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Development and application of course-embedded assessment system for program outcome evaluation in the Korean nursing education: A pilot study

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SUMMARY

Background: Program outcome evaluation is important because it is an indicator for good quality of education. Course-embedded assessment is one of the program outcome evaluation methods. However, it is rarely used in Korean nursing education.
Objectives: The study purpose was to develop and apply preliminarily a course-embedded assessment system to evaluate one program outcome and to share our experiences.
Design and settings: This was a methodological study to develop and apply the course-embedded assessment system based on the theoretical framework in one nursing program in South Korea.
Data: Scores for 77 students generated from the three practicum courses were used.
Methods: The course-embedded assessment system was developed following the six steps suggested by Han's model as follows. 1) One program outcome in the undergraduate program, "nursing process application ability", was selected and 2) the three clinical practicum courses related to the selected program outcome were identified. 3) Evaluation tools including rubric and items were selected for outcome measurement and 4) performance criterion, the educational goal level for the program, was established. 5) Program outcome was actually evaluated using the rubric and evaluation items in the three practicum courses and 6) the obtained scores were analyzed to identify the achievement rate, which was compared with the performance criterion.
Results: Achievement rates for the selected program outcome in adult, maternity, and pediatric nursing practicum were 98.7%, 100%, and 66.2% in the case report and 100% for all three in the clinical practice, and 100%, 100%, and 87% respectively for the conference. These are considered as satisfactory levels when compared with the performance criterion of "at least 60% or more".
Conclusion: Course-embedded assessment can be used as an effective and economic method to evaluate the program outcome without running an integrative course additionally. Further studies to develop course-embedded assessment systems for other program outcomes in nursing education are needed.

Introduction

As the focus of the education paradigm shifts from educators to learners, interest has increased regarding the running of an outcome-based education program which emphasizes the students' competencies or capabilities rather than mere knowledge of what they were taught (Candela et al., 2006). Accordingly, in the outcome-based education program, it is important to verify the improvement of students' competencies or capabilities that they are expected to achieve at the point of graduation. However, it is difficult to evaluate how much progress the students actually made at the point of finishing the program (Kim, 2012; National League for Nursing, 2004). Thus, to evaluate the students' achievement level for core competencies or capabilities at the time of graduation becomes an important issue in nursing education today.

Although many evaluation methods have been developed to ascertain the students' progress in competencies (Kuh et al., 2014), the consensus about the most appropriate evaluation method has not yet been reached, because program outcomes targeted to be reached are various depending on majors and curriculums. Nevertheless, establishing a good evaluation system including appropriate evaluation methods is always critical because this system can help to evaluate and manage the program outcomes that are the core competencies for students to achieve through the education program, and provide feedback loop for improvement in quality for the education program based on the evaluation results (Weimer, 2013).

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Universities in the US are developing a program outcome (PO) evaluation system and actively sharing their experiences of PO evaluations (Jankowski, 2011). Various PO evaluation systems that are reported via case studies include the important concepts as follows: integrated assessment, fully embedded assessment, connection among courses, and outcome measures. Although the integrative course such as Capstone Project was considered as one of the useful PO assessment methods, this method was unclear as to where the results from Capstone project could be used as feedback and how to apply the results to the curriculum to improve the PO achievement levels. In addition, much effort and time of faculty members are needed to develop and operate the integrative subject as the Capstone project (McKenzie et al., 2004; Gerretson and Golson, 2005; Jin et al., 2010). Considering that the assessment methods have to be manageable with a limited amount of faculty time and provide a feedback loop that can close the gap between assessment and instruction, the course-embedded assessment (CEA) is considered as an adequate method.

The CEA is an education program-centered process that evaluates the PO by using the results naturally produced by the PO-related course without running a separate course for PO evaluation (Gerretson and Golson, 2004), so it is considered as an economically sound method for PO measurement. In addition, the other significant feature of CEA is a backward design approach. In this approach, assessment results of each course for evaluating PO are analyzed and the PO assessment results are fed back to each course directly. Therefore, it was considered as an effective PO assessment method that provides a feedback loop to close the gap between assessment and instruction (Gerretson and Golson, 2004).

