A Delphi study to curriculum modifying through the application of the course objective and competencies

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ABSTRACT

Background: In order to incorporate new knowledge, skills and emerging concepts from dynamic fields of public health into ongoing courses reform of curriculums sounds necessary. Accordingly, this study was performed to modify health education curriculum of public health undergraduate level. **Materials and Methods:** Using Delphi technique, 18 health education lecturers from Tehran, Tabriz, Yazd, Shiraz, Gonabad, Ghazvin, Avhvaz and Kurdistan Universities Medical of Sciences based on their expertize in health education with PhD degree as scientific members, also 5 heads of departments according to working at health deputy for at least more than 5 years were asked during three rounds through panel experts to suggest and rate topics they deemed most important to graduate public health experts and curricula related to the areas of knowledge and skills in health education course. **Results:** The experts suggested that health enhancing behaviors and reduce health risks, advocate health, behavior change theories and developing a framework are key objects in the curriculum. Much more new topical outlines were related to previous course. Skills rated as important included need assessment and health communication. The most evaluators suggested that adding a practicum unit to two theory units will be helpful. **Conclusion:** The results from our survey suggested that changes in the course definition including new course objectives, topical outlines, and required skills were deemed important by the lecturers and were appropriately integrated into the health education course curriculum. The new curriculum should be evaluated constantly to seek and provide experiences that will best prepare students to meet challenges as a health educator.

Key words: Curriculum modification, health education, public health students

INTRODUCTION

Transition from control of preventable diseases toward chronic and emerging diseases promotes protective behaviors and defines a new approach toward the role of health education in health care system. Based on this new approach, reduced illness, death, and advanced health care could best be achieved through a focus on health promotion and disease prevention.[1] Recommended strategies to improve teaching of public health at undergraduate level[2] along with requirements and challenges facing health education experts show the importance of the health educator responsibility. The role of a health educator is placed on the heart of the new approach.[3] A health educator is who "serves in a variety of roles and is specifically trained to use appropriate educational strategies and methods to facilitate the development of policies, procedures, interventions, and systems conducive to the health of individuals, groups, and communities.[3] National commission health education[4] outlined health educators' seven areas of responsibilities as follows: Planning assessment processes; planning health education; health education implementation; conducting evaluation and research related to health education; administration and managing health

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education; severing as a health education resource person; communication and advocate health education. However, the goal of health education is the transference of understanding into healthy behaviors.

Employers state frequently that new graduates as health education experts often have difficulty adapting to the range of tasks required in their workplace. Medical sciences universities in general and the health schools in particular must define how or what curricula content would be presented within an academic training program to meet the diverse needs of the society. Curricula usually define the learning that is expected to take place during a course or study program in terms of knowledge, skills and attitudes.[5] Health higher education curricula should include mastery of basic skills based on the latest scientific finding, conducting research, planning learning experiences based on sound theories to provide the opportunity of acquirement of information and the skills needed to make quality health decisions.[3] Despite expanded theoretical and experimental behavioral sciences in the context of health promotion programs, in recent years, there have not been renewed efforts to modify health education curriculum in bachelor degree of public health to include applying behavioral sciences or practical communication health skills. Furthermore, no survey was conducted to evaluate inconsistencies in what was being taught in health education course for public health students across the demands of the new approach of health education in workplace. The research team members of the current study who were three health education specialists encouraged conversations among 9 health education specialists known as lecturers and department health education heads from 5 universities to modify, expand, and standardize health education curricula to meet the challenges graduates encounter in future workplace. Health education lecturers also provided feedback from their students who were dissatisfied with the course and had difficulty adjusting with the majority of the health education topics, which were either so impractical in the real world or were duplicated in educational technology course or other courses. Results of the conversations supported the importance of improving curriculum by adding core competencies to health education course. According to the defined areas of responsibilities of health educators and tasks expected from graduates, the current curriculum of health education in undergraduate public health level needs to be modified. The modified curricula should strive to include mastery and procedures provided through courses and research activities in order to help the students to meet the workplace requirements. The goals of revising the curriculum should be consistent with the national education associations' principles[6] such as faculty control, equal access to the qualified education for all students, and multicultural understanding. It also is expected that institutes of public health are set of core competencies that all health educators should possess and has recommended that these be used as an overarching vision for all health care professional education in the 21st century[7] that including: Education; work in interdisciplinary teams;

employ evidence-based practice; apply qualify improvement; utilize informatics. Therefore, this study was performed to modify the public health undergraduate health education curriculum.

