

## Design of PBL cases in bioethical education spanning across general and professional education

Hsin-Chen Hsin,<sup>1,2</sup> Chih-Jaan Tai,<sup>3,5</sup> Hsi-Chin Wu<sup>4,6</sup>

“Bioethics” is a study of how to face and handle difficulties and dilemma in “life-related issues”. Bioethics education is featured as a multidisciplinary learning in three aspects, including **P**opulation, **B**ehaviors and **L**ife sciences (collectively abbreviated as PBL, similar to problem-based learning as used in this study), those should also be essential learning contents for students in health-care professions. Problem-based learning (PBL) pioneered more than 40 years ago by McMaster University in Canada has proven to be effective in achieving the learning objectives in population, behaviors and life sciences; however PBL may be more successful if the trigger case scenarios are of high quality which can stimulate more interactive and self-directed learning amongst students.

A three-level ethical course was proposed at China Medical University to approach gradational learning objectives of a bioethics curriculum. These three levels included; “Life and ethics”, “Biomedical ethics” and “Clinical ethics”. The diverse aims in each level imply the need for multiplicity in case scenarios representing a wide spectrum of ethical issues, such as, cases on the topic of animal right, genetically modified food, stem cell research on human, gene privacy, etc. Cases for the fundamental level were specifically designed to help cultivate an attitude for the respect of life, considering risk vs. benefit, and understanding better in life diversity. For the next level, cases are designed to cultivate the ability of moral reasoning and to realize values in medical profession. These cases include truth telling about end-of-life issues, doctor’s duties/right, patient’s self determination and research ethics. The ultimate level utilized a narrative approach to several clinical cases based on patient and family’s story in order to bring ethical consideration in the clinical setting for professional learning. In general, those cases have been designed to stage effective learning from general to professional learning perspectives.

To create effective PBL cases for bioethics learning, the scenarios should lead students to a particular area of study to achieve those diverse learning objects. Ethical problems should not only be appropriate to the level of the students’ understanding but also need to infuse sufficient intrinsic interest for students. Scenario should help stimulate discussion and promote self-directed approach in information acquisition from various learning resources. In general, PBL cases consist of ethical enquiries is commonly derived from dilemmas occurring in everyday life, and then evolved into more specific issues relevant to the context in professional practice.

**Key words: bioethics; Problem Based Learning; PBL case design; general education; professional education.**

**( J Med Education 2011; 15: 281~288 )**

<sup>1</sup> School of Nursing, College of Health Care, China Medical University; <sup>2</sup> Center for Faculty Development, China Medical University; <sup>3</sup> Department of Health Services Administration, China Medical University; <sup>4</sup> School of Medicine, China Medical University; <sup>5</sup> Department of Otolaryngology, China Medical University Hospital; <sup>6</sup> Department of Medical Quality, China Medical University Hospital.

Received: 27 July 2011; Accepted: 18 August 2011.

Correspondence to: Hsin-Chen Hsin, Center for Faculty Development School of Nursing & School of Medicine, China Medical University, No. 91 Hsue-Shih Rd., Taichung 404, Taiwan.

E-mail: hchsin@mail.cmu.edu.tw

This communication represents an invited lecture delivered by the first author in the Joint Asia Pacific PBL Conference held in Taipei in October, 2010. Dr. H.C. Hsin does research and teaching on bioethics, an expert and consultant on medical ethics in affiliated hospitals and the Vice-Director of the Center for Faculty Development at China Medical University, Taichung, Taiwan.

## INTRODUCTION

Recently in Taiwan, teaching ethics within the health care profession has become an important task for medical society<sup>[1,2]</sup>. And yet, the traditional didactic approach in teaching ethics characterized by lecturing in large class faced considerable challenge due to its lack of effectiveness<sup>[3-6]</sup>. The traditional model in ethics education included didactic lectures, teacher-centered, theory or principle-based and single, separate course have been replaced by modern strategies, such as small group discussions; student-centered, case-based learning and integrated modules<sup>[7-9]</sup>. Those strategies adhered to the principle philosophy of problem based-learning (PBL), and were adopted by many medical schools or universities<sup>[10-12]</sup>. “Bioethics” is a study of how to face and handle difficulties and dilemma in “life-related issues”, which generally include ethical questions arise in the relationships among life science, biotechnology and medicine. Bioethics education is featured in its multidisciplinary learning in three aspects; population (significance to society), behaviors (relevance to humanity) and Life science (biomedical knowledge), those are also learning contents for students in medical university. In applying bioethics education at the level of medical school education, we intend not only to cultivate the attitude of learning ethics and to practice life-related ethical knowing to

everyday living, but more importantly, we need to empower students to integrate the know-how on all the above three aspects. PBL may enable adult students to integrate various domains of acquired knowledge and to enhance learning in real-life professional context. PBL has proven to be effective in achieving these learning objectives; however PBL may be more successful if the trigger case scenarios are of high quality.

