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An Evaluation of Integrated Curriculum Based on Students' Perspective

Center for Biomedical Resources at Chonnam National University[1]
Dept. of Medical Education, Chonnam National University Medical School, Gwangju, Korea

Sun A Oh[1], PhD, **Eun Kyung Chung,** MD, **Jung Ae Rhee,** MD, **Yung Hong Baik,** MD

= Abstract =

학생 관점에서 본 통합교육과정 평가

오선아[1]·정은경·이정애·백영홍

전남대학교 의생명인력사업단[1], 전남대학교 의과대학 의학교육학교실

Purpose: For medical students to have a meaningful learning experience, the curriculum must integrate what students are learning in class with the skills and knowledge required in the clinicalsetting. To satisfy these needs, an integrated curriculum (IC) has been operating at Chonnam National University Medical School since 1999. The purpose of this study was to evaluate the changes in IC students during two implementation periods, the first in 2001 and the second in 2004. This study focused on the student viewpointin order to create an authentic IC program.

Methods: Questionnaires were used to evaluate the differences in the student perception of IC. The content of the questionnaire dealt with the appropriateness of time management, coherence of the content, teachinglearning method, and IC evaluation.

Results: There were positive responses from the second implementation period than from the first, for almost all sub-items. However, the results showed that IC has to be reinforced by instructors teaching a coherentcontent, by using a variety of teaching-learning methods, by having the students participate actively, and by offering holistic and integrated assessments.

Conclusion: The following three steps are recommended for the improvement of IC: facilitate an IC committee, develop teaching-learning methods, and guide student participation.

Key Words: Integrated Curriculum, Student Perception

교신저자: 정은경, 전남대학교 의과대학 6층 의학교육학교실, 광주광역시 동구 학1동 5번지
　　　　Tel: 062)220-4178,　Fax: 062)236-3653,　E-mail: ekcmedu@jnu.ac.kr

Introduction

Korean medical education is rapidly changing. One of the general changes is towards reducing the factual load in the curriculum and encouraging students to develop their own learning skills in preparation for continuing personal and professional development. To accomplish these changes, integrated curriculum (IC) has been implemented in medical education. To become meaningful learning for medical students, the curriculum has to integrate what they are learning in college with the knowledge and skills they will use in the clinical environment. IC emphasizes the integration of networked knowledge instead of segmented facts and discrete knowledge. Learners need to know how to learn and how to think in order to construct their own learning strategies (Irby & Wikerson, 2003; Jo, 1997; Kysilka, 1998).

Chonnam National University Medical School (CNUMS) has been operating IC since 1999. The purpose of this study was to review the IC results. Along with previous research on student perceptions, the current study highlights the value of student perception surveys as a part of an institution's quality assurance process. To accomplish this goal we analyzed student responses according to the implementation period: the 1st period (2001) and the 2nd period (2004). To analyze according to the time interval involves reviewing the changes of student perception of CNUMS IC implementation. Unlike previous studies on Korean medical school's IC (Kim et al., 1995; Kim et al., 1997; Lee et al., 2000; Shin et al. 2000), where there has been relatively little investigation of the changes in student opinion over time, we consider the student viewpoint critical for the creation of an authentic IC.

Methods

1. Subjects

The subjects were 114 and 147 third-year medical students in 2001 and 2004, respectively. Of these 261 participants, 257 responses (response rate: 98.6%) were used in the analysis after the exclusion of 4 questionnaires due to incomplete information. Third-year students are pertinent as subjects because they have finished lecture-based basic science, including IC, and have commenced the clinical clerkship.

2. Materials

A short, 3-point, Likert-scale questionnaire was distributed to students to evaluate the differences in student perception of IC according to the implementation period. Students were asked to indicate whether they agreed, disagreed or were neutral with respect to a list of statements.

The survey instrument used in this study was derived from other studies that explored teacher and student perception (Kim et al., 1997; Lee et al., 2000). The original survey was modified to gain pertinent data focused specifically on student perception on IC. The survey was divided into four major categories: appropriateness of time management, coherence of the contents, teaching-learning method, and evaluation.

