

Teaching and Learning in the **Health Sciences**

Erl yn A. Sana
Editor



TEACHING AND LEARNING
IN THE HEALTH SCIENCES

TEACHING AND LEARNING IN THE HEALTH SCIENCES

Erlyn A. Sana

EDITOR

Erlyn A. Sana

Melflor A. Atienza

Lupe F. Abarquez

Nemuel S. Fajutagana

Armando C. Crisostomo

Maria Cecilia D. Alinea

Jose Alvin P. Mojica

Teresita C. Mendoza

Nomar M. Alviar

Angeles Tan-Alora

CONTRIBUTING AUTHORS



THE UNIVERSITY OF THE PHILIPPINES
DILIMAN, QUEZON CITY

THE UNIVERSITY OF THE PHILIPPINES PRESS
E. de los Santos St., UP Campus, Diliman, Quezon City 1101
Tel. Nos.: 9282558, 9253243
E-mail: press@up.edu.ph

© 2010 by Erlyn A. Sana

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, and/or otherwise, without the prior permission of the authors and the publisher.

The National Library of the Philippines CIP Data

Recommended entry:

Teaching and learning in the health sciences/
Erlyn A. Sana, editor.—Quezon City:
The University of the Philippines Press, c2010.
p.; cm.

1. Medical education. 2. Medical sciences.
3. Health education. I. Sana, Erlyn A.

R834 610.711 2010 P102010503

ISBN: 978-971-542-573-5

Book Design: Nicole Victoria

Printed in the Philippines by EC-tec Commercial

TABLE OF CONTENTS

List of Figures	vii
List of Tables	ix
Foreword	xiii
Preface	xvii
<i>Part 1. Teaching and Learning in the Health Sciences</i>	1
Chapter 1. Teaching and Learning in Health Sciences Education · Erlyn A. Sana	3
Chapter 2. Knowledge and the Cognitive Domain of Learning · Melflor A. Atienza	11
Chapter 3. Attitudes, Values, and the Affective Domain of Learning · Erlyn A. Sana	30
Chapter 4. Skills and the Psychomotor Domain of Learning · Melflor A. Sana	49
Chapter 5. The Lesson Plan · Lupe F. Abarquez	67
<i>Part 2. Enhancing the Competence of Teachers in the Health Professions</i>	93
Chapter 6. Basic Delivery Skills · Melflor A. Atienza and Erlyn A. Sana	96
Chapter 7. Strategies in Teaching Small Groups · Maria Cecilia D. Alinea	107
Chapter 8. Strategies in Teaching Large Groups · Melflor A. Atienza	129
Chapter 9. Clinical Teaching Strategies · Melflor A. Atienza	140
Chapter 10. Individualized Instruction · Erlyn A. Sana	161
Chapter 11. Instructional Media · Nomar M. Alviar	173
Chapter 12. Evaluation in Health Science Education · Erlyn A. Sana	182
Chapter 13. Test Construction and Analysis · Armando C. Crisostomo	203
<i>Part 3. Addressing Contemporary Issues in Health Professions Education</i>	235
Chapter 14. Curriculum Planning and Development · Lupe F. Abarquez	238
Chapter 15. Problem-Based Learning · Nemuel S. Fajutagana	274
Chapter 16. Community-oriented Health Science Education Teresita C. Mendoza	286

Chapter 17. The Learner in the Health Science School: Selection of Students Jose Alvin P. Mojica	300
Chapter 18. Evaluation of Teachers in the Health Professions · Erlyn A. Sana	312
Chapter 19. Research in Health Professions Education	
Unit 1. Development of a Research Problem · Erlyn A. Sana	333
Unit 2. Research Methodology · Melflor A. Atienza and Erlyn A. Sana	352
Unit 3. Analysis of Data · Melflor A. Atienza and Erlyn A. Sana	390
Chapter 20. Part I. The Health Professions Teacher as Manager and Administrator · Nemuel S. Fajutagana	414
Part II. Reflections on the Physician as Educator · Angeles Tan-Alora	426
About the Editor/Contributors	461