MATERIALS AND METHODS

The Delphi technique using objective sampling method was used to explore experts' opinion through panel experts about health education curriculum modification in undergraduate-level of public health. Twenty scientific members from 8 universities and 5 heads of departments from 5 provinces were selected based on their expertize in health education with PhD degree as scientific members or working at health deputy for at least more than 5 years. Thereafter, the experts were invited to participate in this study through an email stating the aim of the study in addition to the current health education curriculum. In total, 18 scientific members from 8 universities and 5 department heads from 5 provinces agreed to participate.

Data collection and analysis

In the first round of this study, each expert was asked to respond to the following questions in short answer form with up to 10 non-similar responses and to express her/his opinion and rational justify if necessary:

What is the health education course description?

What course objectives are essential to support health education course description?

How is the arrangement offering course objectives?

What topical outlines are essential for achieving the course objectives?

What skills and competencies should the students have to meet the requirements of their future workplace?

Panel experts were also asked about the number of units needed to achieve the course objectives, and they were asked if these units should be taught theoretical or as a practicum?

Twenty-three experts answered the questions. To extract and distill group, round 1 suggestion into logical categories and phrase for course description the constant comparative technique[8] was applied. The constant comparative is a method for analyzing data in order to identify a phenomenon, object, event or setting of interest. The validity of the data in this study was supported through reviewing all raw results and categories by at least 3 research team members.

In the second round, participants were provided with the distilled suggestions and were asked to rate the "importance" and "to be suitable" of each on a five-point Likert scale ranging from 1 = unimportant, 2 = somewhat important, 3 = unimportant or not applicable, 4 = important, and 5 = very important and 1 = unsuitable to 5 = very suitable.

According to the results of the second round, in order to elicit consensus on items rated as important, the research team decided to remove the statements with a mean of less than 3.5. In addition, the statements with a standard deviation of greater than 1 were removed, except those with above 55% of distribution of scores or more than 4 or 5 rated values.

In the third round, participants were presented their prior individual rating from round 2 and group mean rating. They were asked if they accepted the first ratings, and if not, to revise their ratings. Descriptive statistics including mean score and standard deviation (SD) were computed to describe the final round. The Statistical Package for the Social Sciences (SPSS) version 16 was used for all statistical analyses.

RESULTS

Course description
After the experts provided their definition of course description the main themes were extracted. Six main concepts based on mean rating for each definition were as follows: Identification of the factors that influence health, concepts of learning and behavior change, development of teaching skills, introductory theories and models of behavior change, identification of the competencies and skills of health educators, current and future issues in health education. The research team arranged these into the following phrase: This course focuses on many factors that influence health and emphasis will be placed on the concepts of learning and behavior change, development of teaching skills for health educator, using appropriate educational strategies and methods in the interventions conducive to the health of individuals, groups, and communities, and current and future issues in health education. The majorities of the experts (89%) assessed the above description very suitable.

Course objectives
In the first round, 83 experts' personal suggestions as the priorities of the course objectives were collected. Then, at the final round of the study, the 37 remained non-identical suggestions with average rating of 3.5 and higher were classified into 16 categories. Some new objects have been included in the suggested curriculum and some were kept the same. Health enhancing behaviors and avoid or reduce health risks, advocate for personal, family and community health, learning and behavior change theories and models, developing a framework or model of change were new objects included in the suggested curriculum. In addition, the object of learning principles was modified by focusing on human learning and behavior modification [Table 1].

Arrangement offering course objectives
After investigating the opinions related the arrangement offering course objects during a term, suggestions rated 3.8 - to 4.9 deemed suitable order. Results are shown in [Table 2].

Topical outlines
More than 182 topical outlines were provided by the experts. These were each categorized in terms of course objectives.

