

Development of training program of drug information service for pharmacy students

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Abstract

Drug information service (DIS) training in content-based style cannot guarantee skill achievement of students. The concept of competency-based education is a new approach for training. This study was aimed to develop a competency-based DIS training program. The study composed of 3 phases; Phase 1: Synthesis of a pilot program by reviewing literature and document analysis, Phase 2: Survey of opinion on the proposed program using questionnaires to 12 qualified experts in Thailand, and Phase 3: Program improvement. In Phase 1, a competency-based DIS training program was designed comprising of 3 modules covering 7 steps of modified systematic approach used in DIS. Module 1 included step 1 (secure demographics of requestor), step 2 (obtain background information) and step 3 (determine and categorize the ultimate question). Module 2 contained step 4 (develop strategy and conduct search), and step 5 (perform evaluation, analysis and synthesis). Module 3 included step 6 (formulate and provide response) and step 7 (conduct follow-up and documentation). Depending upon background knowledge and skill of students evaluated using diagnostic test before the training; the most appropriate modules could be chosen to match individual's ability. Nine experts (75% response rate) provided suggestions toward the proposed training approach. Finally, the competency-based DIS training program was then developed according to experts' suggestions. In conclusion, the educational approach emphasizing on competency-based style of training for DIS was constructed in this study. The program of training would guarantee achievement of skills required in performing the service.

Keyword: Drug information service, competency-based training, pharmacy education, professional practice, pharmaceutical care

1. INTRODUCTION

Drug information services (DIS) has evolved from the beginning of 1960s as one of the fundamental pharmacist responsibilities. Recent trends of practice have placed pharmacists in complex roles in patient-care which necessitates a higher level of competence by all pharmacists in achieving drug information needs. DIS covers various activities related to pharmaceutical care, including answering drug information request, coordinating with pharmacy and therapeutics committee, publishing drug information to health care professionals via newsletters, journal

article or another formats, providing education for health professionals, students, and consumers.¹ A survey in the United States revealed that in curriculum DIS teaching and training courses were carried out in 84% and 91% of pharmacy schools (n=75), respectively.² Many attempts have been made to improve teaching and training of DIS skill in schools of pharmacy. Some universities, e.g., University of Kentucky³, and Southern California University and Norris Medical Library⁴ had revised the curriculum to integrate DIS skills and contents throughout the curriculum, or developed training program

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for pharmacists such as department of Drug information service, Iowa University, where a customized drug information training was set up for individual schedule between 2-12 weeks.⁵

In Thailand, pharmacy curriculums contain the DIS training program which is a part of pharmacy student clerkship. Many hospitals, including Udon thani Hospital, Mahanakorn Chiangmai Hospital, Songklanagarind Hospital and Srinakarind Hospital, have participated in DIS training. However, most of the activities in the training emphasize on quantity of student activity which cannot guarantee achievement of students' skills. This study aimed to develop a competency-based program for DIS training. The program can be designed based on background

knowledge and skill of students which can be evaluated using diagnostic test before the training. The advantage of using this model is the trainer can choose the most appropriate modules that match individual's background and adjust the training by student's ability and skill achievement.

2. RESEARCH FRAMEWORK

The Big 6 Model⁶, Davies' Instructional Model for Psychomotor Domain⁷ and principle of competency development were used as a framework to develop the DIS training program. The Kirkpatrick Four Levels of Learning Evaluation⁸ was used to design the evaluation process of training as shown in figure 1.