Chapter 17. The Learner in the Health Science School: Selection of Students Jose Alvin P. Mojica	300
Chapter 18. Evaluation of Teachers in the Health Professions · Erlyn A. Sana	312
Chapter 19. Research in Health Professions Education	
Unit 1. Development of a Research Problem · Erlyn A. Sana	333
Unit 2. Research Methodology · Melflor A. Atienza and Erlyn A. Sana	352
Unit 3. Analysis of Data · Melflor A. Atienza and Erlyn A. Sana	390
Chapter 20. Part I. The Health Professions Teacher as Manager and Administrator · Nemuel S. Fajutagana	414
Part II. Reflections on the Physician as Educator · Angeles Tan-Alora	426
About the Editor/Contributors	461

<i>Figure 11-1.</i> Shannon-Weaver communication model	174
<i>Figure 11-2.</i> Expanded Shannon-Weaver communication model	174
<i>Figure 11-3.</i> Interaction between audiovisual media and the learner	175
<i>Figure 13-1.</i> Anatomy of a multiple choice question	212
<i>Figure 14-1.</i> Elements of a curriculum	240
<i>Figure 14-2.</i> Curriculum-instruction continuum	241
<i>Figure 14-3.</i> Elements of instructional design	241
<i>Figure 14-4.</i> Contexts in the practice of the health professions	242
<i>Figure 14-5.</i> Context of considerations in curricular needs assessment	245
<i>Figure 14-6.</i> Continuum of competencies	252
<i>Figure 14-7.</i> Competency-based approach to formulating curricular and level objectives: An illustration from the BSN curriculum	253
<i>Figure 14-8.</i> SPICES model	254
<i>Figure 14-9.</i> Building blocks design	257
<i>Figure 14-10.</i> Branching design	257
<i>Figure 14-11.</i> Spiral design	257
<i>Figure 14-12.</i> Specific tasks or skills design	258
<i>Figure 14-13.</i> Process-pattern design	258
<i>Figure 14-14.</i> Horizontal integration: An example from the UPCM curriculum	259
<i>Figure 14-15.</i> Vertical integration: An example from the UPCM integrated curriculum	259
<i>Figure 14-16.</i> Integrated course: An example from the UPCM integrated curriculum	259
<i>Figure 14-17.</i> The spiral curriculum	260
<i>Figure 14-18.</i> Spiral curriculum showing multiple organizing strands	261
<i>Figure 14-19.</i> Nursing curriculum framework: An example of curricular organization	262
<i>Figure 15-1.</i> Example of system integration (Respiratory)	276
<i>Figure 16-1.</i> The stepladder curriculum of the School of Health Sciences	291
<i>Figure 17-1.</i> Factors affecting student selection	301
<i>Figure 19-1.</i> The research milieu of health professions education	336
<i>Figure 19-2.</i> Sample conceptual model	345
<i>Figure 19-3.</i> Various dimensions of observation	383
<i>Figure 19-4.</i> Opening menu of Microsoft Excel	393
<i>Figure 19-5.</i> OBAS as a learning environment	410
<i>Figure 19-6.</i> Axis of the concept map of the standard of performance	412
<i>Figure 19-7.</i> Axis of the concept of dependence of interns on their peers	413
<i>Figure 20-1.</i> Steps involved in the planning process	418
<i>Figure 20-2.</i> Fishbone template	420
<i>Figure 20-3.</i> Sample fishbone analysis of a school problem	421
<i>Figure 20-4.</i> Statement of goals and objectives according to the level of implementation	423
<i>Figure 20-5.</i> From force field analysis to formulating strategic objectives	426

LIST OF FIGURES

<i>Figure 1-1.</i> The processes of learning	4
<i>Figure 1-2.</i> Food chain in Ward X: By order of harassment	6
<i>Figure 1-3.</i> Information processing theory of learning	7
<i>Figure 3-1.</i> Schematic diagram of attitudes	32
<i>Figure 3-2.</i> Continuum of indicators used to observe attitudes	33
<i>Figure 3-3.</i> Taxonomy of the affective domain of learning (Including the common indicators used)	35
<i>Figure 3-4.</i> Sample terminal attitudinal objectives on thoroughness	39
<i>Figure 3-5.</i> Continuum of strategies in teaching attitudes	41
<i>Figure 5-1.</i> Elements and steps of instructional design	68
<i>Figure 5-2.</i> Distinction between curricular and learning objectives	70
<i>Figure 5-3.</i> Clinical reasoning process for physical therapists	73
<i>Figure 5-4.</i> Dietary considerations for clients with renal calculi	73
<i>Figure 5-5.</i> Genito-urinary system	74
<i>Figure 5-6.</i> Principles of cancer management	75
<i>Figure 5-7.</i> Processes of learning and instructional purposes	76
<i>Figure 5-8.</i> Factors affecting the degree of instructional support	80
<i>Figure 5-9.</i> Assessment of student learning	82
<i>Figure 7-1.</i> Group dynamics in buzz groups	116
<i>Figure 7-2.</i> Crossover groups—Regrouping of original ABCD groups into another set of groups of similar letters	117
<i>Figure 7-3.</i> Group dynamics in snowballing	118
<i>Figure 7-4.</i> Fishbowl setup	119
<i>Figure 7-5.</i> Group dynamics in roundtable discussions	120
<i>Figure 7-6.</i> Circulating questioning	120
<i>Figure 9-1.</i> Experience cycle of the clinical learning cycle	150
<i>Figure 9-2.</i> Explanation cycle of the clinical learning cycle	156
<i>Figure 10-1.</i> Blending of teacher authority and student autonomy as bases in choosing teaching-learning strategies	163