Table 1: Priorities of course objectives with mean rating of more than 3.5 in health education course for undergraduate degree in public health

Course objectives	Mean[a]	No. of suggestions
Introductory on health education	4.9	23
Role of health education in health promotion	4.9	23
Communications in health education	4.9	23
Principles of learning emphasis is on human learning and behavior modification	4.8	23
Apply teaching and learning principles to the development of a teaching project	4.7	21
Relationships among behavioral, environmental factors that affect health	4.7	20
Assessing community needs and recourses	4.6	22
Evaluation of health education programs	4.6	22
Planning in health education	4.6	21
Health education in diverse settings	4.4	20
Health-enhancing behaviors and avoided or reduced health risks	4.2	18
Advocate for personal, family and community health	4.0	19
Learning and behavior change theories and models	4.0	18
Developing a framework or model of change	3.7	16
Research in health education	3.6	18
Future trends in health education	3.5	15

[a]3.5-4.4=Important, ≥4.5=Very important. SD for suggestions ranged from 0.4-0.9

Seventy eight non-similar suggestions remained at the completion of the survey. Besides, the 49 new suggestions were rated from 3.6 to 4.9 as topical outlines to support course objectives. Much more new topical outlines were related to previous course objectives including principles of learning renewed by emphasis on human learning and behavior modification, application of teaching and learning principles in the development of a teaching project, relationships among behavioral and environmental and factors that affect the health, evaluation of health education programs and communications. Remained topical outlines rated very important or important were associated with the new objects including learning and behavior change theories and models, developing a framework, health-enhancing behaviors, avoid or reduce health risks and advocate personal, and family and community health. Results are summarized in Table 3.

Skills and competencies
As it is shown in Table 4, the experts agreed on a variety of experiences essential for public health students to be better prepared. Need assessment process, implementation of a plan of action, as well as plan communication in health education programs were rated as very important skills. Other important ideas included conduct evaluation and research related to the health education, serving as a health education consultant and being engaged in health education advocacy.

Table 2: Arrangement offering course objectives with mean rating of more than 3.5 in health education course for undergraduate degree in public health		
Course objectives	Mean[a]	No. of suggestions
Introductory on health education	4.9	23
Role of health education in health promotion	4.9	23
Principles of learning with emphasis on human learning and behavior modification	4.9	23
Assessing community needs and recourses	4.9	20
Relationships among behavioral and environmental factors that affect the health	4.8	22
Learning and behavior change theories and models	4.8	19
Developing a framework	4.7	21
Planning in health education	4.7	20
Evaluation of health education programs	4.7	19
Communications in health education	4.7	18
Health education in diverse settings	4.6	21
Applying teaching and learning principles to the development of a teaching project	4.6	20
Health-enhancing behaviors and avoided or reduced health risks	4.4	19
Advocate for personal, family and community health	4.3	14
Research in health education	3.8	16
Future trends in health education	3.6	15

[a]3.5-4.4=Important, ≥4.5=Very important. SD for suggestions ranged from 0.4-0.9

Number of units

As application of behavioral theories needs practical implementation, most evaluators (84%) suggested adding a practicum unit to two theory units. Their justification was simplifying the course in the areas of behavioral theories and research in health education.

DISCUSSION

Revision of health education curricula in health schools has not taken place at regular intervals and the changing health needs of the communities and graduates have not been considered.

The current health education course definition has failed to include the defined role definition from ministry of health and medical education, health care, research and educational role. Inconsistency between expert public health role definition and health education course definition stimulated revising the course curriculum. Previous definition aimed to get familiar with the concepts, principles of health education and to acquire planning ability, and to implement and evaluate health education programs. However, revised definition emphasizes on social, economic and environmental conditions influencing the health, individual risk factors and risk behaviors, using educational strategies and methods to facilitate interventions in the health of individuals, groups, and communities.

Table 3: Topical outlines related to course objectives with mean rating of more than 3.5 in health education course for undergraduate degree in public health		
Course objectives	Topical outlines	Mean[a]
Introductory on health education	History, definition, principles, approaches, aim and philosophy of health education[O]	4.8
Role of health education in health promotion	Economic benefits of health education[N]	4.8
	Long term benefits of health education[N]	4.8
	Educational experiences[N]	4.8
	Primary prevention[O]	4.7
	Secondary prevention[O]	4.7
	Tertiary prevention[O]	4.7
	Role of health education in preventing communicable, chronic diseases, family and school health[O]	4.7
Principles of learning, emphasis is on human learning and behavior modification	Behaviorist Theories[N]	4.7
	Cognitive Constructivist[O]	4.7
	Constructivist theories[O]	4.6
	Teaching and learning strategies[O]	4.5
	Learning styles[N]	4.5
	Teaching styles[N]	4.5
Assessing community needs and recourses	Clarifying the purpose of the needs assessment[O]	4.6
	Identifying the population[O]	4.6
	Determining how the needs assessment is being conducted[O]	4.6
	Designing a survey instrument[N]	4.5
	Collecting Data[N]	4.5
	Analyzing Data[N]	4.4
	Using the results[N]	4.4
	Determining short and long term goals[O]	4.4
	Using at least 3 data sources to justify each goal or target area[N]	4.1

Contd...