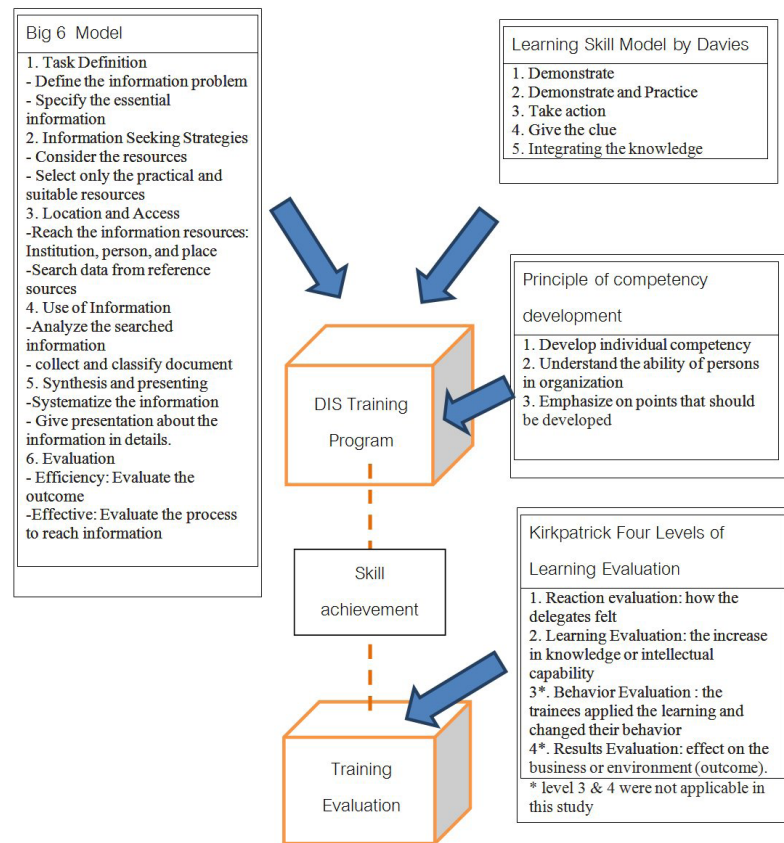


Figure 1. Research framework

3. METHODS

3.1. Study Design and Scope

Research and development (R&D) study

was carried out by synthesizing the proposed program from literature review. The proposed program was then criticized by a group of DIS experts/trainers in Thailand.

3.2. *Synthesis of the Pilot Model*

There were 2 main steps in synthesis of the pilot program for training, as follows.

3.2.1 *Document Analysis*

After literature review, three models were selected to analyze and synthesize for the competency-based DIS training program as they were highly relevant to DIS activities. The Big 6 model focuses on information literacy. Davies' instructional model emphasizes on psychomotor or learning skill training. The principle of competency development was included as it has been shown to be a new direction of training.

3.2.2 *Synthesis of the pilot model*

The competency - based DIS training program was proposed comprising of 3 components;

1) Principle; the principle was set as follows;

1.1 Modules of Training: constructed based on competency-based standard of practice/skill/ occupation. In the training, 3 modules covering 7 steps in systematic approach used in DIS were set up based on different groups of skills. Module 1 consisted of step 1 (Secure Demographics of Requestor), step 2 (Obtain Background Information) and step3 (Determine and Categorize the Ultimate Question), that mainly practiced listening and speaking skills. Module 2 included step 4 (develop strategy and conduct search), and step 5 (perform evaluation, analysis and synthesis), that principally required knowledge of resources relevant to provide DIS, skills in reading and comprehension and to locate for information, and critical thinking. Module 3 covered on step 6 (Formulate and Provide Response) and step 7 (Conduct Follow-Up and Documentation), that essentially trained on writing and verbal communication

1.2 Diagnostic test: used to identify individual's skills needed to be improved and corrected.

1.3 Material of Training: any materials necessary in real situation of practice.

1.4 Tools for evaluation: use of criteria to assess individual's skill achievement related to standard practicing.

1.5 Evaluation criteria: related to desired competency.

2) Method of training; at each step of systematic approach, the method of training included 5 parts; content, method, tools, practicing criteria/scope of working and evaluation

3) Evaluation; the grading system was used and defined grading "A" for achievement of 80% or higher and "F" for achievement of less than 50%.