Ideally, ethics education should be longitudinal, starting in the very early year of college and continuing through the years of medical education and professional career. In addition, incremental aims should be set for advancing levels of ethical learning. In China Medical University, Taiwan, a revised curriculum with three-leveled ethical course was proposed to stage incremental learning objectives of bioethics. A variety of learning cases were designed along with the learning path of students as they move from general to professional education. In this communication, we share our experience in the design of bioethical PBL cases spanning across different stages of medical education.

## PBL IN CURRICULUM DESIGN

Three-leveled ethical course was proposed to approach gradational learning objectives of bioethics. These included; “Life and ethics”, “Biomedical ethics” and “Clinical ethics”, which span from the first 2 years of general education, to the senior years of clinical practice.

For the first level, dealing with the issues in “Life and Ethics”, an elective course in general education was designed for students in their first and second year, with an aim to cultivate an attitude to respect life, consider risk vs. benefit, and understand better in diversity. Beside formal lectures, a variety of teaching methods was used

to trigger discussions on ethics issues relative to life, for example small group discussions on written scenarios using 3-5 PBL trigger problems; each takes 2 sessions with 4-6 hours discussion period. At the second level, "Biomedical Ethics" is a core curriculum for the fourth years' medical students, which was designed to cultivate the ability of moral reasoning and to realize values in medical profession. The combination of large group lectures and small group discussion allowing the materials of presentation (ethical principles and theories) trigger small group discussion. Two PBL cases were selected to offer real-life scenarios containing ethical issues which the aim to stimulate moral sensitivity in medical aspects and to practice moral reasoning in decision making. "Clinical Ethics", represents the third level course which is accompanied by students' clinical learning during the fifth year. This is designed with a major task to enforce students to bring ethical consideration in their clinical learning. Discussion groups were led by clinicians chosen from different clinical disciplines. These clinicians have been trained to be a PBL tutors for student groups, and at the same time they also functioned as a discussion leader of ethics conference in their departments. The strategy of having clinicians involve ethics teaching has improved vertical integration of clinical and preclinical training in ethics. At this stage, a narrative approach to patient and family's story and several clinical real cases were presented in order to bring ethical consideration in their clinical learning.

Instructions of these three courses included a mixture of teaching methods. A small number of initial lectures were delivered mainly to introduce and provide overviews of the course, then the students participated in a variety of activities, the main one being small group discussion using PBL cases as trigger to induce learning in ethics.

## THE BIOETHICAL PBL CASES

Learning ethics through PBL is successful only if the case scenarios are of high quality. The problem should be appropriate to the stage of curriculum and the level of the students' ethical learning. And the case problem should lead students to a particular area of study to achieve each level's objectives of ethics learning which the faculty identified in advance.

For example, animal right, genetic modified food, stem-cell experiments, organ donation, genetics privacy and designed baby were selected to give a general view of "life-related issues" for the first level of ethics pertaining to the learning of "Life and Ethics". Scenarios of relative problems should be consistent with the first level's learning objects to achieve the aim of increase respect for life, balance benefit vs. risk of science and technology and understand better in diversity (Table 1). For the second level, learning of "Biomedical Ethics", contents of communication and disclosure bad news, end-of life issues, doctor's rights and duties, patient's right and self determination and research ethics were included to focus on ethical issues relative to health care profession. Several problems were designed to achieve aim of second level's learning, ie, develop ability in ethical reasoning and clarify values in medical professionalism (Table 1). The third level, learning of "Clinical Ethics", several real cases problem of clinics were designed to include amount of clinical ethics topics such as, informed consents, truth telling, capacity and voluntariness, substitute decision-making, disclosure of malpractice, advance care planning, resource allocation, confidentiality, conflict of interest, medical futility and children's autonomy. Besides, a narrative approach to patient and family'