Table 3: Contd...		
Course objectives	**Topical outlines**	**Mean[a]**
Relationships among behavioral and environmental factors that affect health Learning and behavior change theories and models	Identifying factors that influence health behaviors[O]	4.6
	Analyzing factors that influence health behaviors[N]	4.6
	Identifying factors that enhance or compromise health[N]	4.5
	Analyzing factors that enhance or compromise health[N]	4.5
Learning and behavior change theories and models	Domains of learning[O]	4.5
	Introducing some interpersonal and intrapersonal theories and models to recognize and change behavior[N]	4.3
Developing a framework	Applying a theory or model to determine factors influencing behavior[N]	4.4
Planning in health education	Identifying target group[O]	4.8
	Identifying educational objects[O]	4.8
	Formulating secondary educational objects[O]	4.8
	Content planning[O]	4.7
	Evaluation methods planning[N]	4.7
	Conducting program[O]	4.5
Evaluation of health education programs	Process of evaluation[O]	4.9
	Measurement versus evaluation[N]	4.5
	Measurement instruments[N]	4.4
	levels of program evaluation[N]	4.4
	Evaluation of learner/client[N]	4.3
	Evaluation of the educator[N]	4.0
Communications in health education	Role of communication in health promotion[O]	4.9
	Definition of health communication[O]	4.8
	Health communication cycle[N]	4.7
	Analysis situation communication in health program[N]	4.7
	N Objectives and strategies in health communication program[N]	4.7
	Components of effective health communication[O]	4.7
	mass media channels in an effective health communication[O]	4.6
	Impact of interpersonal communications on behavior[N]	4.5
Health education in diverse settings	Health education in schools[O]	4.8
	Health education in workplace[O]	4.6
	Health education in health care centers[O]	4.6
	Health education in community[O]	4.5
Applying teaching and learning principles to the development of a teaching project	Adult learning theories[O]	4.9
	Assessment of learner[O]	4.8
	Instructional goals[N]	4.7
	Measurable learning objectives[N]	4.7
	Lesson plans[N]	4.7
	Learning styles[N]	4.7
	Contextual factors[N]	4.5
	Teaching strategies[N]	4.5
	Effective teaching aids[N]	4.4
	Evaluation of learning objectives[N]	4.4
	Evaluation of teaching[N]	4.3
Health-enhancing behaviors and avoided or reduced health risks	Analyzing the role of individual responsibility in enhancing health[N]	4.6
	Demonstrating a variety of healthy practices and behaviors that will maintain or improve the health[N]	4.6
	Demonstrating a variety of behaviors that avoid or reduce health risks[N]	4.5
Advocate for personal, family and community health	Promoting healthy norms and healthy behaviors[N]	3.9
	Developing important skills to target health-enhancing messages[N]	3.7
	Encouraging others to adopt healthy behaviors[N]	3.8
	Influencing and supporting others to make positive health choices[N]	3.8
	Advocating for improving personal, family, and community health[N]	3.7
	Adapting health messages and communication techniques to a specific target audience[N]	3.7
	Using accurate peer and societal norms to formulate a health-enhancing message[N]	3.5

Contd...