3.3. *Survey of Experts' Opinion*

3.3.1 *Development of questionnaire*

1. Acquire the contents and put into a draft of questionnaire

2. Verify the contents of questionnaire by two lecturers in the faculty

3. Revise questionnaire

3.3.2 *Expert Selection and Survey conduction.*

Questionnaire and the proposed program were sent by postal mail to 12 DIS experts in Thailand who met these following criteria;

1) The person who had been chosen as a speaker in a DIS-related national conference

2) The preceptor who had strong experience in DIS training

3) The Author of an academic or a published paper in the field related to DIS.

The reminding note was sent by mail to the experts whose questionnaire was not returned within a month. The responses from the experts were analyzed and classified based on steps in systematic approach.

3.4. *Development of the Final Model*

The responses from the experts were analyzed, synthesized, and integrated into the final DIS training program.

4. RESULTS

Competency-based DIS training program was designed based on 7 steps of modified sys-

tematic approach. DIS Experts' survey obtained 9 responses out of 12 (75%) who were from Prince of Songkla University, Silpakorn University, Ubon Ratchathani University and from Khon Kaen hospital. The experts rated the module 1, 2, and 3 in the training program with mean scores of 3.8, 3.36 and 3.7 out of 5, respectively, defining in the range of moderate to good level.

In module 1, the experts provided comments to have telephone being added as one of a method of training in requesting for service. In a part of evaluation, the experts recommended that the preceptor should participate in a role play.

In Module2, the most frequent suggestions were found in the part of method used for conducting a search where there should be explanation on approach used to select appropriate textbooks. For example, keywords for searching, selection of information resources and time duration used during this practice. In any case that the requestor requires the information on side effects, adverse drug reactions, the students have to know that "Meyler's Side Effects of Drugs" is the most appropriate book to use as this book contains very specific and the most relevant information on this aspect. Experts also made comments that the information obtained from books, internets, or databases (Pubmed, ScienceDirect, etc.) must be always up-to-date. In addition, using observation as only one method of evaluation is not enough to judge whether the derived answer is reliable and correct. Student presentation should be considered as it is a good approach which can reflect the students' idea and any other deficient skills.

Concerning Module 3, the experts had suggestion the method using for practice in answering questions to be both writing and verbal communication. In addition, the preceptor should discuss with students to assure for the complete information for answering. Also, the experts suggested that the students should inquire the requestor directly about satisfaction on answer, time spent until response and applicability of the answer provided.

To develop Competency-based DIS training program, the expert's opinions were used to modify and finalize the model.

Final Program

The modified competency – based DIS training was developed according to expert's opinions. Depending upon background knowledge and skill of students evaluated using diagnostic test before the training; the most appropriate modules could be chosen to match individual's ability. Diagnostic test of this program was provided in practical examination form. Each student had 1 hour to answer at least 3 standard questions from a simulated requester. After completing the test, an answer sheet was scored by the preceptor. The score less than 80% means that the learner lacks of competency in corresponding part.

Module 1 [Step 1, 2, 3]

Step 1: Secure Demographic of Requestor

Objective:

Students will learn how to gather information from the requestor to prepare for appropriate response.

Method:

1. The preceptor gives the lecture on what kinds of questions should be asked to requestor. For example, the requestor's name, the requestor's position, E-mail or telephone number to contact.

2. Role play in pair by the preceptor acting as a requestor by face-to-face or telephone calling and the student acting as a pharmacist.

Practice criteria:

- Asking for details of the requestor's background information.

- In case that the requestor is a patient who has sensitive/fragile information such as she/he is an HIV or cancer patient, the questions should be asked very carefully by considering patient's right.

Evaluation method:

- The preceptor performs student evaluation using a check-list while the preceptor acts as a requestor and then provides feedback to the students.

