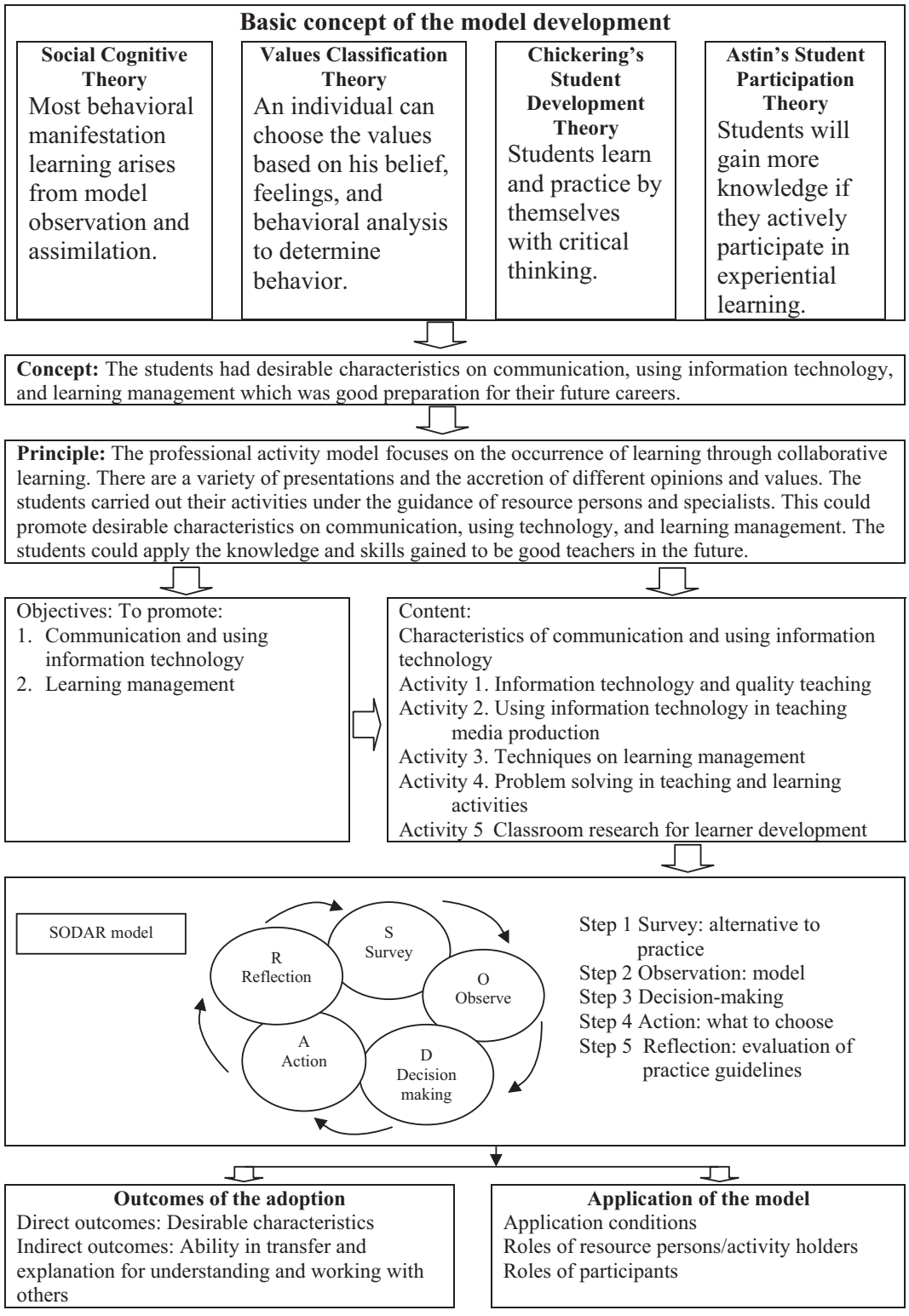

Figure 2 Professional activity model on preparing readiness for practicum teaching and promoting desirable characteristics of agricultural education students

3. The students had a higher level of attitude toward desirable characteristics on communication, using information technology, and learning management after joining the professional activity model, with a statistically significant level of .01 (Table 3).