In using CEA, educators need to design an evaluation system which includes identification of PO related courses, development of evaluation tools and rubrics, the detailed criteria for grading, to measure each outcome, and provide direct feedback to the program to improve the education quality. Also, CEA is regarded as an economic and useful PO evaluation method as it can make consistent evaluations using the same evaluation tool and criteria for various related courses that share the PO (Gerretson and Golson, 2005). Therefore, use of the CEA should be encouraged as an effective assessment process to provide useful information with a limited amount of faculty time (Gerretson and Golson, 2005). Actually, this approach has already been applied by education institutes in other countries under a number of different titles such as the fully embedded assessment model or All-in-One (Gerretson and Golson, 2005; Jankowski, 2011; Richman and Ariovich, 2013). However, there is little study that applies CEA for evaluating the POs of nursing education in South Korea.

In South Korea, the Korean Accreditation Board of Nursing Education (KABONE) plays a leading role in conducting accreditation for Korean nursing education institutes and in developing the standards for nursing education including the outcome-based education program. Recently, KABONE strongly recommended the outcome-based program operation and the PO evaluation (Korean Accreditation Board of Nursing Education, 2012). Accordingly, several studies regarding the development of outcome-based education programs (Kim, 2012, Song et al., 2015) and evaluation of the PO (Song et al., 2015) have been conducted. However, these are not studies on PO evaluation using CEA. When considering that CEA suggests detail evaluation stages and could be commonly applicable to all education institutes, it would be very useful to develop and apply the CEA system for PO evaluation in outcome-based nursing education. In addition, there is a need to share experience of CEA development and application in Korean nursing education because the CEA has not been applied in the Korean nursing education context yet and understanding about CEA for PO evaluation methods has become more important around the world including Korean education. Therefore, in this study, we try to share our experience including development and application of the CEA system for one nursing program outcome. It could contribute to improving global understanding regarding PO evaluations using CEA in nursing education programs not limited only to Korean context.

Background/Theoretical Framework

Course-embedded assessment can be performed flexibly depending on the education course and assessment type. Several studies provide evidence that analysis using course-embedded data has been performed under different names and formats in diverse institutions (Whitfield, 2003; Gerretson and Golson, 2005; Jankowski, 2011). Among CEA models suggested by researchers (Gerretson and Golson, 2005; Kelly, 2002; Han, 2009), this study adopted on Han (2009)'s CEA model as a theoretical framework after discussion about various CEA models among the professors because it was similar to CEA models suggested by Gerretson and Golson (2005) and Kelly (2002) and commonly used in Korean education context, especially in engineering education programs. Han's model consists of six steps and includes explanation and important considerations for each step.

The first step is to select one PO to apply to CEA. The selected PO should be described as an action verb to assist good communication among professors who are responsible for each course as well as between the professor and students.

The second step is to identify the courses related to the selected PO. The relation matrix, which analyzed the relevance between the selected PO and courses in the education program, is commonly used as a basis for selecting proper courses. The important point in determining the related courses is to select two or more courses with a focus on the senior years and that all students are taking the class, rather than selecting all courses related to the PO in the relation matrix (Yamayee et al., 2005).

The third step is to select the evaluation tools to assess outcomes such as common questions among the courses, written examinations, reports, project presentations, and portfolios. Although various evaluation tools can be used in the selected courses, it is important to use the same rubrics or evaluation items that contain the detail information for grading of student competencies.

The fourth step is to establish the performance criterion, which is the achievement level that the students are expected to reach at the point of finishing course. This criterion is set up in advance by the courses' professors or the education evaluation committee that analyzes the PO achievement level. Achievement level is typically divided into low, middle, and high achievement, and can be described as "at least 60% or more students will achieve at the middle or high level" in the initial stage of evaluation as ground that it is generally at an accepted level (Harmanani, 2010; Kim et al., 2011). In this step, an appropriate cutoff point for low, middle, and high level is decided. Although it is important that the previous performance level of the students would be considered, the cutoff point could be determined after full discussion among the professors of the related courses when there is little information about the students in the program at the early stage of PO evaluation (Song et al., 2015).

The fifth step is to implement the evaluation using the rubrics and evaluation items to measure the PO in the selected courses.

The sixth step is to analyze the evaluation results and provide feedback for continuous quality improvement in the education program. In this step, the obtained scores produced from each course evaluation are analyzed to identify the achievement rate, and then the achievement rate is compared with the established performance criterion in order to determine whether educational goals for the program, i.e., performance criterion has been achieved. Various problems arising from related course operation are identified and strategies to improve the quality of program are developed and fed back to each course.

Methods

Design and Data

This was a methodological study to develop and apply the CEA system based on the conceptual framework suggested by Han (2009) and to evaluate one of the POs for nursing education. According to the six steps of Han's model, in the development steps, one PO for CEA was