Table 3: Contd...		
Course objectives	**Topical outlines**	**Mean[a]**
Research in health education	Developing theories and models[N]	3.7
	behavior change to research in health education[N]	3.5
Future trends in health education	Credentialing[N]	3.6
	Certified health education specialist[N]	3.5
	Community and public health[O]	3.5

[a]3.5-4.4=Important, ≥4.5=Very important. SD for suggestions ranged from 0.4-0.9. O=Old topical outline, N=New topical outline

Table 4: Experiences desired in health education course. Skill categories were derived with mean rating based on likert scale of 1=unimportant to 5=very important for these suggestions in round 3		
Skill categories	**Skill suggestion**	**Mean**
Need assessment process	Collecting information about the program	4.6
	Examining relationships among behavioral and environmental and genetic factors that enhance or compromise health	4.6
	Inferring needs for health education based on assessment findings	4.6
	Analyzing a health problem from a behavioral point of view	4.5
	Prioritizing health education needs	4.5
Implementing a plan of action	Assessing readiness for implementation	4.5
	Collecting baseline data	4.4
	Using strategies to ensure cultural competence in implementing health education plans	4.4
	Using a variety of strategies to deliver a plan of action	4.4
	Promoting plan of action	4.3
	Applying theories and models of implementation	4.0
	Launching plan of action	4.0
	Monitoring implementation of health education	3.9
	Modifying plan of action as needed	3.9
	Training individuals involved in implementation of health education	3.9
Planning health education	Involving priority populations and other stakeholders in the planning process	4.5
	Communicate need for health education to priority populations and other stakeholders	4.5
	Obtaining commitments from priority populations and other stakeholders	4.3
	Developing goals and objectives	4.3
	Identifying desired outcomes utilizing the needs assessment results	4.0
	Assessing resources needed to achieve objectives	4.0
	Selecting or designing strategies and interventions	4.0
	Designing theory-based strategies and interventions to achieve stated objectives	3.9
	Applying principles of cultural competence in selecting and designing strategies and interventions	3.9
	Pilot test strategies and interventions	3.8
	Developing a scope and sequence for delivery of health education program	3.8
	Determining the range of health education needed to achieve goals and objectives	3.8
	Developing a process for integrating health education into other programs	3.7
	Addressing factors that affect implementation	3.5
	Identifying factors that foster or hinder implementation	3.5
Communication in health education	Applying health communication cycle to implement, monitor, and evaluate health communication programs	4.8
	Analysis situation and audiences' needs, values, and accessibility	4.5
	Identifying program objectives and strategies	4.3
	Identifying barriers to effective communications	4.2
	Developing and pretesting messages and materials	4.0
	Identifying impact mass media channels in an effective health communication	4.0
	Applying communications, appropriate tools and channels	3.9
	Identifying elements of an effective health communication program	3.9
	Analyzing potential impact of interpersonal communications on behavior	3.7
Conducting evaluation and research related to health education	Developing evaluation/research plan	4.7
	Designing instruments for data collect	4.6
	Collecting and analyzing evaluation/research data	4.5

Contd...

Table 4: Contd...		
Skill categories	**Skill suggestion**	**Mean**
	Interpreting results of the evaluation/research	4.1
	Applying findings from evaluation/research	4.0
Serving as a health education consultant	Serving as a health education consultant	4.6
	Defining parameters of effective consultative relationships	4.5
	Establishing consultative relationships	4.5
	Providing expert assistance	4.4
	Facilitating collaborative efforts to achieve program goals	4.4
	Evaluating the effectiveness of the expert assistance provided	4.3
	Applying ethical principles in consultative relationships	4.0
Being engage in health education advocacy	Engagement of stakeholders in advocacy	3.8
	Complying with organizational policies related to participating in advocacy	3.8
	Communicating the impact of health and health education on organizational and socio-ecological factors	3.7
	Using data to support advocacy messages	3.5
	Implementing advocacy plans	3.5
	Participating in advocacy initiatives	3.5

[a]3.5-4.4=Important, ≥4.5=Very important. SD for suggestions ranged from 0.4-0.9. SD for suggestions ranged from 0.4-1.0

As a course definition contributes to development and definition of course objectives, it was necessary to revise the course objectives.

The panel experts did not completely eliminate the previous objects. Considering importance of introductory on health education, role of health education in health promotion, principles of learning, planning of health education, health communications, assessing community needs and resources, evaluation of health education programs, research in health education and future trends in health education were kept the same. Health education in diverse settings, health-enhancing behaviors and avoided or reduced health risks, advocate personal, family and community health, learning and behavior change theories and models, developing a framework or model of change and application of teaching and learning principles to the development of a teaching project, in addition to the relationships among behavioral and environmental factors affecting health were new objectives.