Part 4 Results of the evaluation of the professional activity model

The students had a high level of satisfaction with the activity model ($\bar{X}$ = 4.10, SD = 0.35) and the students were satisfied with the level of output at the highest level with an average of $\bar{X}$ = 4.17, followed by the inputs with mean $\bar{X}$ = 4.13 and the process with mean $\bar{X}$ = 4.09, as shown in Table 4.

DISCUSSION AND CONCLUSION

Basic data on characteristics needed for professional activity model development

The results of the analysis on the desirable characteristics needed for the development of agricultural education students were sorted into two aspects: (1) communication and using information

Table 1 Comparison of students' ability in communication and using information technology before and after joining the activities

Action	$\bar{x}$	SD	*t*	*p*
Before joining the activities	33.79	6.91	8.77**	0.00
After joining the activities	40.64	4.36		

Sample size, n = 39; total score = 60; ** $p < .01$

Table 2 Students' scores of practice skills in communication, using information technology and classroom learning management

(n = 39)

Practice skills	Total score	Criteria 75 %	$\bar{x}$	SD	t	*p*
Communication and using information technology						
Activity 1	4	3	3.87	0.63	11.00**	0.00
Activity 2	4	3	3.82	0.58	11.43**	0.00
Learning management						
Activity 3	4	3	3.67	0.47	15.28**	0.00
Activity 4	4	3	3.97	0.56	17.00**	0.00
Activity 5	4	3	3.95	0.72	19.06**	0.00
Total	20	15	19.28	0.72	28.86**	0.00

** $p < .01$

Table 3 Comparison of students' attitude towards desirable characteristics before and after joining the activities

Action	$\bar{x}$	SD	t	*p*
Before joining the activities	3.78	0.37	7.70**	0.00
After joining the activities	4.16	0.52		

Sample size n = 39; total score = 5; ** $p < .01$

Table 4 Assessment of students' satisfaction with the professional activity model, according to the model

(n = 39)

Item of evaluation	$\bar{X}$	SD
Input		
Clarity of objectives for activity model	4.08	0.62
Appropriateness of content and process for student's activity	4.26	0.59
Appropriateness of managing activity	3.87	0.61
Appropriateness of documentation for student's activity	3.97	0.62
Appropriateness of media-tools	4.18	0.55
Expertise rank of trainers who provide training, communication, and information technology	4.36	0.53
Expertise rank of trainers who provide training and learning management.	4.44	0.55
Guidance expertise rank of trainer for seeking knowledge	4.21	0.61
Appropriateness of the duration for activity management	3.82	0.82
Appropriateness of location for activity management	4.13	0.69
Average total input	4.13	0.41
Process		
Implementation of appropriate activities for students	4.08	0.53
Activity management for encouraging students to learn	4.21	0.69
Participation of students' comment	4.05	0.68
Interaction between participants and trainers	4.03	0.74
Processing of activity focuses on real practice	4.08	0.77
Using the media activity helps students to learn	4.10	0.59
Activity management in each step to promote students to apply the knowledge toward real practice	4.13	0.65
Learning activities to stimulate students to express their opinions	4.15	0.58
Comprehensive measurement and evaluation	4.05	0.56
Average total process	4.09	0.43
Output		
Activities management assists students with the knowledge, communication, and information technology	4.03	0.58
Activities management assist students with the knowledge management learning	4.08	0.48
Student's satisfaction of Activity 1: information technology and quality teaching	3.97	0.62
Student satisfaction of Activity 2: using information technology on teaching media production	4.08	0.32
Student satisfaction of Activity 3: teaching on learning management	4.08	0.58
Student satisfaction of Activity 4: problem solving in teaching management	4.10	0.59
Student satisfaction of Activity 5: classroom research for learners development	4.15	0.67
Students can apply their knowledge in the classroom	4.28	0.56
Students can transfer the knowledge to others	3.97	0.53
Activity modeling will allow students to apply to real situations	4.10	0.44
Students can apply knowledge to be useful in the teacher training experience	4.23	0.66
Average total output	4.17	0.38
Total	4.10	0.35