The subcategories of IC time management were time efficiency resulting from reducing overlapping contents, appropriate time assignment on subjects, proper sequencing of timetables, and suitable class time per week. The subcategories of IC content coherence were instructors' teaching consistency, holistic and integrated understanding, appropriateness of scope and quantity, effective support of the lecture notes, and proper subject sequencing. The subcategories of IC teaching-learning methods were support of various teaching-learning methods, pre-

Table I. Changes in Student Perception of IC Time Management

	2001			2004			χ^2	p
	AG	N	DA	AG	N	DA		
Did time efficiency increase due to reduction of overlapping contents?	27(24.1)	19(17)	66(58.9)	60(41.4)	47(32.4)	38(26.2)	28.161	.000
Was appropriate time assigned for subjects offered?	8(7.1)	37(33)	67(59.8)	33(22.8)	64(44.1)	48(33.1)	21.722	.000
Was the timetable proper sequenced?	26(23.4)	34(30.6)	51(45.9)	43(29.7)	86(59.3)	16(11)	41.217	.000
Was class time per week suitable?	30(27)	18(16.2)	63(56.8)	43(39.7)	81(55.9)	21(14.5)	59.948	.000

AG: Agree, N: Neutral, DA: Disagree.

sentation of specific learning objectives, systematically informed instructional materials, and active student participation. The subcategories of IC evaluation methods were appropriateness of test frequency, necessity of holistic and integrated understanding necessary to solve test items, reflection of learning objectives and contents in test items, and test usefulness for self-study.

The survey sought to answer the following research question: How did student perceptions differ between the 1st and 2nd periods in terms of appropriateness of time management, content coherence, teaching-learning method, and IC evaluation?

The quantitative data were processed by SPSS 12.0 statistics program. Ordinal variables were compared using chi-square test for trends. The Cronbach's alpha for this questionnaire was .81.

Results

1. Changes in student perception on the appropriateness of IC time management

Table I presents the result of changes in student perception on the appropriateness of IC time management. Students were asked whether IC supported time efficiency in reducing overlapping contents. More 2nd period students (41.4%) than 1st

period students (24.1%) agreed (p<.0001). Compared to 1st period students (7.1%), more 2nd period students (22.8%) (p=.000) answered that appropriate time was assigned for IC subjects. In the responses about whether the IC time table sequence was proper, 23.4% and 29.7% agreed and 45.9% and 11% disagreed in 1st and 2nd period students respectively (p=.000). When asked about the suitability of class time per week, 27% and 39.7% agreed in 1st and 2nd period students respectively (p=.000).

2. Changes in student perception on the IC content coherence

Table II shows the changes in student perception regarding IC content coherence. When asked whether the IC instructors' teaching in a subject was consistent, 39.3% and 29% agreed, 18.8% and 45.5% were neutral, and 42% and 25.5% disagreed in 1st and 2nd period students, respectively (p=.000). Students were asked whether IC supported holistic and integrated understanding: 38.4% and 25.5% agreed, 33.9% and 48.3% were neutral, and 27.7% and 26.2% disagreed in 1st and 2nd period students, respectively (p=.039). About the contents scope of the IC subjects, the students' negative response in 2nd period students (28.3%) was decreased compared to 1st period students (78.6%) (p=.000). Regarding the

Table II. Changes in Student Perception on IC Content Coherence

	2001			2004			χ^2	p
	AG	N	DA	AG	N	DA		
Were instructors consistent when teaching a subject?	44(39.3)	21(18.8)	47(42.0)	42(29)	66(45.5)	37(25.5)	20.615	.000
Was holistic and integrated understanding supported?	43(38.4)	38(33.9)	31(27.7)	37(25.5)	70(48.3)	38(26.2)	6.512	.039
Were scope and quantity appropriate?	6(5.4)	18(16.1)	88(78.6)	26(17.9)	78(53.8)	41(28.3)	63.941	.000
Were lecture notes useful?	39(35.1)	27(24.3)	45(40.5)	40(27.6)	63(43.4)	42(29.0)	10.180	.006
Were subjects properly sequenced?	34(30.6)	52(46.8)	25(22.5)	46(31.7)	79(54.5)	20(13.8)	3.466	.177