LIST OF TABLES

<i>Table 1-1.</i> The activities of teaching	8
<i>Table 2-1.</i> Major types of the knowledge dimension, their definitions, and examples	15
<i>Table 2-2.</i> Cognitive processes, their definitions, and examples	15
<i>Table 2-3.</i> Knowledge and cognitive process dimensions	16
<i>Table 2-4.</i> Instructional events in teaching conceptual knowledge	21
<i>Table 2-5.</i> Instructional events in teaching procedural knowledge	26
<i>Table 3-1.</i> Sample attitude indicators showing the value of compassion to patients according to the taxonomy of the affective domain of learning	38
<i>Table 3-2.</i> Sample terminal objectives on thoroughness according to the taxonomy of the affective domain of learning	40
<i>Table 3-3.</i> Values clarification strategies	43
<i>Table 3-4.</i> Final exercise	44
<i>Table 4-1.</i> Competencies and objectives for the psychomotor domain	55
<i>Table 4-2.</i> Instructional events in teaching psychomotor skills	59
<i>Table 4-3.</i> Threshold procedure number for various endoscopic procedures and the required number by the different professional societies	63
<i>Table 4-4.</i> The different levels of the three domains of learning	64
<i>Table 5-1.</i> Comparative table of the organization of content in a nursing curriculum and a nursing course	72
<i>Table 5-2.</i> Assumptions and learning principles in adult learning	76
<i>Table 5-3.</i> Instructional functions and their corresponding activities	81
<i>Table 6-1.</i> Types of questions and questioning techniques	104
<i>Table 7-1.</i> Roles of a facilitator in a small group learning setting	111
<i>Table 7-2.</i> Task and maintenance roles of group members	111
<i>Table 7-3.</i> Stages of group formation and their corresponding content and processes	113
<i>Table 7-4.</i> Suggested way of quantitatively assessing the performance of students in a small group setting	123
<i>Table 8-1.</i> Topics for the basic DOTS workshop and the corresponding learning process involved	136