technology and (2) learning management. These desirable characteristics were essential for the development of quality teachers and had to be consistent with TQF: HEd Agricultural Education. This is based on the skills in communication and using information technology for learning and transferring. The skill in learning management focuses on teaching planning by the appropriate planning of professional knowledge. (Faculty of Industrial Education, 2008).

Construction of professional activity model and quality checking

The professional activity model was developed based on a review of various basic data and the interviews with experts and graduate users about the desirable characteristics of the students and the professional activity model. This conformed to a study of Yaemthongkham (2009) on the four steps of development of the enrichment of desirable characteristics of science and mathematics teachers as follows: Step1: analysis of science and mathematics teachers' characteristics; Step 2: model development for enrichment of the teachers' characteristics; Step 3: trial the model; and Step 4: evaluation.

The professional activity model checking indicated that model had a high level of appropriateness and was applicable. In addition, the specialists provided suggestions for improvement and the professional activity model was trialed with a non-sample group. This trial aimed to determine the appropriateness of the content, time span, and activity media. Kaewurai (2011) developed a learning management model for learner development with regard to ethics, intellect, and learning that was checked by nine specialists. It was found that the developed model was good and suitable for the learning process reform focusing on learners.

Professional activity model trial

The comparison of knowledge, understanding, communication, using information technology, and learning management, found that the students performed better (statistically significant at the .01 level) after joining the activities. This implied that the developed professional activity model truly could develop the students. This may be because there was a group discussion with student representatives about the needs, form, and activity style. In addition, the researcher employed data obtained for the determination of the activity content. Thus, student participation resulted in a good level of learning. This conformed to Astin (1984) who studied student participation theory and stated that academic participation on teaching/learning facilitation and curricular program management must be based on learning theories and individual differences. This has an influence of the effective learning of the students. This conformed to a study of Srisang (2008) on the development of a social psychology learning facilitation model. Community and experience were used as the basis for the enrichment of desirable characteristics. After using the learning facilitation model, the following were found at a higher level for intellect, emotion, feeling, and all skills compared to before (statistically significant difference at the .05 level)

It was found that the students performed the practice skills on communication, using information technology, and learning management better than before joining the activities (higher than 75 percent, statistically significant at the .01 level). This implied that the developed professional activity model truly could develop the practice skill in both group and individual activities perhaps because the researcher had determined activities which must be done by a group of students and by an individual, (e.g. e-book production, course outline, research proposal, etc.). It could be observed that the students were willing to participate in the activities. Thus, they could learn through direct experience and make a decision to practice based on their learning style. This

conformed to Chickering's theory of student development (Chickering & Reisser, 1993) which focuses on the self-learning of students for effective development and as a result they can live happily in society.

Evaluation of the professional activity model

The students had a high level of satisfaction with the professional activity model because the students who joined the activities found that they could promote their learning and potential. Each sub-activity had a specialist giving suggestions and assistance. The outcomes of the activities were also consistent with the objectives of the practicum teaching. The Committee of Practicum Teaching Management (2010) stated that it aims to make students apply theories to the classroom activities, students, and problem solving.

RECOMMENDATIONS

Recommendations on adoption of the professional activity model

The Faculty of Education and the relevant Department should promote the adoption of the professional activity model as a basis for readiness preparation of students because it helps the students develop their knowledge, skills, attitude toward communication, using information technology, and learning management. This truly meets the needs of schools with practicum teaching students.

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