**Table 1.** Three-level PBL cases

First level PBL cases		
1	Animal rights	“What are those animals for anyways?”
2	Genetic modified food	“Does genetically modified food make you uneasy?”
3	Stem cell application	“Will the paralyzed superman rise again?”
4	Organ donation	“I will do all I can to keep my daughter alive....”
5	Genetic privacy	“I do have the right to not to know, don’t I?”
6	Designed baby	“Is it for treatment or enhancement?”
Second level PBL cases		
1	Telling bad news in terminal cancer	“To tell or not to tell her, what a dilemma...”
2	Natural death/Euthanasia	“The Sweet Death of Pope John Paul II”
3	Duty and right of a doctor	“A doctor with AIDs”
4	Patient’s self determination	“To live or to die, should doctor just leave it to the patient to decide?”
5	Research ethics	“Will I slim my figure by joining the trial?”
Third level PBL cases		
1	Real cases in clinics (with 12 ethical topics; informed consents, truth telling, patient’s capacity, voluntariness, substitute decision-making, disclosure of malpractice, advance care planning, resource allocation, confidentiality, conflict of interest, medical futility and children’s autonomy)	
2	Narratives ethics case (patient and family’s story in ICU)	

s story was involved to improve ethical sensibility in clinic work. In general, those case problems for the three-level learning of ethics have been designed in line with students’ educational path as they move from general to professional education.

The following represents a number of brief summaries of the sample case stories used in three different levels, only the case essence, but the entire case story is presented for brevity:

A sample case for the **first level case-A** genetic privacy case:

**I do have the right not to know, don’t I?**

*A man is susceptible to inherit a Genetic disease of SCA, a late-onset disorder. His wife, from Indonesia, got to know the situation from his family history just after they got married. To decide having children or not, the wife insist that*

*her husband to have a predictive test. He refused; “I would rather die if I know the result is positive.”...However, a positive result of Prenatal testing had disclosed that he had inherited the disease...*

**Issues for discussion**

Benefit and risk of testing at-risk adult, rights and responsibilities of a man with genetic defect, genetic discrimination (such as reproduction, marriage, employment and educational...) are the learning objects embedded within the scenario. While, some other learning objectives related to general concept of bioethics and human life might be raised by students, such as issue of abortion (law of 72-hour cooling period), gender equity, feminism and domestic issues on “foreign spouse”. Those aspects are important contemporary social

issues relevant to life value, life education and social order.

A sample story in brief for the **second level case-A** truth telling cases:

**To tell or not to tell her, what a dilemma...**

*Shelly's mother-in-law (73yr), was diagnosed with lung cancer in stage IV. She then passed away within a year without being told the truth about her illness. Shelly's family felt relieved that their mother did not experienced too much shock. Three years later, Shelly fell sick and was diagnosed to have stomach cancer in its late stage. Her husband withheld the bad news, and Shelly did not make inquiry either, and kept the worry to herself.*

*One afternoon, a visiting consultation doctor who Shelly never met, unintentionally disclosed her cancer progression by he telling her: ".....owing to the late stage of cancerous disease and the type of cancer cell, we do not suggest chemotherapy and a radical surgery would also not be helpful at this time.....we are sorry that no much we can do to help....."*

*That night, Shelly recalled her mother-in-law's death...it was an easy one, as she never knew about it. Now that she has been officially pronounced a death verdict, she cannot bear to think about the pains that are to follow: her three children, who are still very young and her husband, who has always been working very hard for the family...but what would become her family's future? She wonders in tears...she finally seemed to come to a certain realization....the night remains dark and still, Shelly's body plunging to the street down below her ward window broke the silence of the lonely night.*

**Contents of learning self-directed by students**

Pros and cons in telling the truth (or bad news) in medical communication, doctor's legal duty of disclosure, culture effects and prevalence of dying awareness, communication skills and being empathy and stages of emotion to face death (as postulate by Küber-Ross) were set to be the learning objectives of this case. Those objectives may be formulated either through student's self-directed discussion or via guided questions. Students have shown their intrinsic interests in a broader spectrum of life and death issues such as suicide, patient's right to know, end-of-life quality, palliative medicine and hospice care. We may conclude that scenarios of the second level cases have successfully leaded students into a thinking of biomedical ethics in health-care profession.

A sample story in brief for the **third level case-Narratives** of end-of-life issues in ICU:

**A story based on a patient and his family in ICU**

*A 65-year old man, a family head and the owner of a family factory in a small town in the mid-Taiwan, was sent to a medical center for a severe respiratory tract infection. Upon arrival, his condition progressed into ARDS. He was put on a respirator with heavy sedation to sustain life. He never woke up. Despite the best efforts of the HCWs, he died after 42 torturous days on the ICU. The family signed a DNR order and requested an impending death discharge as it is customarily done.*

*Although the family admitted that nothing more could be done to save the man's life, they were quite unhappy over his prolonged suffering in the medical center and the intensive medical measures undertaken on him before his inevitable death. According to his four children, he was a strong and compassionate father, and his death*