Step 2: Obtain Background Information*Objective:*

Students will learn how to ask the requestor for related information which aids in clarifying the question and preparing the answer corresponding to the objective of request.

Method:

1. The preceptor provides a lecture on;
 - What kinds of questions should be asked to secure information concerning specific purpose of request
 - The resources that requestor has already looked for.
2. Role play in pair by preceptor acting as a requestor and the student acting as a pharmacist.

Practice criteria:

- Ask the requestors;
- The objective of request For example, this question is for solving patient's problem or academic purpose.
- Reference requestor has already searched.

Evaluation method:

Same as step 1

Step3: Determine and Categorize the Ultimate Question*Objective:*

Students will learn how to classify the request which aids in developing of more effective search strategy and selecting of appropriate resources

Method:

Self-study by web-based training program (The preceptor demonstrates and permits the students to discuss with and have correct understanding.

Note: Web-based training (sometimes called e-learning) is anywhere, any-time instruction delivered over the Internet or a corporate intranet to browser-equipped learners.

Practice criteria:

- Students do self-study using web-based training program.
- (The preceptor accompanies with students and assists them if they have questions)

Evaluation method:

After practicing the web-based training and discussing with the preceptors, students do exercises/quizzes in the program.

- Students perform exercises/quizzes after self-study which requires passing score of 80% or more.

Module 2 [Step 4, 5]**Step4: Develop strategy and conduct search***Objective:*

The student will learn how to develop strategy of searching and prioritize resources based on the probability of locating the acquired information using efficient time.

Method:

1. The preceptor gives a lecture on "how to select textbooks" and internet resources and what is the good searching strategy.
2. The students learn to use individual textbooks by studying content, format, index of the textbooks.
3. The students learn how to perform a search on internet.
4. The students discuss how to locate information on textbook or internet with the preceptor.

The preceptor must provide a variety types of questions for students to practice and the resources as following list;

Books

- AHFS Drug Information
- Drug Facts and Comparison
- Drug information handbook
- Meyler's side effects of drugs
- MIMS Thailand
- MIMS Annual
- Drug interaction fact

- Handbook on Injectable drugs
- Pharmacotherapy (Dipiro)
- Drugs use in pregnancy and lactation
- USP/BP pharmacopeia

Webs:

- Pubmed
- ScienceDirect
- Micromedex
- SpringerLink
- ProQuest
- Cochrane Library

Practice criteria:

- The students should be familiar with the three types; primary, secondary and tertiary; of information resources in the literature hierarchy.
- The students should be able to conduct systematic searching in time-efficient manner, starting with the tertiary, secondary and primary resources, respectively.
- In addition, students should be able to answer questions categorized in the 4 main categories; 1) Dosage recommendation 2) Adverse drug reaction 3) Compatibility and stability 4) Pregnancy and lactation. These 4 categories are the most frequently asked questions.

Evaluation method:

The preceptor perform evaluation by observing student's skills in selection of resources, and searching methodology (systematic search)

Step 5: Perform Evaluation, analysis and synthesis

Objective:

The students will learn how to perform evaluation of data acquired from resources, doing analysis data and then synthesis of response or recommendation.

Method:

Analyze and synthesize a derived answer by literature evaluation after critically analyzing the available information from textbooks or internet resources.

Practice criteria:

- Response or recommendation given back to the requestor must be based on the most up-to-date evidence available from throughout searching. All data should be gathered in an organized manner after data evaluation and analysis.
- The students present their response on the question being requested to the preceptor.

Evaluation method:

The preceptor evaluates and checks for the data obtained, evaluated, analyzed and synthesized. The brief information of potential response or recommendation must be presented to the preceptor.

Module 3 [Step 6, 7]

Step 6: Formulate and Provide Response

Objective:

1. The students will learn how to re-state the question with any pertinent background information.
2. The students will learn how to organize and construct response properly.