AG: Agree, N: Neutral, DA: Disagree

Table III. Changes in Student Perception on IC Teaching-learning Methods

	2001			2004			χ^2	p
	AG	N	DA	AG	N	DA		
Were various teaching-learning methods supported?	10(9.0)	19(17.1)	82(73.8)	40(27.6)	68(46.9)	37(25.5)	59.142	.000
Were specific learning objectives presented?	26(23.4)	58(52.3)	27(24.3)	40(27.6)	83(57.2)	22(15.2)	3.458	.177
Were instructional materials systematically informed?	33(29.7)	43(38.7)	35(31.5)	28(19.3)	83(57.2)	34(23.4)	8.762	.013
Was student participation actively encouraged?	10(9.0)	35(31.5)	66(59.5)	122(15.2)	77(53.1)	46(31.7)	19.652	.000

AG: Agree, N: Neutral, DA: Disagree

effective use of the lectures' notes, both the negative responses of 2nd period students (29%) were lower than those of 1st period students (40.5%) (p=.006). There was no significant difference in responses to the sequence of the IC subjects according to implementation period.

3. Changes in student perception on the IC teaching-learning methods

Table III shows the changes in student perception on the IC teaching-learning methods. In regards tothe support of various IC teaching-learning methods,

negative and positive responses were 73.8% and 9.0% for 1st and 25.5% and 27.6% for 2nd period students, respectively (p=000). There was no significant difference according to the implementation period in the responses to whether the faculties presented the specific learning objectives in class. Students were asked whether the instructional materials were systematically presented or not: 29.7%, 38.7%, and 31.5% in 1st period students and 19.3%, 58.7%, and 23.4% in 2nd period students agreed, were neutral, and disagreed, respectively (p=.013). In regards to active student participation, the positive

Table IV. Changes in Student Perception on IC Evaluation Methods

	2001			2004			χ^2	p
	AG	N	DA	AG	N	DA		
Was the frequency of tests appropriate?	39(35.1)	30(27)	42(37.8)	40(27.6)	91(62.8)	14(9.7)	40.972	.000
Was holistic and integrated understanding necessary to solve test items?	32(28.8)	33(29.7)	46(41.4)	51(35.2)	69(47.6)	25(17.2)	19.088	.000
Did test items properly reflect learning objectives and contents?	36(23.4)	48(43.2)	27(24.3)	47(32.5)	86(59.3)	12(8.3)	13.730	.001
Were tests useful for self-study?	31(27.9)	33(29.7)	47(42.3)	53(36.6)	70(48.3)	22(15.2)	24.019	.000

AG: Agree, N: Neutral, DA: Disagree.

response of 2nd period students (15.2%) was higher than that of 1st period students (9.0%). The negative response of 2nd period students (31.7%) was lower than that of 1st period students (59.5%).

4. Changes in student perception on IC evaluation methods

Table IV shows changes in student perception on IC evaluation methods. Regarding the appropriateness of test frequency, the positive response of 2nd period students (27.6%) was lower than that of 1st period students (35.1%) (p=.000). In regards to the necessity of holistic and integrated understanding to solve test items, positive responses were higher for 2nd period students (35.2%) than for 1st period students (28.8%). On the contrary, the negative responses of 2nd period students (17.2%) were lower than those of 1st period students (41.4%) (p=.000). Regarding whether the test items properly reflected the learning objectives and contents, 2nd period students agreed (32.5%), disagreed (8.3%), and were neutral (59.3%), and 1st period students agreed (23.4%), disagreed (24.3%), and were neutral (43.2%) (p=.001). When asked whether the test was helpful for self-study, the positive response increased and the negative response decreased in the 2nd period stu-

dents compared to the 1st period students (p=.000).

Discussion

Based on the decision to accept student opinion on the revision of IC, we compared the differences of student perception according to the implementation period. The study results are as follows.