*was a traumatic loss to the family. Three months after his death, the sorrow and resentment continued to distress the family members and they alleged that the HCWs were negligent in providing appropriate care.*

To offer a concrete story and help students to make sense of families' experiences and help them to incorporate this new insight into their clinical practices, excerpts from the family's narratives were put in scenarios; such as:

*"The doctors never responded to our practical needs, such as...how much we needed our father to wake up and say something...anyway, he was not awakened and wasn't able to leave us any final word."*

*"He was on tubes, ate nothing except liquid. He was in coma all the time, and had never said a word since he was first transferred here. My father did not want, to be sent here, but we insisted because we believed that he would get better care here and finally got well."*

*"As to the final cause of death, we were still confused. The doctor attributed it to fibrosis of his lung, but we believe that it must have been due to the large infected wound on his lower back that killed him."*

### **Contents of discussions related to end-of-life issues**

Most of time, students focus on how to "do good" in caring for the end life patients and families; which included how to inform and listen to the family, how to express empathy and maintain patients' terminal appearance. Students were guided to clarify the good intent behind DNR. They discussed family's needs for personal dignity in the dying process and those customs and rituals of dying in Taiwan. A narrative PBL

case integrated medical facts as well as contextual factors; situational realities and personal perceptions into scenarios which can effectively provided an overall view of ethical considerations in clinical setting. This narrative played a role to trigger the development for the awareness and self-reflection in defining patient-physician relationship.

## **DISCUSSION**

In this communication, argument has been made earlier that learning of ethics (*Behavior perspectives*) in health care profession is least effective or even ineffective when it is taught in isolation from the societal issues (*Population perspectives*) or professional knowledge (*Life science perspectives*), especially with the conventional passive and didactic instructions. PBL in medical education, being student-centered, integrative and contextual by nature, makes learning with **P**opulation, **B**ehavior and **L**ife science perspectives bonding in one in a holistic way. PBL cases in learner's context also offer the flexibility of integrating ethical issues in any kind of case problems arising over time and crossing professional boundaries.

It is conceivable that students of different levels may have different focus in ethical considerations, thus a well designed scenario should attract sufficient intrinsic interests of some students and bring relevance to their future clinical practice by exposing students to their context of learning, the very basic principle of PBL. Therefore, in the early stage of learning ethics, materials may be extracted from newspapers or real-life stories happen around the learners' living environment to reinforce their appreciation for general principles of ethics. As students progress towards more professionally oriented

learning, case stories are more relative to the real context in profession. To enhance learning in the context of realistic profession life, a well written PBL scenario should be interesting, attractive, realistic, and moreover, stimulating to entice discussion. Furthermore, basic life sciences and ethical principles should both be embodied within the story to enable integration of knowledge. Discussions and debates emerging from PBL scenarios would help develop skills in deliberate and critical thinking and decision making.

During the group interactions under PBL environment, student may exercise their professional attitude by being aware of multiple perspectives, mutual respect and properly communicating their thoughts and ideas to the others. With these qualified written cases, PBL approach may encourage student to seek exploration for the ethical issues presented at each level as well as to promote participation in seeking information from various learning resources. A fitting case story under properly conducted PBL environment may help cultivate a behavior of reflection and internalization.

The primary goals of ethics education are to increase awareness of, and to improve moral reasoning about real-life ethical issues<sup>[13]</sup>. We believe that ethical issues can be suitably incorporated by design in stories<sup>[14,15]</sup>. A concrete scenario can stimulate students to examine their pre-existing belief and to expose to belief different from their own. Following practices, ethical reasoning and critical reflection can become a natural component in their practice<sup>[16]</sup>. In PBL, students may use case problems as triggers to formulate their own learning objectives in ethics, and the faculty may identify learning objectives in advance by creating an effective PBL scenario containing desired ethical considerations. It is reasonable to state that applying ethics issues

through PBL at all stages of professional learning is not only to achieve the goals of university education in achieving the diversity and balance of professional knowledge, skill and attitude, but also to enable medical students to develop self-directed and life-long learning skills in becoming aware of bioethical issues, which are in existence all the time and thus are expected of all health science professionals continually throughout their professional training.

## ACKNOWLEDGMENTS

I am grateful to the unfailing support of Professor C.Y. Kwan for his comments, suggestions and the use of English during the preparation of this manuscript. This work was facilitated and supported by Director of the Medical School, Prof. H.C. Wu, and the Director of the Center for General Education, Prof. S.M. Tzei.

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