Method:

1. The students practice how to write the answer appropriately on the DIS answering form and also practice to provide response in verbal, e.g. communication through telephone.
2. Preceptor discussion with student for main idea of answer
3. The students practice on how to formulate response in case of controversial data or no data acquired.

Practice criteria:

- The students provide correct, concise, complete and comprehensive response.
- The students have good communication skills, including non-verbal languages and have professional looking.

Evaluation method:

- The preceptor evaluates the written response by reading and checking for the quality

of response (concise, correct, complete and comprehensive answer).

- The preceptor evaluates the verbal response using a checklist.

Step 7: Conduct Follow-Up and Documentation

Objective:

The students will learn to perform recording of question and answer provided on document and how to do the follow up on the response or feedback concerning the quality of the service.

Method:

1. Practice to follow up on the requestors' general satisfaction, the discussion should be made on what question should be asked to obtain feedback.

2. Enter the question and answer in database or file.

Practice criteria:

The students check the feedback of the requestor by inquiring the level of satisfaction and record the question and answer in database or file

Evaluation method:

The preceptor evaluates satisfaction on general aspects of service, e.g. time spent on a question, and satisfaction on quality of response, e.g. completeness, applicability, and the completeness of record in database or file and gives the feedback to the student. The rating of satisfaction are converted to be the score of student. If the satisfaction is not obtained, the student will be asked to re-process.

5. CONCLUSIONS

Competency-based DIS training program composed of 3 modules which covered 7 steps in systematic approach. Each step described the objective, method of training, practice criteria for trainee and evaluation. Module 1 included step 1 (Secure Demographics of Requestor), step 2 (Obtain Background Information) and

step 3 (Determine and Categorize the Ultimate Question). Module 2 comprised of step 4 (Develop strategy and Conduct Search), step 5 (Perform Evaluation, Analysis and Synthesis). Module 3 included step 6 (Formulate and Provide Response) and step 7 (Conduct Follow-Up and Documentation). All of 3 modules were improved by the experts' recommendation. Diagnostic test had been set up to measure level of ability of trainee and to be a guide for focusing on appropriate module.

6. DISCUSSION

The program was arranged into 3 modules, each module has a job- and role-specific. In this study, we used diagnostic test to shorten training time by focusing on the skills which were needed by the trainee need, although some experts did not agree with this idea. About experts' opinion on proposed program, the results showed in means score 3.8, 3.36 and 3.7 out of 5 in module 1, 2 and 3 respectively, which were interpreted as moderate to good level. In module 1, the experts recommended to evaluate step 1 (secure demographics of requestor) by using telephone and the preceptor should participate in a role play and evaluate competency for each student. For step 4 (develop strategy and conduct search) of module 2, experts recommended that preceptor should focus on searching strategy and appropriate drug information resources for 4 question categories, i.e., dosage recommendation, adverse drug reaction, compatibility & stability and pregnancy & lactation. For Step 5 (perform evaluation, analysis and synthesis), the experts suggested that the information available from books or online database (Pubmed, ScienceDirect, etc.) must be always up-to-date. In evaluation part, the experts commended that only observation is not enough to evaluate skills, however, they said that the student presentation should be done to express the idea and skills that the student have. For module 3, the experts suggested that, in step 6 (formulate and provide response), the students should practice to answer questions both in writing and verbal communication. In addition, the preceptor should discuss with

students to get the completed information before answering. And the evaluation in step 7 (conduct follow-up and documentation), the students should inquire the requestor directly about a satisfaction, timeless and application.

The major advantage of competency-based training program set up by modules is that it enables users to adjust and complete the training based on skill deficiency of trainee. This style of training requires more time of preceptor, however, in the real practice, peer tutoring among the students might be used to accomplish the goal.

There was some experts' opinion about using standardized patient in evaluation process. Although standardized patient is a very useful approach to train the students, we did not include this approach to the final program due to limitation on the budget. The future study is of necessary to assess on implementation of this program and its improvement.

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