Firstly, the changes in student perception on the appropriateness of IC time management, 2nd period students had a higher positive response rate than 1st period students on such items as time efficiency resulting from reducing overlapping contents, appropriate time assignment on subjects, proper sequence of timetables, and suitable class time per week. Following the implementation of IC in 1999, CNUMS has tried to adapt the IC system in order to construct the scope and sequence of IC subjects, time assignments, and to share the necessity of IC among faculties. These results can be interpreted as indicating that CNUMS IC infrastructure has been established.

Secondly, regarding the changes in student perception on the IC contents coherence, 2nd period students had a higher positive response rate in appropriateness of the scope and sequence of subjects in IC than 1st period students. However, on the instructors'

teaching consistency, holistic and integrated understanding, and effective support of the lecture notes, 2nd period students showed a less positive response than 1st period students. These results demonstrated the continuing lack of focus on the internal aspects IC such as content consistency and smooth communication among tutors, integrated understanding instead of teaching by rote, and support from the lecture notes to help student self-study.

Thirdly, the changes in student perception on the IC teaching-learning methods showed that 2nd period students had a higher positive response rate in the support of various teaching-learning methods and active student participation than 1st period students. However, there was no significant difference in the presentation of specific learning objectives. Now CNUMS is integrating various teaching-learning skills in IC classes such as case-based-learning, small-group-discussion, and clinical simulation. Rather than merely teaching the students the factual knowledge, opportunities to discuss a particular disease and why it is important will be provided for students. We expect these changes will render a more meaningful learning experience by making connections among discrete knowledge.

Lastly, in terms of changes in student perception on IC evaluation methods, 2nd period students had a higher positive response rate than 1st period students regarding the necessity of holistic and integrated understanding to solve the test items, proper reflection oflearning objectives and contents on test items, test usefulness for self-study, and the necessity of various IC evaluation methods. However, on the frequency of assessments the positive responses of 2nd period students were lower than those of 1st period students, indicating that the IC evaluation must be properly administered to reflect the objectives and contents on tests and also to facilitate student self-study efforts. In future research, we will seek various IC evalua-

tion strategies. Kysilka (1998) pointed out the difficulties of IC evaluation due to the necessity of testing instruments to assess comprehensive problem-solving such as portfolios (Greaves & Gupta, 2003; Shackelford, 1996), self-assessment (Mattheos et al., 2004 Weiss et al., 2005), and peer-evaluation (Norcini, 2003).

Along with previous research on student perception, the current study results describe the real IC situation while remaining consistent with those of previous research (Kim et al., 1997; Lee et al., 2000; Shin et al., 2000). These findings confirm the need for further tasks to improve IC in Korea. It is time to reconsider each medical school's IC system. The relatively short period of implementation in the present case may not have allowed a complete change to be made, but somewhat positive changes were demonstrated in terms of time management, contents, teaching-learning method, and assessment. Careful consideration should be given when making generalization from this study due to the fact that the results of this survey come from just only one Korean medical school's case.

We now make the following suggestions for the improvement of IC:

First, the IC committee should be more activated than now to maintain the content coherence among the tutors in each IC subject. Tutors have to communicate and reach a consensus on content selection, teaching-learning methods, and assessment.

Therefore, CNUMS encourages a periodic IC committee meeting to be held before and after the IC class. CNUMS has supported various incentives for IC participants such as giving a conference fee, providing money for research to well-organized IC subjects based on evaluation, and CNUMS is going to invest an IC modulator with a position as head professor.

Secondly, various teaching-learning methods should

be developed in IC. As the curriculum changes learning objectives, teaching-learning methods, assessment, and students' and teacher's roles have to change as well. CNUMS has implemented team-based learning (TBL), problem-based learning (PBL), simulation lab, objective structured clinical examinations (OSCE), and clinical performance examination (CPX). CNUMS has to continuously try to integrate these teaching-learning methods into IC classes.

Lastly, it is vital to guide the students regarding the roles of teacher and learner and the most effective method of participation in IC. Through such an orientation program, students will retain the concepts that instruction must be student-centered and students have to take responsibility for actively managing their own learning. Therefore, instructors have to provide opportunities for students to develop their own learning through small group discussions and team-based activities, and also implement self-assessment and peer-evaluation in the learning process. For authentic learning, the learning responsibility should be shared between teachers and students.

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