<i>Table 9-1.</i> Learning processes, instructional events, teaching skills, and clinical microskills	148
<i>Table 10-1.</i> Sample objective and subject matter for RLE of second year nursing students	162
<i>Table 10-2.</i> Continuum of individualized instruction strategies	164
<i>Table 10-3.</i> Sample outputs of students in a self-discovery learning class	165
<i>Table 11-1.</i> Expanded events of instruction	176
<i>Table 12-1.</i> Comparison between educational evaluation and research	185
<i>Table 12-2.</i> Differences between formative and summative evaluations	187
<i>Table 12-3.</i> Sample monitoring evaluation matrix of the integration of TB-DOTS in Philippine medical curricula	193
<i>Table 12-4.</i> Focus, management decisions, and objectives of the CIPP evaluation model	195
<i>Table 12-5.</i> Excerpts from the matrix of the CIPP evaluation model of the MSCE	196
<i>Table 12-6.</i> Learning outcomes and how they can be assessed	198
<i>Table 12-7.</i> Common approaches in assessing attitudes as learning outcomes	198
<i>Table 13-1.</i> Example of a two-way table of a test blueprint for the certifying examination in colon and rectal surgery	208
<i>Table 13-2.</i> Comparison of norm-reference and criterion-reference systems of grading	228
<i>Table 13-3.</i> Relevance, difficulty, and expected success on test items	229
<i>Table 13-4.</i> Example of determining the MPL using Ebel's method	230
<i>Table 14-1.</i> Breakdown of sample responsibilities and tasks	249
<i>Table 14-2.</i> Example of breakdown, from tasks to knowledge	250
<i>Table 14-3.</i> Example of condition, performance, and responsibilities	250
<i>Table 14-4.</i> Differences between professional and student competencies	250
<i>Table 14-5.</i> Example of identifying and categorizing curricular problems	254
<i>Table 14-6.</i> Basic science matrix of the competency-based curriculum of Brown University School of Medicine	256
<i>Table 14-7.</i> Clinical medicine matrix of the competency-based curriculum of Brown University School of Medicine	256
<i>Table 14-8.</i> Eleven steps or stages in the multi-professional education continuum	269
<i>Table 15-1.</i> First year: System integration: Six weeks per module	280
<i>Table 15-2.</i> Synthesis of the seven-jump, instructional events, and cognitive effects	281
<i>Table 16-1.</i> Approaches to medical care and the roles of health personnel	288
<i>Table 16-2.</i> Organization of field attachments by year of study at the University of Zimbabwe	294
<i>Table 17-1.</i> Characteristics of cognitive and noncognitive selection tools	305
<i>Table 18-1.</i> Principles of adult learning and their implications on instructional designing in the health professions	315
<i>Table 18-2.</i> General purposes of teacher evaluation	318
<i>Table 18-3.</i> Faculty career stages and their characteristics	319
<i>Table 18-4.</i> Basic expectations in teachers and types of data needed as instructional designers	320
<i>Table 18-5.</i> Basic expectations in teachers and types of data needed in classroom management	321

<i>Table 18-6.</i> Basic expectations in teachers and types of data needed in doing the role of assessor of student achievement	322
<i>Table 18-7.</i> Basic expectations in teachers and types of data needed in doing the role of researcher	322
<i>Table 18-8.</i> Basic expectations in teachers and types of data needed in evaluating the roles of clinicians and extension workers	323
<i>Table 18-9.</i> Sources of information and types of information that can be used in teacher evaluation	325
<i>Table 18-10.</i> Sample teacher evaluation matrix	327
<i>Table 19-1.</i> Sample of transformation of concepts into constructs based on the study “The social reproduction of the medical profession: The case of the University of the Philippines-Philippine General Hospital Medical Center”	342
<i>Table 19-2.</i> Common theories cited in researches in HPED	343
<i>Table 19-3.</i> Sample conceptual literature on selected educational theories	343
<i>Table 19-4.</i> Sample of theoretical literature reviewed in the study “The social reproduction of the medical profession: The case of the University of the Philippines-Philippine General Hospital Medical Center”	345
<i>Table 19-5.</i> Summary of types of data and scales of measurement	347
<i>Table 19-6.</i> Comparisons between quantitative and qualitative studies	354
<i>Table 19-7.</i> Experimental designs	361
<i>Table 19-8.</i> Recommended sample size for different research designs	378
<i>Table 19-9.</i> Matrix of research methodologies, data collection procedures, and instruments	382
<i>Table 19-10.</i> Summary of data collection instruments, their uses, and sample tools	383
<i>Table 19-11.</i> Common response formats in a closed-response questionnaire	385
<i>Table 19-12.</i> Sample data entry	394
<i>Table 19-13.</i> Dummy frequency distribution of respondents according to year levels (n=149)	395
<i>Table 19-14.</i> Variances and standard deviations in the sample distribution of scores	397
<i>Table 19-15.</i> Mean scores of respondents according to type of student and instructional method used	399
<i>Table 19-16.</i> Mean scores of respondents according to year level and instructional method used	399
<i>Table 19-17.</i> Commonly used parametric tests	400
<i>Table 19-18.</i> Observed frequencies of students’ preferred instructional method	403
<i>Table 19-19.</i> Perceived degrees of preparedness and importance of graduates	403
<i>Table 19-20.</i> Number of students who passed and failed	404
<i>Table 19-21.</i> Three groups of subjects in four conditions	405
<i>Table 19-22.</i> Commonly used nonparametric tests	406
<i>Table 20-1.</i> Management functions in the context of giving lectures	417
<i>Table 20-2.</i> A sample problem prioritization matrix for factors causing poor job satisfaction	422
<i>Table 20-3.</i> Sample force field analysis	425
<i>Table 20-4.</i> Program planning vs. instructional planning	427