Because health is affected by a variety of positive and negative factors within the society, the relationship among behavioral and environmental factors was included as a new objective. This object with 76.47% favorability focuses on identifying and understanding the diverse internal and external factors that influence health practices and behaviors including personal values, beliefs, and perceived norms. The justification of 78.3% of expert panel for considering health-enhancing behaviors and avoided or reduced health risk object was the fact that many diseases and injuries can be prevented by reducing harmful and risk-taking behaviors. Therefore, it appears that achieving maintenance healthy behaviors would be facilitated by acceptance of personal responsibility. Personal, family and community health object advocate had a favorability of 82.7%. The main justification in this regard was that advocacy skills help the students to develop important skills to target their health-enhancing messages and to encourage others to adopt healthy behaviors.

According to receive the stakeholders' feedback and in respond to dissatisfaction of them related to weakness of public health experts in conducting health system research and according to the practical implementation of the research in health education, the learning and behavior change theories and models were evaluated favorable by 78.3% of the experts. The survey showed that 4 experts disagreed with including this object, because they believed that this topic was not necessary at the graduate level. Nonetheless, other experts believed that including this topic might develop the students' ability to meet the research expectations and educational role, as well as effectively planning of health interventions. In turn, learning and behavior change theories and models support developing a framework or model of change besides applying teaching and learning principles into a teaching project.

Identifying topical outlines helps the lecturer in designing the framework and avoiding personal topical outlines when covering a course objective. Therefore, the topical outlines were revised to support the course objects. The expert panel reflected their view, as well as students' disinterest and dissatisfaction with some of topical outlines related to course objectives like learning theories, communications models in health education, teaching and learning principles application in the development of a teaching project and research in health education. The most reasons for dissatisfactions were impracticability of communication models in health education, current learning principles and usefulness of health education in research. Health communication cycle, analysis situation communication in health program, objectives and strategies in health communication program, impact of interpersonal communications on behavior were the topical outlines evaluated to be very important or important related communications in health education object. The communication models in health education were removed from the curriculum. Based on the suggestions of the experts, the learning and behavior change theories and models

and application of the teaching and learning principles in the development of a teaching project should be incorporated into the curriculum. It has also been explained that behavioral and social sciences contribute to understanding of the social determinants of health and acquired skills necessary for effective communication and implementation of intervention programs. The majority of experts (78.5%) expressed that this topic would promote students' ability for applying learning principles, research in health education and also will improve positive feeling of useful reflected students' disinterest.

The skill development should be directed to the desired competencies.[2] Many experiences suggested by expert panel focused on need assessment, planned and implemented health education programs besides communication skills. These suggestions rated between 3.5 and 4.6. Need assessment had a largest number of suggestions deemed important including collecting information, relationships among behavioral and environmental factors, inferred needs for health education based on assessment findings, analyzing a health problem from a behavioral point of view and prioritizing health education needs. The total number of skill suggestions deemed important was much higher than course objectives, which may be due to the fact that multiple skills can be gained through a single objective.

There is needed to comply with rational sequences when teaching. Regardless of the curriculum which is developed, the sequence of objectives should be aligned to the outlines what students should know and be able to do throughout their experience. The experts agreed on the following points: Assessment of community needs, the relationships between behavioral and environmental factors affecting the health, learning and behavior change theories, developing a framework, and planning and evaluating health education programs will offer the best sequence. To explain the reason, they stated that familiarity with the relationships among behavioral and environmental factors contributes to better learning and understanding of behavior change theories, and subsequently, it simplifies developing a framework, and planning and evaluating health education programs.

Most evaluators (72.5%) suggested that the units should increase from 2 to 3. The experts explained that learning requires time and effort. Hence, adequate time for skill development is needed. Because student performance should be measured, given the required competencies, considering one practicum unit, in addition to two theory units was suggested. There were 4 experts who believed that students have the opportunity to repeat the learned topics during the training and it is not necessary to increase the number of units.

CONCLUSION

This study provides the first evidence for health education curriculum modification for public health undergraduates based on the expert panel. Assessing the suggestion of study displayed health promote behaviors, advocate health, behavior change theory and models, as well as developing a framework are key objects in the curriculum. Much more new topical outlines were related to previous course. Skills have utility more included need assessment and health communication. The majority of evaluators agreed that adding a practicum unit to two theory units will be useful. Accordingly, changes should be evaluated constantly to cover the challenges graduated encounter at workplace.

AKNOWLEDGEMENT

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